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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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DP Tackles Football

Ken Payne, a wide receiver for the Philadelphia Eagles, scores against the Houston Oilers in a preseason game. Univac will help Philadelphia's WCAU-TV prepare biorhythm information on key players for the Eagles and their opponents in the National Football League prior to each game this season in hopes of predicting the results. See story on Page 7.

Longer Zip Code Set; DP Change Seen Costly

By Don Leavitt
CW Staff

WASHINGTON, D.C. — The U.S. Postal Service has announced plans to add four digits to Zip Codes by 1981 to help keep down postage rates, but DPers are beginning to see the other side of the picture — the cost of modifying existing systems to handle the enlarged Zip fields.

Postmaster General William F. Bolger said the decision to go with an add-on system will "substantially reduce costs" within the Postal Service and will improve service by reducing sortation errors and speeding mail processing. He characterized the move as a logical extension of the Zone Improvement Plan which was announced in 1961 and introduced in 1963.

The action is similar to the telephone companies' introduction of area codes, Bolger said, which has enabled the carriers to increase their electronic switching capability, hold down rates and improve service.

The banking system also uses an expanded numbering system to aid in the automated processing and "sortation" of checks, Bolger noted.

The current five-digit Zip Code guides the sorting of letters and other mail to 40,000 post offices, stations and branches. The additional four numbers will carry the process further. Within all five-digit delivery areas, each block of a street, office buildings and companies receiving large volumes of mail will be assigned a four-digit, add-on number, the postal official explained.

That will enable the Postal Service to use optical character recognition (OCR) equipment more efficiently and ultimately allow eight or nine workers to do the work now done by 20, Bolger claimed — but Allen B. Durgin, who runs a small installation in Connecticut, sees another picture.

'Frightening' Image

Shortly after hearing of the plan to expand the Zip Code, Durgin began to research the effect it would have on his current operations, which are based on an IBM System/3 and therefore small compared with many installations with more extensive gear.

Two days after he started, Durgin was still tallying the impact. Yet he al-

(Continued on Page 8)

At Kyoto Conference

Societal Impact of DP Examined

By Ronald A. Frank
CW Staff

KYOTO, Japan — The profound effects computers, communications and microprocessors may have on society were outlined by speakers here last week at the International Conference on Computer Communication (ICCC '78).

Coverage of ICCC '78 continues on Page 6.

In an opening day address to the conference, Dr. Yasusada Kitahara, executive vice-president of Nippon Telegraph and Telephone Corp., said networks can be used to solve problems created by the concentration of population in urban areas. A computer communications network dealing with visual as well as audio information, for example, would rearrange social functions so that employment patterns could change. Such a net would eliminate the need for workers to spend time each day commuting, he said.

This type of network would decentralize and rearrange social functions and could also contribute toward alleviating energy problems, he noted.

Another social effect of technology was outlined by Peter Gassmann of the Organization for Economic Cooperation and Development, who warned that job opportunities, especially for young people, could be greatly diminished as a result of greater reliance on automation caused by the spread of microprocessors.

In West Germany, there have been strikes in the printing and metalworking industries because trade unions fear electronics automation. They believe this will eliminate jobs or downgrade workers' skills, he explained.

Business Mini Weighs 65 Pounds

By Brad Schultz
CW Staff

CUPERTINO, Calif. — If a small TV screen were to sprout from an electric typewriter, the result would resemble the business-oriented minicomputer Durango Systems, Inc. unveiled here last week to compete against systems from much better known vendors.

The Durango F-85 packs an 8-bit microprocessor, read-only memory (ROM), random-access memory (RAM), dual diskette drives, CRT, keyboard and bidirectional printer into one 65-pound unit.

According to a Durango spokesman, the F-85's compactness, multitasking capability and capacity for millions of bytes of storage give the firm "two to two and a half years lead time on the rest of the industry." The desktop system is said to need only 250W of power.

At a purchase price of $13,520, the F-85 is primarily targeted for the end user with a small business, but will also be sold to large businesses for remote job entry applications, according to John M. Scandalios, Durango vice-president of marketing.

The system's ROM holds up to 8K bytes. RAM ranges from 48K to 65K bytes. Diskette storage can be extended from 946K to 1.89M bytes — or, with auxiliary drives, up to 3.78M bytes. Another 10M to 20M bytes of fixed-disk storage is also available, Durango said.

(Continued on Page 4)

IN DEPTH
IN DEPTH

Ill-prepared to deal with Abend dumps, Cobol programmers face 'both a dilemma and paradox' when one occurs. What are the options? See Bernard H. Boar's 'Abend Debugging and the Cobol Programmer' beginning on Page 19.

IBM Snips Witness List Again

By Marguerite Zientara
CW Staff

NEW YORK — In an effort to expedite the judicial process, IBM last week dropped four of its upcoming "competitor" witnesses, bringing to seven the total number of witnesses the firm has eliminated since the end of the summer recess in the U.S. vs. IBM antitrust trial here.

In a robing room conference last week, IBM attorney Alan Hruska said witnesses without "great comprehensive testimony" do not need to use up valuable court time by appearing. The witnesses' relevant points can be brought out by placing their depositions into evidence, he said, adding that it would be a waste of the court's time to call the witnesses since the points have already been made and recorded.

However, Robert Staal, lead government attorney, said the seven recent drops have "severely impacted" the government's discovery process. Of those seven, Staal said, only two have not been deposed by the government (one was deposed by IBM with the government present).

(Continued on Page 8)

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Keeps Users Loyal

Third Parties See 3031 AP as Ploy

By Marcia Blumenthal
CW Staff

While IBM was mum last week on its game plan for the 3041 attached processor (AP) introduced two weeks ago for its 3031 CPU [CW, Sept. 25], third-party dealers were not so reticent.

"With an announcement like this, the user may become paralyzed, which is just what IBM wants. If IBM never sells one 3041, it may have accomplished its objective," Michael O'Connell, executive vice-president of Comdisco, Inc., suggested.

O'Connell and other third-party 3031 vendors see the AP as a marketing tool designed to keep users and potential users from switching to plug-compatible CPUs, which until now have offered better price/performance ratios.

During an informal polling by *Computerworld*, the third parties also said the 3041 is a logical extension to the 30 series and predicted APs for other models in the line. Many consider the 3031 a reworked 370 and pointed to the similarity between the AP strategy for the 3031 and the 370/158.

However, none of the dealers surveyed said they had experienced demand for increased capability for the 3031.

An IBM spokesman said the introduction of the 3041 was prompted by an assessment of customer needs. However, he declined to answer any further questions, stating it was the company's practice not to comment on specific business plans.

Ploy to Confuse Market

Another vendor, which asked not to be identified, said IBM will continue to deluge customers with product announcements to confuse the marketplace. This tends to make customers avoid decisions to switch equipment manufacturers.

"Any time IBM can get a customer to wait, it is coming out ahead," the vendor maintained.

Looking at IBM's move from the customer's perspective, John Greene, manager of market planning for Computer Systems of America, Inc., said of the 3041 that "it's not a lot to pay for the increase in power and performance."

Green declared that IBM is on a "line-holding expedition" and is trying to give its customer base the same kind of throughput offered by the plug-compatible CPU makers, like Amdahl Corp. with its 470V/5.

Reinforcing the opinion that the 3041 is a marketing tool, Green noted that if the 3031 were compute-bound, then the 3041 would offer a solution. However, he said, computers on the whole are I/O-bound, and one way of making them appear something they are not is to increase the performance.

"If you look at what competitors are claiming, the Amdahl V/5 is a better performer than the 3031 alone. But with the 3041, the 3031's performance is knocked above the V/5 or the V/6," Green continued.

Schedule Balancer

Green rejected the view of Robert T. Fertig, vice-president of Advanced Computer Techniques Corp.'s Technology Analysis Group, that the 3041 is a way of balancing IBM's production schedule.

Fertig, an avid IBM-watcher, suggested that some customers who would have had to wait two years for 3032s or 3033s will now consider the 3031 with an AP rather than endure delay. Green countered with the opinion that IBM is coming close to the end of its delivery problems, adding that he does not consider it IBM's style to promote one of its products at the expense of another.

Fertig concurred with others who said IBM introduced the 3041 as a way of warding off plug-compatible CPU competition.

Comdisco's O'Connell indicated he really wasn't surprised by the 3041 announcement. "IBM is going to milk the machines that are in the field as long as it can, until it has to do something dramatic," he said.

No Renovatiuns

Aside from the assessment that the 3041 is a competitive answer to plug-compatible machinery, William Grinker, exective vice-president of American Used Computer Corp., said the 3041 will give 3031 users more capability, avoiding plumbing and electrical renovations which could cost a user up to $250,000 in installation preparation if he has no upgrade options other than the 3032 or 3033.

Grinker speculated that the AP will have a positive impact on the market for used 370/158 mainframes because the 3031 with the AP is a natural upgrade from the 158's similar architecture.

Joseph Kelly, national sales manager for Randolph Leasing Co., agreed with Grinker, saying the 158 AP user can achieve better price/performance with a 3031 AP configuration than by migrating to a 3032.

Marketing staff of Itel Corp., which introduced the AS/5-3 AP at the same time IBM introduced the 3041, were away at a meeting and were unavailable for comment.

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Ristol Turns Himself In; $600,000 Still Missing

By Tim Scannell
CW Staff

LOS ANGELES — Arne Ristol, a 52-year-old self-employed bookkeeper accused of stealing nearly $1 million mistakenly credited to his bank account, will remain in custody here while police ponder the riddle of what happened to more than $600,000 of the money.

Ristol is scheduled to appear this week in Los Angeles Superior Court to face charges of grand theft in connection with the disappearance of $927,288 accidentally deposited into his account at the United California Bank (UCB). He surrendered to authorities last month, pleaded innocent and is currently being held on $100,000 bail.

Although the bank has refused to elaborate on the nature of the crime, police investigators speculated a keypunching error may have been responsible for the accounting mistake which occurred in early June. The bank reportedly discovered the error when the true depositor, a local real estate company questioned the bank on the whereabouts of its money.

According to a bank spokeswoman, Ristol drained the account through a series of small withdrawals within the six or seven weeks following the error. The account was apparently depleted of everything except $1,100 by checks written to an unknown number of people.

"All we know is that a dozen checks have been written and that there is a civil suit against several people," UCB's Lerner said.

Lerner declined to comment on why it took UCB nearly three months to uncover the error or why the bank itself failed to notice the discrepancy.

"Every banking system has a series of checks and balances," Lerner said, "and . . . if in fact they fail, they would fail more often were they public information."

Investigators initially believed Ristol had fled to Florida but learned, upon his surrender, that he had traveled to Europe on "a long-planned vacation," Eugene Andres, Ristol's attorney, said.

Ristol purchased a one-way trans-Atlantic ticket and left the U.S. on Aug. 9, the same day the California bank discovered the error in his account, according to Kellogg Chan, the deputy district attorney assigned to the case.

Ristol reportedly flew from Los Angeles and arrived in Stockholm via Copenhagen and Helsinki. While in Europe, he allegedly laundered the funds by using what investigators believe to be a complicated series of deposit and withdrawal maneuvers between European, American and Canadian banks.

According to bank officials, $750,000 of the booty was channeled from the UCB account to a Montreal bank by a Canadian accountant who subsequently denied having any knowledge that the money was stolen. The money was then withdrawn from the Canadian account and transferred to the Cantrade Bank in Zurich, Switzerland.

A portion of this money, approximately $150,000 was later returned to the U.S. and deposited into the accounts of two companies in which Ristol allegedly had an interest — Strawberry Valley Estates in Nevada and Strawberry Valley Development Co. in Arkansas. UCB authorities have filed suit seeking to freeze the money, which they believe was used to pay mortgages and liens on property owned by at least one of the companies.

Ristol used $100,000 of the well-traveled money to pay a debt owed to a business associate and an additional $38,000 to purchase stock in the Western Empire Corp., a company in which the associate is a major stockholder, Daryl Hanson, Ristol's civil attorney, said. UCB officials said a small portion of the $38,000 has been located and frozen pending further investigation.

To date, only a third of the $927,288 has been located and a very small percentage has been returned, according to Donald Crivellone, UCB's administrative vice-president. "We have gone into court and gotten temporary restraining orders on less than $300,000, but we have recovered almost none of it," he added.

Meanwhile, Ristol's attorney has asked for a reduction of the court's $100,000 bail, noting that his client had elected to surrender and that he has no prior convictions.

"We aware of where he was and it was just a matter of time before Interpol picked him up," Chan declared.

Small Business System Weighs 65 Pounds

(Continued from Page 1)

F-85 software includes a real-time executive operating system; Isam, random and sequential file access; an Extended Basic compiler/interpreter; various applications packages; and packages for emulating Ascii and IBM 2780/3780 communications protocols.

Through asynchronous serial ports, the F-85 can accommodate up to four additional terminals operating at rates up to 1,200 bit/sec. Multitasking is allowed, Durango stated, putting the system's memory access time at 250 nsec.

An integral modem with auto-answer capability and RS-232C 20mA current loop and IEEE 488-1975 parallel interfaces are provided as well as a high-speed serial synchronous or asynchronous interface operating at speeds up to 9,600 bit/sec.

The CRT displays 24 lines of 80 characters each and the printer yields a 9 by 9 dot matrix at 165 char./sec, Durango stated.

Durango product manager Galyn Prescott demonstrates the F-85's portability.

The F-85 can store far more information than the IBM 5110, which does not have multitasking, Scandalios claimed. Neither Qantel Corp.'s Model 210 nor Wang Laboratories, Inc.'s models 1100 and 2200 have the F-85's range and flexibility of storage, he continued, adding that neither can accommodate fixed disks.

He also rated the F-85 over Digital Equipment Corp. and Data General Corp. OEM business systems, including the DEC Datasystem 78, 308, 310 and 320 and DG's CS20 through CS40 and Micronova.

The F-85's Basic is said to permit I/O formatting, external subroutines, string and array processing and 16-bit integer and floating-point decimal arithmetic with 14-digit precision. The language offers an interactive editor.

Application software includes general ledger and accounts payable programs. Packages tailored to user needs are also available, the firm said.

Scandalios seemed to take special pride in the F-85's compactness. "What we've done is design a product that integrates the peripherals and the processing mechanisms, using the printer as the base," he said. "The resulting product has 40% of the parts of a conventional system and uses half the energy — roughly that needed by two ordinary lightbulbs.

"The IBM 5110 . . . is a conventional three-box system. It has a processor with a small display screen and a separate printer and a separate package to house the two diskettes. That weighs 234 pounds, he continued.

"From a design standpoint, the product is very significant to the industry. I think it's going to show the way for all future designs of systems requiring a printer as well as diskette storage, processor and CRT. Why should you have three boxes, anyway?"

Durango will perform all San Francisco-area maintenance. Service for the rest of the nation will be done by California Computer Products, Inc.

Durango is located at 10101 Bubb Road, Cupertino, Calif. 95014.

What Is Durango?

CUPERTINO, Calif. — Durango Systems, Inc. was founded in August 1977 by three veteran computer industry executives who believed they had "a better computer."

The three executives are George E. Comstock, John M. Scandalios and Charles L. Waggoner, who founded Diablo Systems, Inc. and then sold it to Xerox. The trio envisioned a computer that would marry the significant increases in the capability of semiconductors with the similar advances in random-access storage devices and serial printers.

That computer is the Durango F-85, unveiled here last week. The F-85 will enter the market in late 1978 with full production scheduled for 1979.

Comstock is the president of Durango; Scandalios, the vice-president for marketing; and Waggoner, the vice-president for engineering.

Initial financing for the firm was accomplished in September 1977 with a $1.5 million equity investment made by a group led by Sutter Hill Venture and Citicorp Venture Capital, Ltd. A planned second round of financing — an added $2.5 million equity investment — was completed last July.

The original investors were joined in the second round by Genstar Ltd., a Canadian multinational listed on the New York Stock Exchange; Kleiner, Perkins, Caufield & Byers; and Mayfield II.

Durango Systems has also arranged a bank line of $800,000 to acquire capital equipment.

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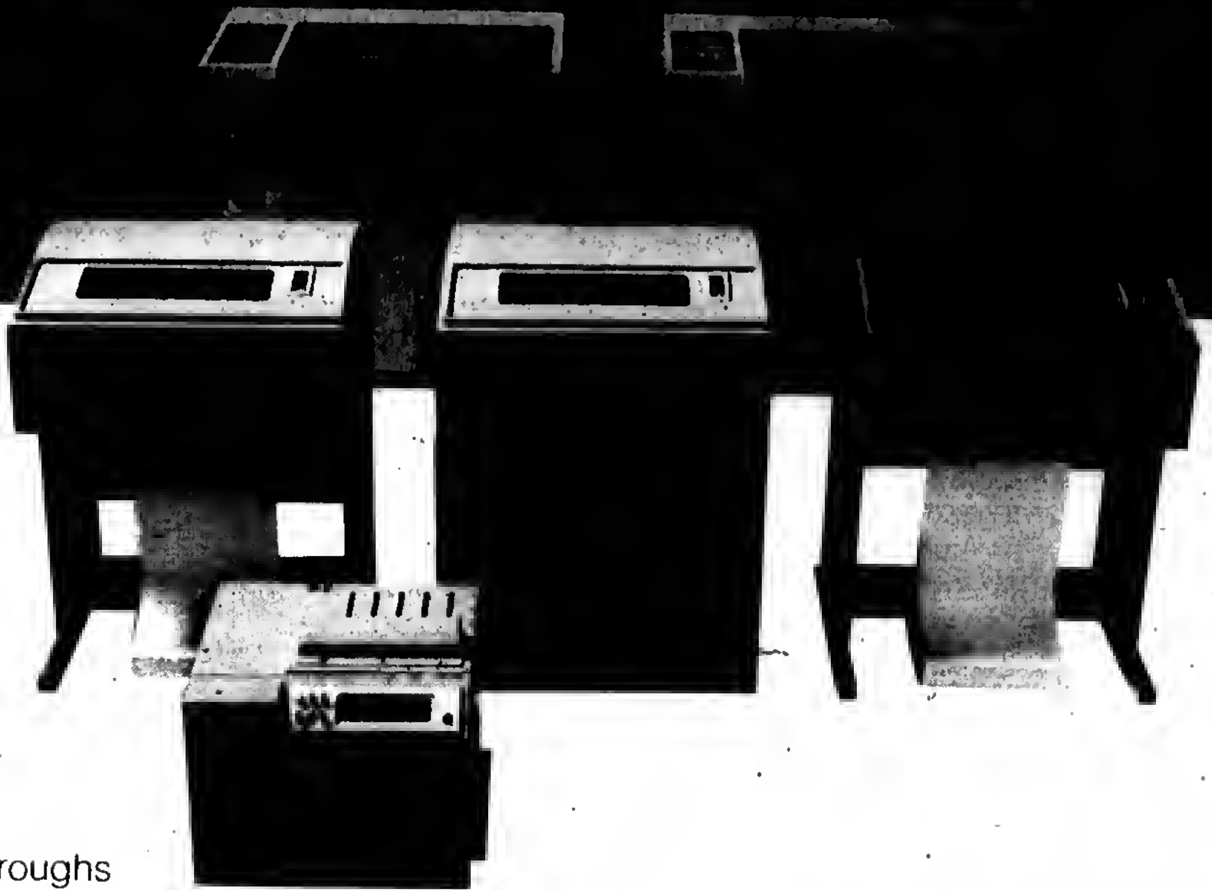

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Dependence on DP Total, Keynoter Declares

CW at ICCC '78

By Ronald A. Frank
CW Staff

KYOTO, Japan — In a few years the bulk of the world's information will be available in computer-based, computer-processable form, and some classes of information will not even exist in any other form, according to Dr. Keith A. Uncapher of the University of Southern California Information Sciences Institute.

Delivering one of three keynote speeches at the fourth International Conference on Computer Communication (ICCC '78), sponsored by the International Council for Computer Communications at the Kyoto International Conference Hall here last week, Uncapher said the dependence of business, industry and government on the computer is virtually total.

Even partially automated systems will tend to make manual information systems disappear, he added, and soon no options but those systems-driven computers will exist.

The rapid progress now being made in digital communications will render obsolete the distinction between communications and computing, between postal and telegraph communications and between terrestrial, radio and satellite systems, Uncapher predicted. Inevitably, data, voice, graphics and facsimile all will be transported via common digital communication links managed and controlled by computers.

In this environment, the personal terminal will increasingly be used to provide the individual with access to information from the outside world. The personal terminal will be used primarily for communications rather than computing, Uncapher explained. Arpanet users already utilize an electronic mail system to share resources and collaborate on-line.

These users find asynchronous nonreal-time communications geared to the personal convenience of both parties and the informality of communications via interactive terminals to be productive for scientific uses. These concepts will be extended into nonscientific domains to open new forms of communications for most users, he said.

The personal terminal will become the common access method for electronic mail and will be used in such applications as banking, shopping, purchasing and billing, Uncapher forecast. The telephone, having become integral to the terminal, will be treated as an alternate path when real-time communications are required, he said.

People to People

What will emerge will be networks of terminals linking people to people, to information sources and to private, corporate, national and international networks, he predicted. The personal terminal will be the instrument that supplies users with information processing and related communications for voice, numerical information and facsimile plus other forms, he said.

Examples of the emerging services were described by Masaya Yamauchi, managing director and director general of the Research and Development Bureau at Nippon Telegraph and Telephone Corp. In Japan, push-button telephones can be used to provide calculation services and reserve seats on trains. In addition, the Prestel Service in the UK and Captain in Japan provide users with access to data bases at DP centers via CRT terminals.

The next generation of services will include an integrated system of computers and communications. This was described by Yamauchi as the Integrated Services Digital Network (ISDN), which will have physical and logical as well as service aspects.

The physical aspects will include phone lines, switches and terminals. The logical aspects will include the tariff, protocol and "bearer rate," while the service aspects will combine voice, telegraph, data and video, Yamauchi predicted. ISDN will be able to meet a wide spectrum of demands from the general public as well as business users, he added.

Meeting Attended by 900

KYOTO, Japan — The International Conference on Computer Communication (ICCC '78) here last week was attended by more than 900 delegates who represented 30 countries and heard 118 papers on a mix of both technical and societal subjects.

At the opening session, Peter Jackson, president of the International Council for Computer Communication, the conference sponsor, said earlier meetings had concentrated on technical issues associated with building packet-switched public data networks, but applications are now being stressed.

"In the past, we were excused for playing with our network toys, but now it is high time we emphasized the practical uses of these networks," according to Jackson, who is with Bell Northern Research in Canada.

The ICCC conference is held every two years.The 1980 meeting is scheduled for Atlanta, with AT&T acting as the host organization.

Nations Seen Uncertain on Privacy Action

By Ronald A. Frank
CW Staff

KYOTO, Japan — There is much concern in the U.S. and elsewhere that the adoption of international privacy protection criteria, in whatever form, could disrupt international economic activity. At the same time, the concern for protection of personal data is genuine and motivated by deeply felt political and social values, according to William L. Fishman, deputy associate administrator for policy analysis and development at the National Telecommunications and Information Administration (NTIA) in Washington, D.C.

In a paper prepared for delivery at the International Conference on Computer Communication (ICCC '78) and presented by another conference participant, here last week, Fishman cautioned that there is "some uncertainty" about the need for international action, the form it should take, the motives behind the call for such action and the ultimate implications. It is commonly recognized among free societies in the international community that to receive and impart information is a basic right.

But even in the U.S., such rights are not absolute and must be balanced with regard for national security, public health, public morality and similar concerns, the paper said.

A question that may be related to the free flow of information concerns the cost and availability of telecommunications facilities. In this regard, the European postal, telephone and telegraph authorities (PTTs) have for a number of years "been watching with alarm" the growth of private-line services and networks.

The telecommunications authorities appear to regard these nets as "incursions on their state-granted monopoly and something which should be minimized." As a result, the PTTs of Western Europe appear to be trying "to reduce customer use of private lines both by making them less economic and by offering new public data networks tailored to the special needs of the data [communications] community," Fishman said in his paper.

A recent contribution by the Italian telecommunications authorities at a meeting of the Consultative Committee on International Telephone and Telegraph (CCITT) "epitomizes these pressures," Fishman said. Pressures have been brought to bear on private-line users to abandon their current facilities and "surrender themselves . . to the monopoly facility and pricing control of the PTT," he wrote.

Excessive prices, just as much as privacy protection rules, could function as a barrier to international data flow. This may have implications for the privacy question but it certainly relates to the broader issue of transborder data flow, he said.

Despite the international activity and the potential threats posed, many people, particularly in the U.S., are not yet convinced the problem is big enough, or widespread enough, internationally to warrant the major step of broad international action, Fishman wrote.

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Purchase Prices Not Affected

System/3, 32, 34 Get Rental and Lease Hikes

By Don Leavitt
CW Staff

ATLANTA — IBM's General Systems Division last week announced price increases for several of its products including the System/3, the System/32 and the System/34, as well as price adjustments for certain maintenance services.

Rental and lease prices ~~for~~ the products will increase approximately 2% to 5% as of the first of next year; purchase prices are not affected, according to a spokesman.

Also announced were adjustments to "most" minimum monthly maintenance charges, with increases of up to 20% and reductions of up to 10%. While increases will not take effect until January, reductions went into effect as of Oct. 1.

Since the Series/1 minicomputer and the 5100 and 5110 desktop systems are available only through purchase, they were not affected by last week's announcement, the spokesman noted.

To illustrate the impact of the changes, he said a System/13 Model 4 has been available for $659/mo under a rental plan or $599/mo under lease; these costs will be $691 and $628, respectively, under the repricing. Maintenance for these units will rise from $160/mo to $168.

In the Model 6 grouping, the configuration with 8K bytes of Mosfet memory will move up from $741/mo to $778 rental and $674/mo to $707 under a lease plan. The 12K-byte system, which was $888/mo or $807 depending on whether it was rented or leased, will be available for $932/mo or $847, according to the spokesman.

Maintenance charges will not be changed for "most" Model 6s, he added.

One exception to the pattern of increased or unchanged maintenance charges occurs in the System/3 Model 8 options. Support for the 2074 Binary Synchronous Communications Adapter dropped $5/mo from $68 to $63.

On the other hand, rental for the device will jump from $329/mo to $344 while leases face an increase of $15/mo from $299 to $314, the spokesman acknowledged.

The spokesman declined to continue the countdown through other products affected since the list is long and the details are only important to those with specific patterns of processor, peripherals and options.

IBM said the price adjustments "reflect normal business reviews."

CPU Tackles Football Team's Biorhythm Data

PHILADELPHI. — A mainframe maker is cooperating with the Sports News Department of WCAU-TV, Channel 10 here, to provide computerized information on biorhythms for key players on the Philadelphia Eagles football team and their opponents during the current football season.

The biorhythm information is being provided to WCAU-TV's viewing audience on the Dick Vermeil show at 12 noon on Sundays immediately prior to each game.

Using the players' birth dates and the date of the game, a Univac 90/70 computer at the DP manufacturer's world headquarters in Blue Bell, Pa., charts selected players' physical, intellectual and emotional ups and downs. According to the biorhythm theory, a person's good or bad days are directly related to the ups and downs of his physical, intellectual and emotional cycles.

The physical cycle is 23 days, the intellectual is 33 days and the emotional 28 days. The cycles are plotted like sine waves on a graph; when the curve is moving up toward the line, the biorhythm promises a good day.

Theoretically, if a person is above the 0 line physically, he should have a lot of energy; if he's above the line intellectually, he should be able to think faster and more logically; and if he's on the top emotionally, he should be more creative and cheerful.

When the curve drops below the zero line — toward the -1 line — the opposite happens. The person is likely to be accident-prone, and a number of things can possibly go wrong. The critical day is when the curve crosses the 0 line.

'Biorhythm Edge'

Prior to each game, data on key players for the Eagles and the opposing team is fed into the computer via a Uniscope 200 CRT terminal. A special program then goes to work on the data and produces the ups and downs of the various players on the terminal screen for the particular day of the game. This same information can be produced in hard-copy form.

The resulting information for each team's key players is then compared and analyzed to which team has the "biorhythm edge" and is most likely to win..

A similar program was operated last year for games played by the Minnesota Vikings. The predictions turned out to be 95% accurate.

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IBM Doesn't Control Market, User Testifies

By Marguerite Zientara
CW Staff

NEW YORK — "IBM is a strong force in the computer field — a force to be considered — but it is not a controlling force in the field," John L. Jones, vice-president of management information systems for Southern Railway Co. (SR), testified recently at the U.S. vs. IBM antitrust trial here..

Jones, IBM's fourth user witness, also said he feels that IBM is not a "dominant force" in the DP marketplace and specifically not at SR's central DP site in Atlanta. Jones said IBM cannot cause SR to install additional IBM equipment, upgrade present IBM equipment or keep SR from putting additional processing applications on its Data General Corp. equipment.

He further claimed that because of what he characterized as IBM's "centralized approach to applications systems design and implementation" SR has spent money that could have gone toward a larger IBM central site machine on smaller DG machines and processing in the field instead.

SR's central site in Atlanta has four IBM 370/158 CPUs, but SR's large railroad car switching yard in Sheffield, Ala., uses five DG Nova 1200 minicomputers for its inventory control and process control functions. According to Jones, who designed the system, this was a revolutionary idea when it was implemented back in 1973, before anyone had ever heard of "distributed processing."

The great success of SR's DG-based system and the subsequent proliferation of distributed processing systems throughout the DP community has led Jones to believe that IBM had better change its orientation from a centralized systems design and implementation approach to a distributed processing approach if it wants to keep its customers, he testified.

Much-Debated Definition

During his two weeks on the stand, the railway vice-president also addressed another key issue in this trial — the definition of a "general-purpose computer." According to Jones, a general-purpose computer is a system comprised of "input equipment, output equipment, storage, arithmetic circuitry, controls [and] memory and that can store and execute internally stored programs."

Under government cross-examination, he discussed possible alternatives to SR's IBM-equipment-based central DP site and his reasons for not choosing those alternatives in 1974, when SR acquired the 370/158s.

Jones' major reason for buying 370/158 processors, he said, was their compatibility with SR's existing 360 network. He testified that he knew of no plug-compatible alternatives at that time outside the IBM family of computers.

When asked why SR never considered or evaluated 158-equivalent equipment from Honeywell, Inc., Univac, Burroughs Corp. or Control Data Corp. for the 1974 purchase, Jones said that since he had never heard that those vendors' products were plug-compatible, he did not consider them plug-compatible and therefore did not evaluate them.

In a number of cases, Jones said, he chose to acquire IBM peripheral equipment instead of other vendors' because he was confident it would be successful in SR's DP environment and he did not want to make errors that would cost his company money instead of saving it. He even stated at one point, "My job is not to save money, but to make money" for the company.

The user witness said that on occasion, he has signed performance agreements with various companies, requiring that certain performance levels be demonstrated prior to payment by SR. If the levels were never met, the equipment would be removed without payment to the vendor.

Jones said he never felt it necessary to sign such an agreement with IBM because the firm had always been "extremely good" in the areas of delivery, performance, service and support.

IBM Pares Its List of Witnesses Again

(Continued from Page 1)

The sudden acceleration of the case schedule leaves the government unprepared for upcoming witnesses. "We are almost out of deposed witnesses at the moment," Staal said.

The issue raises "another serious problem" for the government: The witnesses have not been cross-examined. The deposition process was devoted to finding out what the witnesses planned to say on IBM's behalf and therefore the depositions represent only a partial record and one that is "very much slanted in that sense for IBM," according to Staal.

Hruska, however, stated that whenever a deposition is taken, there is the possibility the witness's words will be put into evidence "for one reason or another." He also said that if the government wants to further examine a witness, it is free to call the witness in its rebuttal case.

In a second robing room conference, Staal proposed that there be a minimum 10-day period between the deposition of a witness and his appearance in court. Hruska would not agree to what he termed a "straitjacket" rule, but he did agree to try to determine as soon as possible which witnesses will definitely appear in the next two or three months and, in the case of dropping witnesses, to notify the government as soon as possible.

Although the government is momentarily inconvenienced, during its direct case it dropped witnesses in much the same way as IBM has just done. As Hruska pointed out in the robing room conference, IBM deposed 77 witnesses on the government's initial witness list who were never called to testify by the government.

The IBM witnesses dropped last week who were deposed by the government are George E. Mueller, chairman and president of System Development Corp.' Walter R.T. Witschey, president and treasurer of the Computer Co.; Thomas I. Harris, president of Optical Research Associates; and Russell C. DuBois, vice-president of operations for Omron R&D, Inc.

Nine-Digit Zip Planned

(Continued from Page 1)

ready could foresee that 40 disk files would require expansion, 145 programs would have to be changed and recompiled and 81 job control procedures would have to be revised.

Beyond that, Durgin said six input documents would require changes — and reprinting, six data entry functions would require modification and 40 conversion programs — to perform the file alterations — would have to be created, tested, debugged and then thrown away.

His estimates of the time needed and the costs associated with such a wholesale conversion led Durgin to visualize the effect of the change on all the computer systems installed throughout the U.S. The image was "frightening," he said.

He also found the image irritating: "We in the DP field realize more than others that change is an opportunity. We also realize that a sound blend of good business judgment needs to be applied together with a realistic consideration of the degree of success, effect and acceptance of such a change.

"But when we consider the cost of past changes instituted in post office automation and compare the benefits derived in terms of improved service, the results are all too clear."

Durgin questioned how much thought and discussion had gone into the proposal to enlarge the Zip Code, weighing the cost to the postal customers against the potential improvement in service.

For his part, Bolger noted that precise figures on savings that may accrue from the use of add-on Zip Codes have not yet been developed since they are dependent on such variables as mail volume, the inflation rate and labor costs. But he termed the potential "highly significant."

Implementation plans call for the adoption of rules, assignment of the additional Zip Code numbers and initial acquisition of OCR equipment by early in 1981. By 1983, the Postal Service expects the transition to the system to be complete.

One of the weaknesses in the existing system of distributing mail, according to Bolger, is that the areas served by letter carriers are often changing as new homes are built and mail volume increases. With changes, postal distribution clerks have to relearn the streets and house numbers served by a specific carrier route.

Initially, the primary users of the nine-digit Zip Code will be business mailers, customers who generate large volumes of computer-printed addresses and distribute preprinted reply envelopes.

2nd edition "Winning Proposal"

Mercury details new guidelines for gov't. unsolicited proposals

In response to the recent policy shift by OFPP on unsolicited proposals, Mercury Communications has released a new updated edition of *How to Create a Winning Proposal*. First published by Mercury in 1976, *"Winning Proposal"* rapidly became an international standard guide for use in both government and commercial proposal efforts. It is currently being used by over 15,000 research, manufacturing and service companies as well as numerous government, military and civilian agencies.

The new edition features updated information on requirements for preparing and submitting unsolicited proposals to Uncle Sam. Included is an explanation of the new government-wide regulations concerning acquisition, contracts and awards. In addition, the book details the recommended standard format for unsolicited proposals now accepted by all government departments and agencies. It also provides: a list of common evaluation criteria generally applied to unsolicited proposals, information on how to identify and reach the right target for your proposal, and excellent guidelines for negotiating the best possible contract or award for your particular project.

Copies are available prepaid from Mercury Communications Corp., 730-P Mission St., Santa Cruz, CA 95060. $49.95 (check or money order) includes shipment. In Calif. add $3.00 tax. Master Charge and VISA orders accepted. Please state card no. and exp. date. C.O.D. orders call 408/425-8444.

Conference Scheduled for Oct. 16-19

Info '78 to Stress Future Management Strategy

By Tim Scannell
CW Staff

CHICAGO — The manager of tomorrow, like the mythical wizard in the rainbow city of Oz, must be all-knowing and all-seeing — or ultimately face the ruin of his corporate kingdom.

Consequently, how well an executive uses information in the 1980s will dictate whether a company's army of machines and computers act beneficially or as juggernauts, crushing both profit and productivity, according to William Reidy, executive vice-president of technical services for Kraft, Inc.

Reidy and nearly 200 other speakers from industry and government are scheduled to address the problems and strategies of information management at the upcoming Info '78 Exposition and Conference. The four-day meeting, slated for Oct. 16-19 here at McCormick Place, is expected to draw more than 15,000 participants.

DP management and, specifically, a manager's role in the information-dependent corporate world of the 1980s will be one of the many areas focused on during the conference.

"First of all, a manager must have a good grounding in the information systems technology," Reidy emphasized. "He must also place himself above that and really understand the key factors in making a business operate more productively."

Flood of Information

Alluding to his conference topic, "New Opportunities for the DP Manager," Reidy stressed the manager's increasingly difficult job in keeping his head above the rising flood of technical information.

"Understanding what makes a business operate and why it has been successful in the past is crucial," Reidy said. "The manager has to understand where in the business are the areas of sensitivity that will contribute" and he must strive to "go beyond the normal kinds of things we've done with computers in the past."

The key to managing a complex organization, Reidy continued, is information. "In the past, organizations have followed communications or information lines. But as we operate in a more and more complex world of the future, the ability to adapt corporations within these lines will rely more heavily on a manager's ability to conform the information or communications channels to meet changing needs."

Another scheduled speaker at the conference — John Reece, vice-president of Booz Allen & Hamilton — believes information goes beyond being simply a key and is, in reality, a tool.

The 1980s may be the first decade "that we will enter as information professionals where the technology is probably measurably ahead of our ability to use and apply the [informational] tool."

In the past, Reece observed, corporations were always concerned with getting a bigger or faster disk drive or a cheaper, more powerful mainframe. "Those things are still important," he noted, "but I think they are now secondary to the issue of how we get the [informational] tool to work and how we get top management and operations to use it effectively."

Reece and his colleague, Michael McLaughlin, an associate with Booz Allen & Hamilton, see the 1980s as the "window" to the dawning of the informational age. In their speech at the conference, they will investigate information's impact on corporate productivity and performance.

"Most of us think of productivity in terms of the number of keystrokes [a person] makes every day," Reece stated. "But the true entrepreneurial vice-president's world is a whole lot bigger than that."

The information function in the 1980s, McLaughlin remarked, will directly affect productivity in three key areas: human resources, capital resources and the use of natural resources. "I don't think there's any doubt in our minds that if we don't do anything [structurally] in this country as we move from an industrial society to an information society, our competitiveness will be shot to hell," he said.

Other Sessions

Info '78 will also include sessions on trends in computer architecture and planning for disaster recovery as well as meetings on DP auditing, minicomputer systems and data base administration, a conference spokesman pointed out. The conference theme, "Strategic Planning in the Information Age," will cover DP, micrographics, word processing systems, electronic mail, records storage and retrieval and office automation.

Registration fees for Info '78 are $225 for the full four days, $80 for one day and $45 for a half-day. Further information on the conference can be obtained from its sponsor, Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

Since hotel space is limited, those interested in Chicago accommodations are advised to make reservations through Info '78's Housing Bureau, c/o Chicago Convention and Tourism Bureau, 332 S. Michigan Ave., Chicago, Ill. 60604.

To COBOL programmers who want to enjoy their work more

Should you enjoy your work? I think so. And programming has the potential to let you enjoy it. It can be challenging, exciting, at times just plain fun. But all too often, it's anything but enjoyable.

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No, programming under those conditions isn't fun. It's disturbing, discouraging, sometimes frustrating to the point of tears. But it doesn't have to be that way.

A partial solution

Quite frankly, I don't think anyone can remove all of the frustrations of programming. No matter how well your shop is run, there are going to be system problems that confound your test runs for days at a time. There are going to be schedules, often unreasonable ones. And there are going to be late specification changes. You can't change these conditions, but you can change the way they affect your work.

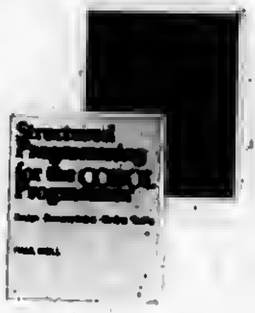
Our solution is a better system of program development. By properly designing your programs, even major changes in program specifications will have only minor effects on your programs. By adopting more effective methods of program documentation (the flowchart is dead), you will have less trouble with program maintenance. By using better methods of design, coding, and testing, you will have fewer bugs when you start testing and they will be easier to find and correct. And by having better control over all phases of program development, from design to testing, you will have less chance of getting behind schedule.

If you're interested in a better system of program development, I'd like to recommend a couple of books by Paul Noll, a software specialist and training manager. Paul is one of the top COBOL experts in the country, and he has some unique ideas about program development. After experimenting for several years with the latest programming techniques—the ones associated with structured programming—Paul decided that no one had developed a practical way to implement them. So he developed his own methods. His methods are now presented in two books written specifically for the experienced COBOL programmer.

30-day trial and unlimited guarantee

First, take up to 30 days to review the books without paying anything. Second, if you don't enjoy your work more as a result of using Paul's methods, feel free to return them for a full refund no matter how long you've had them.

What the books do



The first book: *Structured Programming for the COBOL Programmer*, presents a complete system for developing COBOL programs. It includes top-down design, structured module documentation, structured coding, and top-down testing. To use Paul's methods, you won't have to learn a new vocabulary and you won't be overwhelmed by theory. On the contrary, I think you'll be delighted by the straight forward simplicity of Paul's methods.

The second book, *The Structured Programming Cookbook*, is a reference manual for the development of new programs. It gives standards and guidelines for all phases of structured program development. And it gives complete design, documentation, and coding for four programs that represent the four major classes of business problems. These programs are intended to cut down the repetition in your programming efforts. When you develop an update program, for example, I think you'll find that you can use the structure chart, some module documentation, and even some of the COBOL code from the model update program in the cookbook. This frees you from the tedious aspects of program development and lets you concentrate on the more challenging aspects.

If you are already developing structured programs, I'm convinced that Paul's books can help you to improve your methods so you'll enjoy your work more. And if you haven't yet been introduced to structured programming, you've got some exciting reading ahead of you. I think Paul can show you how to minimize the frustrations of programming while you maximize its challenges.

What other programmers think

Here are some excerpts from letters we've received from programmers throughout the country:

"After reading your books for two hours, I was convinced that I never knew how to write a good COBOL program, and I promptly became a convert."

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"My project manager wanted me to learn structured programming, so I read your book and the first structured program I wrote, albeit simple, ran the first time, like a champ!"

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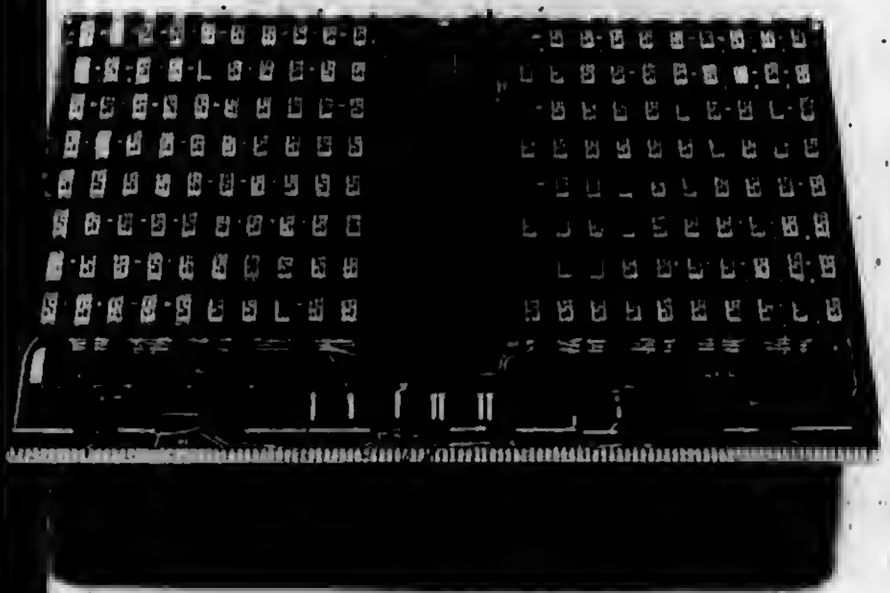

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Students Help County Out of Inventory Bind

By Ann Dooley
CW Staff

LANCASTER, Pa. — Faced with indefinitely postponing development of a much-needed automated inventory control system because of a tight budget and limited staff, the Lancaster County DP center took a chance on an overlooked resource — student DPers from a nearby college. And the gamble worked.

"I'd still be sitting doing pen-and-ink logging on a system hopelessly outdated if it weren't for those students," James Burie, county purchasing agent, admitted.

Burie decided it was time to do away with the outdated inventory record system when the purchasing department moved to new offices last year. With no apparent means of accomplishing the goal, he discussed his problem with colleagues and realized that qualified help — computer science students studying at nearby Millersville State College — was close at hand.

Thomas Houser, director of computer sciences at Millersville, was enthusiastic about the idea since it would be a chance for his students to obtain business experience, so he took the proposal to the school's class in business systems analysis and found four volunteers.

Since there was no money in the budget to pay outside programmers, this was the perfect solution, according to Burie. The inventory system had been sorely needed for a long time but there had just never been enough time to develop it, he noted.

Savings of $6,000

And instead of putting an additional strain on the budget, the student programmers saved the country an estimated $6,000 in programmer and machine time. The system still saves staff time every time it's put to use, Burie pointed out.

Before the students began work, Burie hired a part-time employee to identify and catalog all county office equipment worth more than $25. This included anything from furniture to water coolers and amounted to more than 10,000 separate items, he said.

The raw data, along with an outline of the county's needs and requirements, was turned over to the students, who then took over and set up the program. They spent about four months on the project, working in their free time and even during vacations, according to Burie.

The students used the college's Univac 70/3 to develop the program and subsequently converted it to run on the county's Univac 90/30. The conversion was fairly easy since the volunteers were familiar with the county's DP equipment and the systems were compatible.

The foursome spent their last two weeks on the project at the county DP center, testing and debugging the program to make sure it would run on the 90/30 without any problems.

Although the students weren't paid, they received a grade and credits for the project. All four were "really great to work with," according to Burie, who added that one of the students came in on his summer break to work on the project.

All were enthusiastic and "kept me on my toes," he said.

Fresh Approach

In many ways, those students were more qualified than some working DPers since everything was fresh in their minds, he noted. They were also closely supervised by their professor, who allowed them to make mistakes but made sure they corrected any problems.

All the work was done exactly by the book, he added.

Burie hopes to work on other projects with students from Millersville. One task he has in mind is automating the purchasing operation to avoid duplication in buying and to reduce the workload.

From the students' point of view, the project was a real learning experience — much better than textbooks, they all agreed.

"I enjoyed getting involved," Bruce Miller, one of the programmers said, adding "there were some headaches, but the end result was that it really worked, which gave us all a lot of satisfaction." It was also worthwhile working on a business application rather than a purely academic system.

With the new system, it is now possible to "have a finger" on all the equipment at any location in the county, Burie said. When a new official moves into an office, "we can now tell exactly what should be in that office. This way we have some control over the equipment," he noted.

It is also possible to move equipment around, where it is needed and thus avoid duplicate purchases, he said.

Lancaster County's system includes the 90/30 with 190K of memory, two tape drives, four disk drives, several keypunch machines and a Univac 0773 printer.

The system is also used to keep tabs on bench warrants and concealed weapons for the sheriff's office, to prepare budgets and to provide records for the Children's Bureau and the County Home for the Aged. It also handles fines; voter registration lists; interim taxes; jury selection; county payroll; and personal property, real estate and school taxes.

'Solutions' Gets Info Price Cut

DELRAN, N.J. — "Datapro Automated Office Solutions," a monthly series of reports and newsletters published by Datapro Research Corp., will be offered at a reduced price to participants at the Info '78 conference and exhibit scheduled to take place in Chicago Oct. 16-19. (See Page 9).

The service, consisting of two looseleaf volumes of reports, Datapro's monthly Automated Office Newsbriefs and use of the firm's telephone inquiry service, will be available for $230 — $60 less than the regular $290 subscription rate, according to a Datapro spokesman.

Additional information can be obtained from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

Contract Work Starts

DOD Expects Standard Compiler by 1981

By Robert L. Glass
Special to CW

FT. WALTON BEACH, Fla. — The people who brought you Cobol took a giant step toward a common standard Department of Defense (DOD) programming language with the recent announcement that work has begun on a contract for the language compiler. The finished product is expected by May 1981.

The announcement was made by Martin Wolfe, who represented the U.S. Army at a workshop on a standard compiler for the DOD language at Eglin Air Force Base here recently.

The contract announcement came as a surprise to many of the workshop attendees. Although the deadline for definition of the compiler had been set for April, 1979 for some time, with the Army contract award scheduled for the following month, most participants here had been taking a "wait-and-see" attitude toward the actual use of the language. The Army's action added a touch of reality and immediacy to the project, attendees agreed.

An additional surprise to attendees was the news that the Army plans to implement the language on a Digital Equipment Corp. PDP 11-70 and that it will be compatible with the AT&T Unix operating system and Programmer's Workbench. Implementing a major language on a minicomputer is especially difficult.

Application Areas

The DOD language was specifically designed for embedded computer system applications — those where the computer and its software are part of some large system, like a spacecraft or weapons system. But its applicability is expected to extend into the areas served by all current standard programming languages except Cobol.

Indeed, it is expected to replace the seven standard languages now in use by the various departments of the armed service, except for Cobol and Fortran. Those include the Air Force's Jovial J3 and Jovial J73, the Navy's CMS-2 and SPL-1 and the Army's Tacpol, according to Lt. Col. William A. Whitaker, who represented the DOD team responsible for defining the language.

Its capabilities — based as it is on the scientific system-oriented language, Pascal — could even result in its being used in Fortran's place, but the goal of the language, according to Whitaker, is to promote the portability of application and tool software across computer lines, across project lines and among the three services.

The language is currently in a design phase with Intermetrics and CII-Honeywell Bull producing competitive language definitions, including a pilot implementation. A decision on the language and the beginning of the standardization process will be made next April.

The means by which DOD will enforce the standardization effort is as yet unclear. When DOD standardized on Cobol about 20 years ago, it required all manufacturers of equipment entering the DOD inventory to have available a Cobol compiler.

This action more than any other triggered the near-universal acceptance of Cobol as *the* business-oriented language, most DP industry observers agreed. Use of this approach to enforce the latest language, however, has not yet been discussed as a probability at any of the language workshops.

The emergence of the language is not without controversy. Prof. Edsger W. Dijkstra, a leader in the field of computing software technology, published a highly critical article on the current preliminary definition of the language in the July 1978 *Sigplan Notices*, a monthly publication of the Association for Computing Machinery's (ACM) Special Interest Group on Programming Languages.

Dijkstra charged that competition for the language resulted in focus on vendor sales efforts rather than on language technology and that language designers were too compliant with the requirements.

"I am pretty sure the new language-if it ever gets designed at all — will be much, much worse than Pascal if they proceed in this fashion," Dijkstra said.

However, Dijkstra himself has been embroiled in controversy during recent months. His attack on a paper about software proof of correctness was published in the April 1978 *Software Engineering Notes*. *Notes* is a quarterly publication of the ACM's Special Interest Group on Software Engineering.

The attack charged three other software technologists with writing a "political pamphlet from the Middle Ages" and "a very ugly paper." The paper had taken the position that software proof of correctness is unlikely to bear fruit because it does not incorporate the elaborate social processes that mathematical proof of correctness utilizes.

Controversy aside, there appears to be little doubt the language and compiler work will in fact be completed close to the schedule arranged by Whitaker. However, one aspect of the language's implementation *has* fallen behind schedule. A name for the language still has not been selected.

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GAO Blames Federal Agencies

Contractors Found Ignorant of Privacy Act

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Private contractors that maintain personal records for the federal government generally are ignorant of their responsibilities under the 1974 Privacy Act, a General Accounting Office (GAO) spokesman said here recently.

Testifying recently before the House Subcommittee on Government Information and Individual Rights, Donald L. Eirich, associate director of the GAO Logistics and Communications Division, said that although most contractors are aware of the need to keep personal information confidential, the potential for abuse of individual rights does exist.

Eirich made these remarks as he explained the results of a GAO investigation of private contractors' compliance with the Privacy Act. The investigation was requested by Subcommitee Chairman Richardson Preyer (D-N.C.).

The study found that contractors essentially "are not doing anything different from before [the act was passed]," according to Eirich.

The primary reason they aren't, he said, is that the federal agencies contracting for the services often don't require private companies to comply with the act because the agencies don't understand the law's requirements in the contracting area.

In addition, he said, the GAO found many private contractors simply are not aware that the work they do for the government might in any way be covered by the act.

Subsection 3(m) of the Privacy Act provides that if a private contractor maintains records on behalf of a federal agency, those records come under the rules and procedures established by the act.

The act, in effect since September 1975, gives each person the right to (1) know what government records on him are collected and maintained; (2) have access to his records and be able to amend or correct them; and (3) prevent information obtained by the government for a specific purpose from being disclosed for another purpose without his consent.

Scope of Review

The GAO's review involved various offices of 10 federal departments and agencies and about 60 contractors. According to Eirich, the review centered on the Veterans Administration, the Department of Health, Education and Welfare and the Department of Housing and Urban Development.

Contractors for these agencies, he said, might, for example, maintain rent-subsidized housing and have information on tenants, or be insurance companies that have information on persons receiving Medicare or Medicaid benefits. The majority of such records, he noted, are to some extent automated.

The problem of private contractors' noncompliance with the Privacy Act has arisen because government agencies are not making it clear to their contractors what their responsibilities are, the GAO found. Contracts rarely even mention the Privacy Act because "the exact applicability of the subsection remains unclear within many federal offices," according to Eirich.

Office of Management and Budget (OMB) guidelines for example, clearly state that systems actually taking the place of those the federal government would have set up itself if not for the contract are covered by the act. However, many of the government's procurement regulations differ from the OMB guidelines, he said.

Eirich explained that the Federal Procurement Regulations (FPR) drawn up by the General Services Administration Postal Service procurement regulations and the Armed Services Procurements Regulations (ASPR) all state that when a federal procurement comes under the provisions of the Privacy Act, the contract should say so specifically. But the OMB guidelines provide that contractors might sometimes be subject to the act even if a system of records cannot be specifically identified when the contract is awarded, he said.

Personnel Training Lacking

GAO found government contracting personnel have, on the whole, had little formal training in the Privacy Act, Eirich told the subcommittee.

The agencies and contractors reviewed paid little attention to implementing Subsection 3(m), he said, because agency officials sometimes had difficulty deciding which contracts should be subject to the act. And even when they considered the law applicable, most agencies did not monitor the contractors for compliance.

Further, when a specific Privacy Act clause was in a contract, the contractor generally did little if anything new, the GAO found, because it was not familiar with the act's requirements.

With rare exceptions, agencies "simply have not monitored contractors' Privacy Act compliance," according to Eirich. The main reasons given, he said, were lack of agency resources and the fact that few, if any, alleged abuses of personal privacy involving private contractors have surfaced.

According to many government contracting officials the GAO found, there is no need to closely monitor Privacy Act compliance, because prior practices assured them that personal information would be kept confidential and secure by the outside contractor.

For example, Girich said, representatives of the medical profession told the GAO their long-standing practices were to treat patient information confidentially, and several corporations noted they normally process sensitive data, such as bank records, for nonfederal clients whose business they could not solicit and retain without assurance of confidentiality and security.

All this notwithstanding, Eirich pointed out that great harm could be done. Not only is it very possible that a contractor would not be willing or able to give individuals the access to their government records the Privacy Act requires, but "some of the types of records contractors handle, such as credit information, have direct commercial value," he said.

In addition, a mailing list audience could exist for other record systems, such as these containing names of military personnel, older citizens or students — depending upon what a commercial firm may be selling or promoting, he added.

GAO Recommendations

Eirich said the GAO would put forward recommendations to remedy the noncompliance problem. To correct the situation, he said, OMB should:

- Improve its guidelines to help agencies decide which contracts should be covered by the Privacy Act.
- Encourage the Civil Service Commission and agencies to include better coverage of Subsection 3(m) in Privacy Act training programs.
- Review and clarify procurement regulations to assure contractors are aware of what information is subject to the act's requirements.
- Reemphasize its existing guidance

(Continued on Page 13)

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Chamber of Commerce Adopts Privacy Policy

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The National Chamber of Commerce recently adopted a revised privacy policy calling for businesses to voluntarily implement safeguards and controls over personal information collected in the course of doing business.

The policy statement, revised in the wake of the 1977 final report of the Privacy Protection Study Commission, was developed over a 10-month period by the chamber's 22-member panel on privacy.

The statement noted that the scope of citizens' rights to privacy regarding personal information about them collected or used by business and government "has become more clearly defined in both the public and private sectors, through research, legislative, judicial and voluntary actions."

The chamber said it supports "voluntary programs by business as the primary means to assure and protect individual rights in business and professional transactions." The following three "basic objectives" were put forward for "an effective privacy protection policy:"

- To minimize intrusiveness by creating proper balance between what an individual is expected to divulge to a recordkeeping organization and what is sought in return.
- To maximize fairness by opening up recordkeeping organizations in ways that will minimize the extent to which recorded information about an individual is itself a source of unfairness in any direction made on the basis of the data.
- To create "legitimate and enforceable expectations of confidentiality" by creating and defining obligations regarding the uses and disclosures that will be made of recorded information about an individual.

Robert M. Hawk, director of the National Chamber's Community and Regional Development Section, said the policy statement is "necessarily general" because of the size and diversity of the Chamber of Commerce.

Hawk added that the group will be developing educational material and may hold regional seminars to "raise the consciousness of business on privacy issues." The National Chamber represents more than 77,000 businesses nationwide, about 85% of which employ less than 100 people, in about 1,200 local and state chambers of commerce.

Security Seminar Slated

PHOENIX — Honeywell, Inc.'s fifth national Computer Security and Privacy Symposium, "Top Secrets '79," will be held here April 2-3, 1979.

The symposium's purpose is to share the company's increasing knowledge and experience in computer systems security and privacy, according to Jerome Lobel, Honeywell's manager of computer security and privacy.

The symposium registration fee is $450, and a $50 discount is given if payment is received at least 30 days before the symposium's opening.

A team discount of an additional $25 per person for groups of two or more from the same organization is also available if the preregistration and payment are received 30 days in advance.

The symposium will be held at the Registry Resort in Scottsdale, Ariz. Registration forms and additional information may be obtained from Jerome Lobel at Honeywell, Inc., P.O. Box 6000, Phoenix, Ariz. 85005.

Contractors Not Aware of Law

(Continued from Page 12)

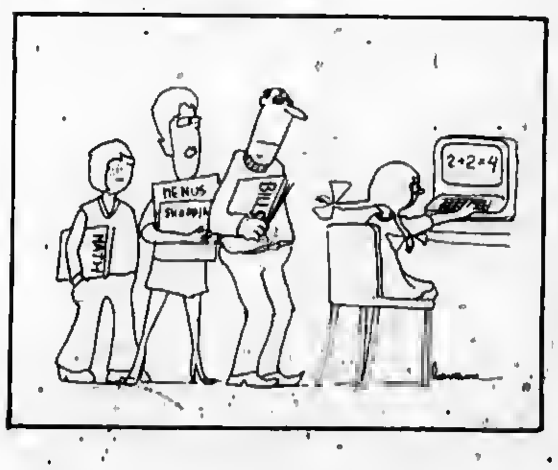
to agencies that all contracts be reviewed for possible applicability of the act.

- Direct agencies to acquaint contractors, through training programs or written reminders, of the act's requirements.
- Require agencies to establish an appropriate method of monitoring contractors' compliance with the act.

Eirich said the GAO will give the subcommittee its final report on the investigation in about 30 days. The GAO is presently looking for any evidence of abuse of personal information maintained by private contractors.

He noted that subcommittee member Paul N. McCloskey Jr. (R-Calif.) said during the hearing that it does not make sense for the government to monitor private contractors more closely if there is no evidence of abuse.

Evidently, Eirich said, McCloskey agrees with the contention of private industry that there is no need of closer monitoring because of the "tradition of privacy in these areas."



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Calendar

Oct. 30-Nov. 1, San Diego, Calif. — **Data Entry Management Association (Dema) Second Annual Conference.** Contact: Dema, 16E Weavers Hill, Greenwich, Conn. 06830.

Oct. 31-Nov. 2, Seattle — **National Micrographics Association (NMA) Midyear Meeting.** Contact: NMA Conference Department, Suite 1101, 8728 Colesville Road, Silver Spring, Md. 20910.

Nov. 1-2 Dallas — **How to Select and Implement an Interconnect System**, sponsored by *Business Communications Review.* Contact: *Business Communications Review*, 36 S. Washington St., Hinsdale, Ill. 60521. Also being held in San Francisco, Nov. 16-17, and in Chicago, Nov. 29-30.

Nov. 1-2, Washington, D.C. — **How to Build and Use a Data Resource Directory**, sponsored by Data Resource Management Associates. Contact: Arnold Barnett, Data Resource Management Associates, 19 Orchard Way North, Rockville, Md. 20854.

Nov. 1-2, New York — **Data Administration/Data Dictionary**, sponsored by Performance Development Corp. (PDC). Contact: PDC, 1101 State Road, Building M, Princeton, N.J. 08540. Also being held in Houston, Nov. 15-16.

Nov. 1-3, Toronto — CEC '78, **Computers, Electronics and Control Fourth International Symposium**, sponsored by the International Association of Science and Technology for Development (lasted); Toronto Chapter, The Institute of Electrical and Electronics Engineers (IEEE); Toronto Chapter, Canadian Society of Electrical Engineers (CSEE); and Toronto Chapter, Canadian Information Processing Society (Cips). Contact: K.C. Smith, Program Chairman, CEC '78, University of Toronto, Department of Electrical Engineering, Toronto, Ontario, Canada M5S 1A4.

Nov. 1-3, Orlando, Fla. — The Association of Data Processing Service Organizations' (Adapso) 49th Management Conference and 18th Annual Meeting, **The Growing Resource for Business: The Computer Services Industry**. Contact: Adapso, 210 Summit Ave., Montvale, N.J. 07645.

Nov. 1-3, Chicago — **User Conference**, sponsored by Computer Management Association, Inc. & Midwest Honeywell User Group. Contact: Registrar, Jack Cook, National Family Opinion, Box 315, Toledo, Ohio 43691.

Nov. 2, New York — **Telephone Traffic Engineering for the Business User**, sponsored by *Business Communications Review.* Contact: *Business Communications Review*, 36 S. Washington St., Hinsdale, Ill. 60521.

Nov. 2-3, New York — **Data Communications: Advanced Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 5-9, Washington, D.C. — **Second Annual Symposium on Computer Applications in Medical Care.** Contact: Helmuth Orthner, George Washington University, Department of Clinical Engineering, 2300 K St. N.W., Washington, D.C. 20037.

Nov. 6-8, San Francisco — **Computer Performance Measurement, Tools and Techniques for Increased System Productivity**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held in New York, Nov. 15-17.

Nov. 6-8, New York — **Computer Contract Negotiations Seminar**, sponsored by Brandon Consulting Group, Inc. Contact: Ruth K. Dargis, Brandon Consulting Group, Inc., 505 Park Ave., New York, N.Y. 10022.

Nov. 6-8, Pittsburgh, Pa. — **The Structure and Governance of Library Networks**, sponsored by National Commission on Libraries and Information Sciences and Graduate School of Library and Information Sciences. Contact: Graduate School of Library and Information Sciences, University of Pittsburgh, 801 L.I.S. Building, Pittsburgh, Pa. 15260.

Nov. 7-9, Washington, D.C. — **Federal Computer Conference**, cosponsored by *Datamation* magazine and Federal Education Programs. Contact: Federal Computer Conference, P.O. Box 368, Wayland, Mass. 01778.

Nov. 7-9, Houston — **Minicomputer/Microcomputer Conference and Exposition.** Contact: Mini/Micro, Suite 1, 5528 E. La Palma Ave., Anaheim, Calif. 92807.

Nov. 7-9, Dallas — **Seventh Annual Meeting of Computer-Aided Manufacturing International, Inc.** Contact: C.H. Link, Computer-Aided Manufacturing International, Inc., Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.

Nov. 8, London — Compec UK, sponsored by *Computer Weekly* and *Data Processing.* Contact: IPC Business Press Ltd., Surrey House, Throwley Way, Sutton Surrey SMI 4QQ, London, England.

Nov. 8, Philadelphia — **Telecommunications Update '78**, sponsored by *Business Communications Review*. Contact: *Business Communications Review*, 36 S. Washington St., Hinsdale, Ill, 60521. Also being held Nov. 9, Boston; Nov. 14, Los Angeles; Nov. 15, San Francisco; and Nov. 28, Chicago.

Nov. 8-9, Chicago — **Understanding Modern PBX Systems**, sponsored by *Business Communications Review.* Contact: *Business Communicatiosn Review*, 36 S. Washington St., Hinsdale, Ill. 60521. Also being held in Washingon, D.C., Nov. 29-30.

Nov. 8-9, Houston — **Software Cost Estimating**, sponsored by Technical Marketing Society of America (TMSA). Contact: TMSA Conferences, P.O. Box 91295, Los Angeles, Calif. 90009.

Nov. 8-10, San Francisco — **Data Base Management Systems: A Comparative Analysis**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held in Washington, D.C., Nov. 13-15.

Nov. 8-10, San Francisco — **EDP Project Management: A Practical Approach**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held in Washington, D.C., Nov. 13-15, and in New York, Nov. 27-29.

Nov. 13-17, Washington, D.C. — **Systems Analysis Workshop**, sponsored by Brandon Systems Institute. Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20014.

Nov. 14-16, Washington, D.C. — **Educom Fall Conference and Annual Meeting.** Contact: Carol Parysz, Educom, P.O. 364, Princeton, N.J. 08540.

Nov. 15, Washington, D.C. — **North American Telephone Association Annual Convention.** Contact: Joe Heeney, North American Telephone Association, 1030 15th St. N.W., Washington, D.C. 20005.

Nov. 15, Toronto — **Building Creditability Into the Organization**, sponsored by the Association for Systems Management (ASM). Contact: ASM, Suite 600, 55 University Ave., Toronto, Ontario, M5J 2H7, Canada.

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The program begins Jan. 8 and the application deadline is Oct. 10, but late applications will be considered if openings exist, a UD spokeswoman said.

Called Fast-Track II, the program is funded by a $178,000 grant from the National Science Foundation (NSF). It is one of several programs sponsored by NSF's Women in Science Program and mandated by Congress to increase the number of women in science and engineering, an NSF spokeswoman said.

At present, "women are underrepresented in the fields of science and engineering," she explained. "Women make up 51% of the population and yet less than 10% are employed as scientists or engineers."

This program is aimed at changing that percentage. Fast-Track II is being offered because the prototype program offered in 1976-77 was very successful, according to Carol M. Shaw, assistant dean of engineering for special programs and continuing education at UD and project director for the program.

"Women completing Fast-Track I were eagerly sought by industries across the country," she said. "A number of women were offered management training programs with Fortune 500 companies. Several women had up to seven job offers and received salaries that were $10,000 greater than what they had previously earned."

A special feature of the program is an initial one-week session devoted to motivation, diagnosis and counseling in preparation for the work of the ensuing year. A professional development course will be offered to support the participants' self-concepts as professional engineers.

Full academic credit will be awarded for all courses taken in the Fast-Track program. Options are available in either chemical or electrical engineering. The program also satisfies all of the UD School of Engineering requirements for a second degree, according to UD.

Students will attend the program full-time from January to December 14, 1979, and take 12 hours of courses in each of three terms: Jan. 16-April 27, May 3-July 27 and Aug. 27-Dec. 14. Self-paced instruction as well as traditional lectures will comprise the courses.

Participants interested in applying for the program should contact Shaw at the University of Dayton, Dayton, Ohio 45469.

USC, Opec Join To Devise Model Of World Energy

LOS ANGELES — The University of Southern California (USC) and the Organization of Petroleum Exporting Countries (Opec) have joined forces to develop a computer-based modeling system that will help project and analyze the future of the world's major energy resources.

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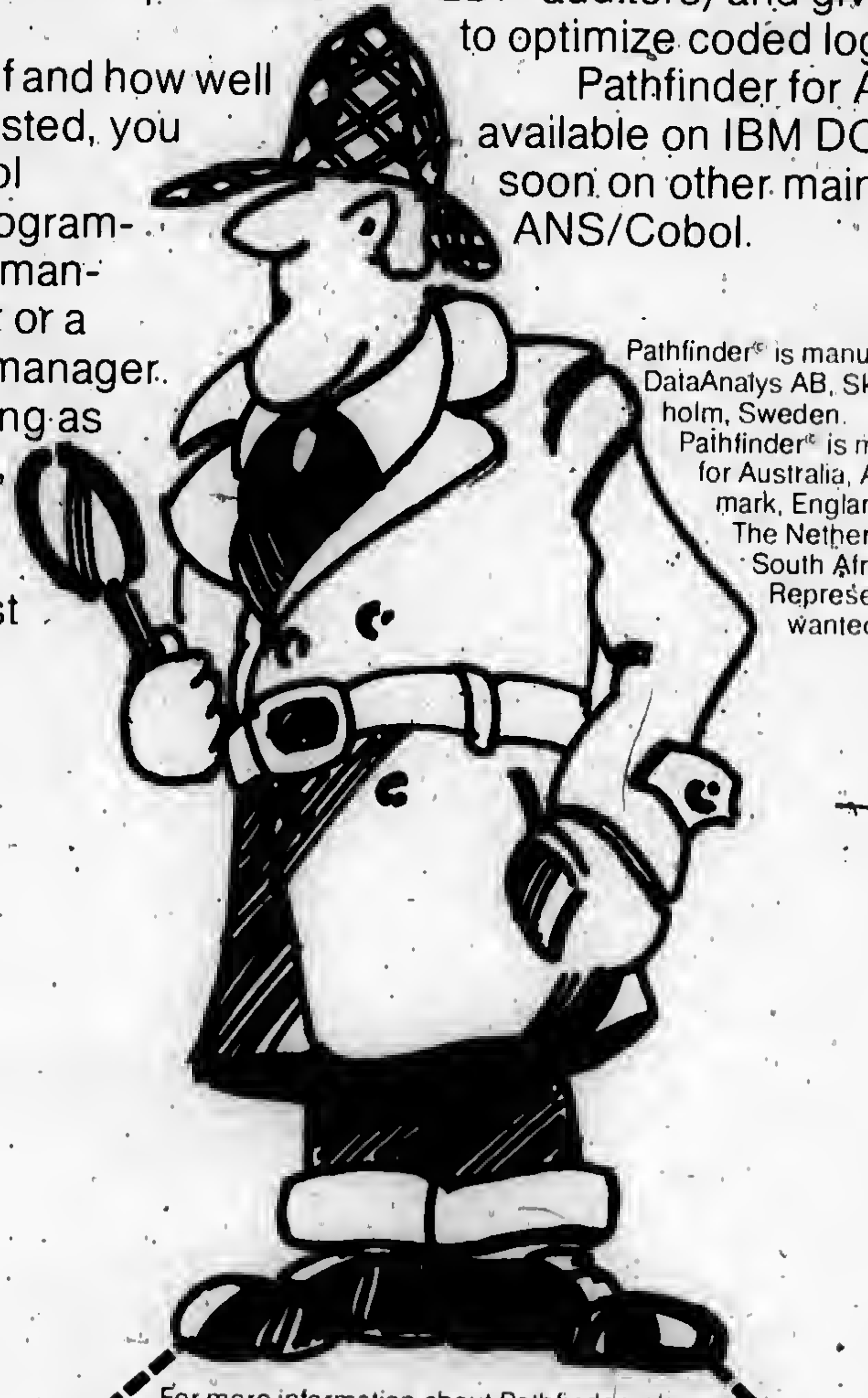

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PHOENIX – The fall 1978 edition of *The Directory of Top Computer Executives* is now available from Applied Computer Research (ACR) here.

The directory contains the names, addresses and telephone numbers of more than 6,000 of the nation's top computer executives. It includes the manufacturers and model numbers of the computers in their DP centers.

The book is priced at $75 for a single copy with additional copies available at $45 each. The annual subscription price, which covers two semiannual issues, is $120.

Mailing labels are also available from ACR at P.O. Box 9280, Phoenix, Ariz. 86068.

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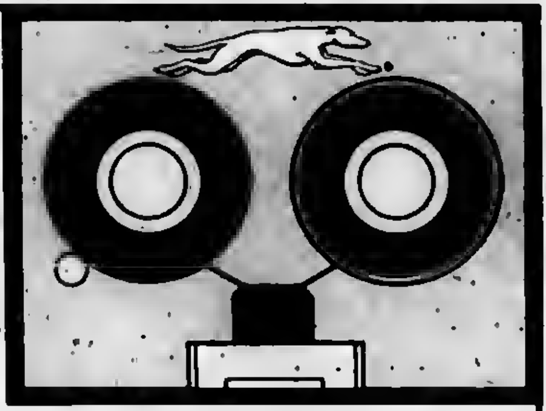

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World Bank Group's Report Suggests Ways to Secure Computer Installations

By Ann Dooley
CW Staff

NEW YORK – Security for a computer installation is effective only if protection is provided at an obtainable level and at a realistic cost. If security measures are not practical and easy to use, they may not be enforced, according to a report on security and reliability for electronic payment systems.

The report, written as a guide for developing, operating and controlling computer installations at banks, was prepared by DP specialists from the central banks of the Group of Ten, an international financial group whose guidelines can be applied to most installations. The Group of Ten includes Canada, France, West Germany, Italy, the UK, the U.S., Sweden, Japan, The Netherlands and Belgium.

The group found use of electronic systems for payments is growing rapidly because financial institutions need to minimize the repetition involved in funds transfer and speed the transfer process, as well as reduce costs and increase reliability. But the report discovered such rapid growth could result in increased improper usage of these systems.

The Group of Ten also found that as technical knowledge and equipment have become more commonplace, a larger number of people can misuse an automated system. In addition, violations of confidence and privacy may harm the system, beyond any direct financial loss involved to the company.

Staff Security

Although no system can be made completely secure, the Group of Ten indicated more attention must be paid to the development of adequate security procedures.

A secure system should ensure proper authorization of transactions before they are entered at an input station. Delivery should be made to the correct output station with the same content that was entered. A secure system also must ensure that unauthorized persons cannot learn the transactions or delay the transmission, the report indicated.

The total protection provided by a security system is related to the level of effective protection at each of its separate points. The risk of violation is highest at the input and output stages and lowest at the electronic processing phase, although that is where the more serious effects can occur, the report indicated.

The large number of input and output stations provide a greater opportunity for potential violators, and compromise at these points is far easier than at the electronic transmission or processing level, the report indicated.

A security system is the responsibility of senior management at each user station and those who operate and control the system network. It is the duty of senior management to ensure user security, effective process controls, tight physical restriction and a comprehensive audit program, the report said.

Senior management should also see that staff members are properly screened and trained since many "trusted insiders" are common system abusers, according to the report. Staff duties should be rotated without warning and certain areas should be restricted.

Employees in sensitive operational and support areas should be made aware of the security policy and should be informed that violations could lead to dismissal or prosecution.

Physical Security

Apart from staff security, the report indicated ways to promote physical security such as the choice of a building location with an eye to weather conditions, proximity of strong electrical fields, accessibility of supplies such as communication facilities and power and the availability of emergency services. The computer room should not be "on display" or have outside windows or signposts to the installation.

Access to the installation should be controlled by guards, passes, identity checks, sign-in/sign-out procedures, escorts for visitors, limited entry facilities, locks or a combination of these approaches.

Storage facilities for disks, tapes, data files, program listings and other vital data should be physically separated from the computers and undergo the same kind of security checks, according to the report.

Emergency Plans

A plan for providing emergency energy supplies, as well as fire precautions, should be of top priority. Attention should also be focused on basic physical components such as equipment reliability, computer system design and software structure.

The central computer system should have a degree of built-in redundancy as well as back-up connections. Mainframes can be duplicated or interconnected on a "shared-load" basis to guarantee continuous operation.

In addition, in case of any fault in either the hardware or the software, system software should permit a full recovery.

Network reliability can be ensured by providing two contingency circuits between telecommunications facilities, the report indicated. In addition, two sets of transmission lines following different routes should be installed between the center and the first node of the phone network.

Telecommunications Dangers

The main dangers in the area of telecommunications lie in unauthorized monitoring or insertion of false messages, according to the report.

If unlawful access to a terminal has occurred, the report signified the next level of security must be to prevent operational access to the system. These precautions can include computer-controlled terminals, stringent sign-on/sign-off procedures, computer verification of operator identity and input and output message control.

Message control, authorization and validation should also be implemented and enforced, the report said.

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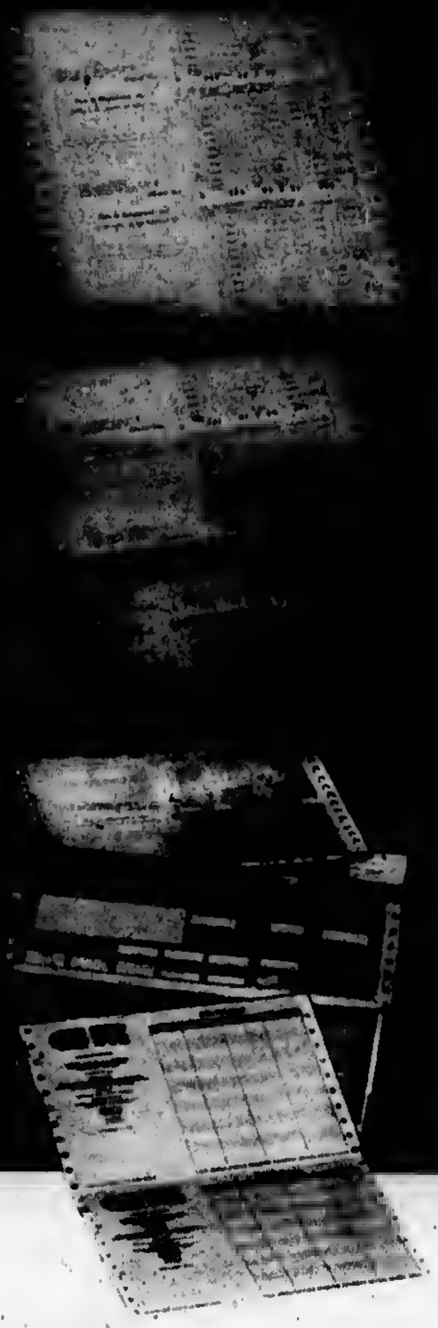

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Aetna's Sitkin Named DPMA Man of the Year

PARK RIDGE, IL. – Irwin J. Sitkin, vice-president of corporate data processing and administrative services for Aetna Life & Casualty Co. in Hartford, Conn., has been selected as the Data Processing Management Association (DPMA) Computer Sciences Man of the Year for 1978.

The annual international award, established in 1968, is given in recognition of outstanding contributions to the DP field.

The council said the selection reflects the current trend in the DP field of special emphasis on DP as an integral part of a business operation, as well as an important management discipline.

The 1978 award will be presented to Sitkin during DPMA's New Orleans '78 international conference, which will be held Oct. 29-Nov. 1.

Irwin J. Sitkin

Sitkin manages Aetna's DP and administrative services functions, which call for an annual budget of $63 million, including DP equipment renting for $17.2 million. He supervises a 2,000-person staff in one of the major DP installations in the U.S.

A graduate of Cornell University with a bachelor of science degree in economics, Sitkin joined Aetna in 1956 as a programmer/systems analyst. He was named a superintendent in 1958, assistant secretary in 1960.

After several other promotions, he assumed his present title in 1976.

New South Wales Planning Steps to Curb DP Crime

CW Australasian News Bureau

SYDNEY – A four-point plan to fight computer-related crime has been proposed by New South Wales (NSW) Attorney General Frank Walker following a report on the subject prepared by the state's Corporate Affairs Commission.

The plan calls for the training of special police and company investigators to detect such crimes; stonger laws to enforce closer scrutiny of computer-based company records; changes to the law of evidence to enable computer-related offenses to be proved more easily; and closer liaison with the computer industry.

Walker said he was convinced much computer-related crime was already being committed in Australia but that its extent was impossible to assess.

Expertise Lacking

"Perhaps our greatest weakness at present is we lack the expertise to detect the cunning and sophisticated plundering that is undoubtedly going on," he said.

He pointed out the rapid expansion of computer technology had outstripped safeguards which might protect the community from computer-related crime.

The report prepared for the Attorney General's department followed an investigation into the subject by Arthur Sindel, research and training director at the NSW Corporate Affairs Commission. During the investigation, Sindel studied firsthand U.S., Canadian and UK programs to counter computer-related crime.

Overseas Liaison

One of the recommendations in Sindel's report was for closer liaison with overseas law enforcement agencies such as the Federal Bureau of Investigation (FBI) and the training of local police on existing installations such as the NSW Institute of Technology.

The report also said computer fraud had rarely been detected by auditing or other conventional means and there was an awareness overseas of the lack of trained investigators.

Sindel recommended that:

- An overseas study tour be made by the NSW Police Department and the Corporate Affairs Commission.
- Local police attend the FBI's academy course on computer crime.
- Basic computer courses be structured for the NSW Police Department.
- Hands-on experience be provided for police at major public- and private-sector installations.
- A liaison with the computer industry be established.
- Law enforcement agencies exert influence toward greater effectiveness in computer security.

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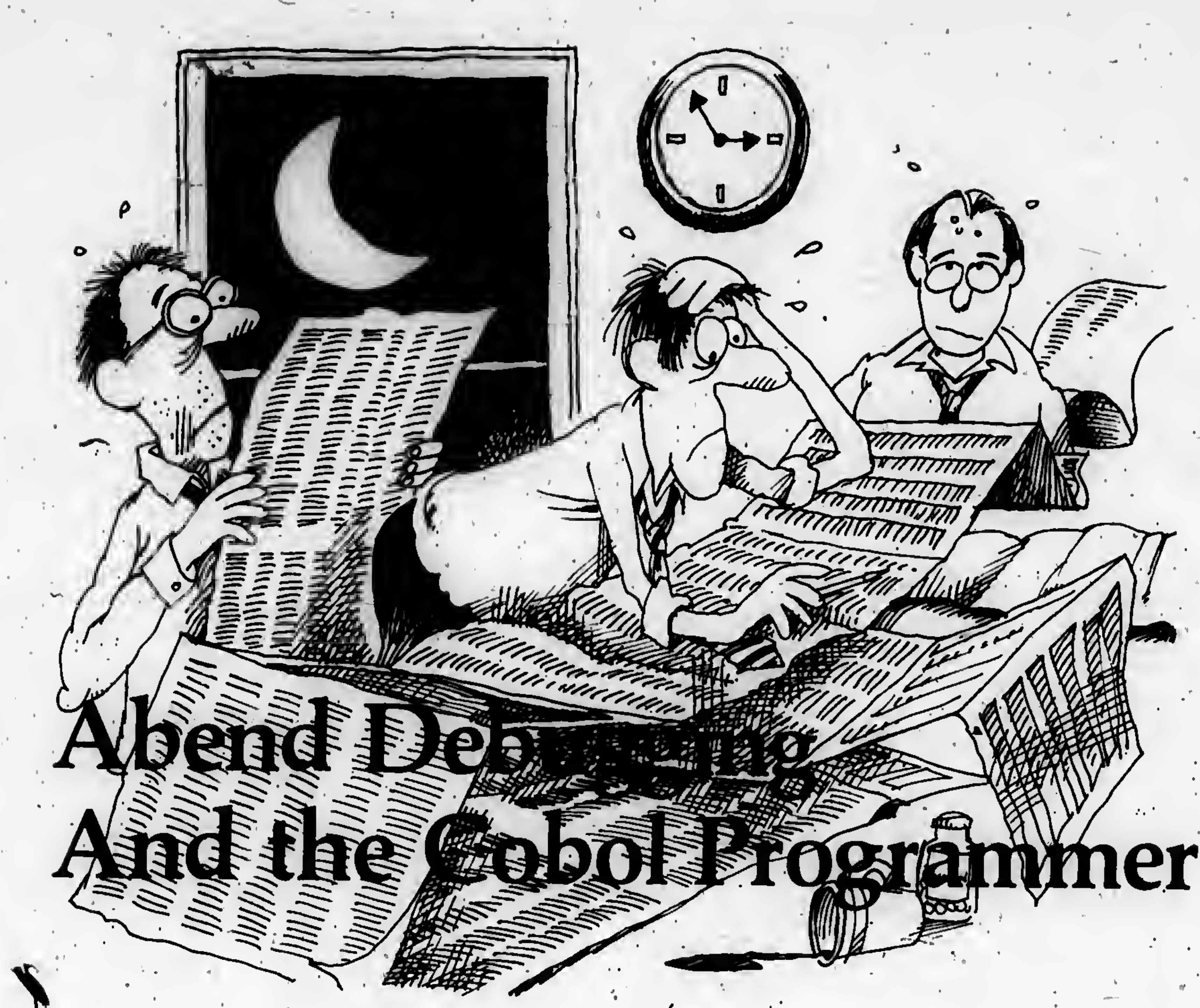

Abend Debugging And the Cobol Programmer

By Bernard H. Boar

Program testing and debugging are the greatest problems confronting the Cobol programmer. Although the testing and debugging of a program are both more difficult and time-consuming than the job of coding it, relatively little time, energy and interest is spent in analyzing how best to perform these complementary tasks.

Common industry practice indicates that testing and debugging (module, program, subsystem, system, acceptance, parallel, release, update, etc.) will consume 33% to 70% of a project's time. While these tasks represent the major cost component of the development or maintenance budget, they are addressed only minimally in both Cobol courses and the professional literature.

A typical training session might consist of eight weeks of instruction on Cobol, JCL, utilities and linkage-editors, with little or no time spent on testing and debugging — which can comprise 70% of the student's job. Similarly, *Computing Newsletter,* a yearly bibliography of DP books for academic instructors, offers more than 50 selections which instruct the reader in "Essentials," "Basics," "Elements of" and "Functions of" Cobol; only four books use the words "Testing" or "Debugging" in their titles.

Program debugging remains a largely ignored area, without the analysis and investigation commensurate with its importance.

Because little formal guidance exists in how to approach, structure and control testing and debugging in general, the situation becomes acute when a programmer is confronted with an Abend dump (IBM OS and OS/VS operating systems). The selection, format and presentation of the dump, a raw machine-level hexadecimal dump of core storage at the time of the program or system logic error, is completely unrelated to the source Cobol program.

This presents both a dilemma and paradox to the programmer. A primary objective of Cobol was to provide a machine-independent and English-like language. High-level programmers would not need to know the intricacies and dynamics of either the operating system or hardware.

Unfortunately, this objective, when implemented, was confined to the input side only. As illustrated in Figure 1 on Page 21, the compiler and linkage-editor convert the familiar Cobol source code into a machine-executable format. If an Abend should occur, however, no reverse (machine-level to source-level) conversion occurs on the output side.

Ill-prepared, the programmer is papered under by pages of hex and storage and system-level control blocks that are all irrelevant to Cobol. Since Cobol is a high-level language, most programmers are not formally trained in how to relate the raw core dump back to the source code and/or JCL.

Yet, the standard debugging aid provided to the programmer when a test or production system fails is a machine-level dump. What, then, is the programmer to do to solve this dilemma?

'Leave Out the Bugs'

A general approach to solving this problem is to avoid the need to debug at the dump level by either writing bug-free programs or by using source-level debugging tools when available. As J.D. Aron of IBM has said, "The best way to write a correct program is to leave out the bugs."

This might seem a bit obvious, but it sums up the thrust of a great deal of current literature related to program design, testing, debugging and development. The goal is to build systems which by their inherent construction will be bug-free. The strategems used — from system conception through implementation to maintenance — will prevent bugs from entering the program code or, at minimum, catch them early in the development cycle.

This philosophy is often summarized under the broad categories of software engineering and programmer productivity techniques (Figure 2 on Page 21). These techniques represent an evolutionary approach to program and system development which will minimize bugs and, consequently, Abends.

Of particular value to the debugging analyst are defensive programming and antidebugging coding. They acknowledge the error-prone nature of program development and provide guidelines for minimizing it.

In spite of the considerable success that comes from using these techniques, programs still Abend. A correctness proof does not yet exist; in the foreseeable future, programmers will still:

- Fail to initialize fields.
- Miss validation checks.
- Subscript (index) incorrectly.
- Invert CALL/ENTRY linkage.
- Leave out or incorrectly insert periods.

Bug-free programs remain an unrealized goal.

(Continued on Page 21)

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(Continued from Page 19)

Since Abend debugging cannot be totally eliminated, the programmer requires an effective set of methods and techniques to deal with them. Toward this end, he needs to know how to use the available debugging tools and; of primary concern, he must have a clear understanding of what type of information is required to isolate the cause and solve each occurrence.

Common Abends

The common types of Abends confronting the Cobol programmer can be divided into three classifications:

- Problem program.
- Data management.
- Supervisor.

Problem program Abends are the most prevalent. They signify errors which represent the improper use of data and/or instructions by the program. OC7, OCB and OC4 error messages are frequent in this group.

When confronted with an OCX series Abend, the analyst needs to know the information itemized in Figure 3.

The first three items establish the immediate technical cause of the Abend (e.g., a subscript value exceeds the size of a table). The last three are used to establish the logic failure. They address the flow reconstruction question of "What was the series of events which precipitated the error?"

Data management Abends are the second most prevalent type of Abends confronting the Cobol programmer. They signal an incorrect interface between the program and an Open-Close-End-of-Volume (O/C/EOQ) function.

A common example of this family is a B37, which denotes that space became unavailable while writing to a direct access storage device (DASD). In these cases, the analyst needs to know both the file in error and a clue to the interface malfunction. A B37 could be caused by a variety of events:

- A write-loop which has exceeded the permissible number of extents.
- An excessive output file size, one which has exceeded the permissible number of extents.
- A secondary requested space allocation too large for the available space.
- A lack of secondary space.

The corrective action would be different in each case.

Supervisor Abends encompass all other Abends resulting from an interface error between the program and the operating system. A typical example is an 804, which signifies that insufficient core was requested by the JCL RECION parameter.

The programmer needs to know the actual needed core. With this data, a corrected REGION value can be calculated.

Independent of the Abend category, the data provided to assist in analyzing the error should be in high-level format. Since the programmer's training and experience are in Cobol, any alien format requires new skills to be mastered, many of which would require hardware and operating system knowledge beyond what is customarily expected of an application programmer.

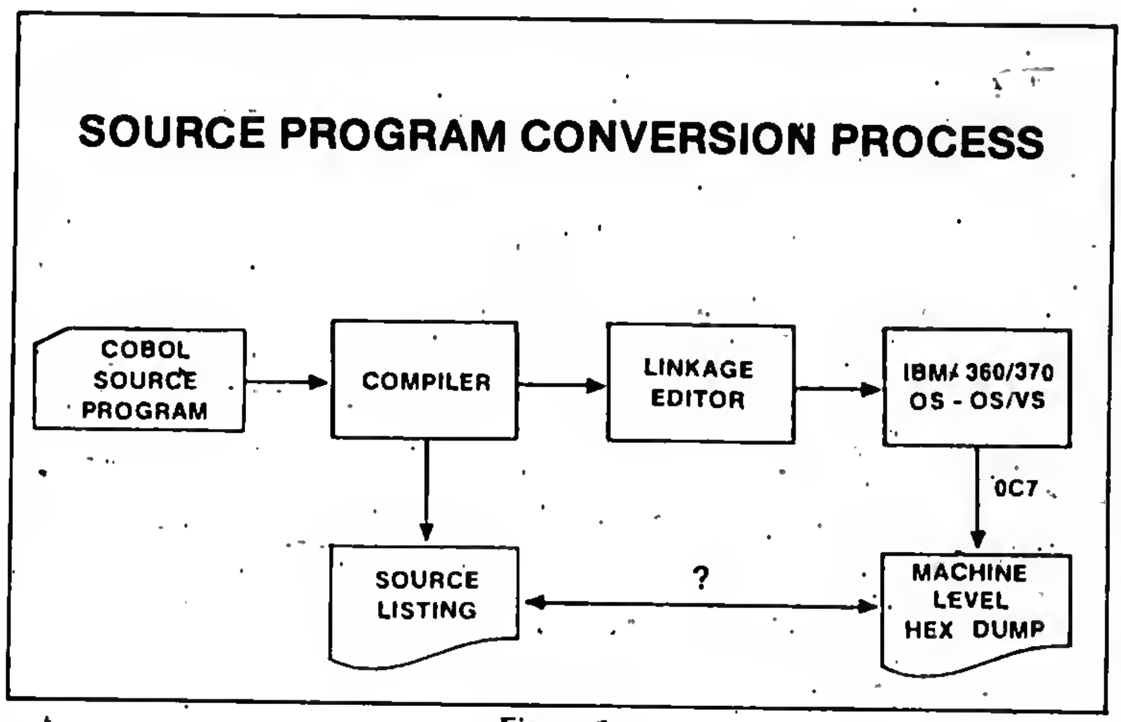

Figure 1

Debugging Tools

There are five categories of debugging tools (Figure 4). Cobol Debugging verbs are part of the Cobol language and as such are immediately understandable to the programmer. As an Abend debugging aid, they have mixed value, as Figure 5 illustrates.

Consider a modular program consisting of 10 modules. If the program were to Abend with an OC7, perhaps nine trial-and-error recompiles and link-edits would be required to isolate the erroneous module, instruction and core data values.

Although this is a possible approach in a test environment, it is not feasible with production Abends.

The impact of these Abends on both operations and the user require them to be fixed as quickly and efficiently as possible. A trial-and-error debugging verb approach would provide neither a satisfactory support level or a satisfactory response level.

Abend Monitors

Abends monitors, developed by numerous software vendors, provide various debugging aids. In general, when a problem program Abend occurs, the monitor intercepts the Abend, prints an edited dump which highlights certain key debugging control data and resumes program execution by reinitializing the erroneous field with a valid numeric value.

The number of Abends so "trapped" per run is usually user-determined. The manner of using them is product-determined. In some instances, source code must be altered, while in other instances only additional DD files must be defined.

Monitors provide a number of benefits to the programmer:

- Dumps are small (one to five pages instead of 50 to 250 pages).
- In a test mode, automatic patching of data by a 0 or 1 is often OK and the overall run is not wasted because of a minor mistake.

PROGRAMMER PRODUCTIVITY TECHNIQUES

- **Structured Design**
- **Top-Down Design**
- **Functional Design**
- **Composite Design**
- **Top-Down Development**
- **Hipo**
- **Structured Programming**
- **Chief (Super) Programmer Teams**
- **Development Libraries/-Librarians**
- **Structured Walkthroughs**
- **Modular Programs**
- **Defensive Programming**
- **Antidebugging coding**

Figure 2

PROBLEM PROGRAM ABENDS

- **Module in Error**
- **Instruction in Error**
- **Contents of Data Fields Being Operated on by Erroneous Instruction**
- **Contents of Other Data Fields**
- **Intramodule Flow**
- **Intermodule Flow**

Figure 3

ABEND DEBUGGING TOOLS

- **Cobol Debugging Verbs**
- **Vendor Software Monitors**
- **Time-Sharing Interactive Debuggers**
- **Cobol Version 4 Symbolic Debugging Options (State Flow, Symdmp)**
- **Core Dump Debugging**

Figure 4

COBOL DEBUGGING VERBS

VERBS

Ready/Reset Trace
Exhibit
On
Debug

DEBUGGING VALUE

POSITIVE	NEGATIVE
• Cobol source level	• Clumsy and time-consuming
• Output Cobol format	• All trial and error
• Tracing capability	• Always requires additional runs after the fact

Figure 5

- Important debugging data (control blocks and core storage) is selected, highlighted and formatted.
- A partial analysis of the error's cause is often mechanically performed.

Negative Considerations

Unfortunately, the user must also be aware of some negative considerations. First, although highlighted and edited, the data is still most often presented at the machine level. An intelligent analysis must still be performed to relate the monitor data to the source code.

Secondly, automatic patching by rote insertion of a 0 or 1 may correct the immediate problem, but cause further logical failures. If, for example, the Abend was caused by a bad subscript, substituting 0 for the subscript will merely cause further errors. The sim-

(Continued on Page 22)

IN DEPTH

(Continued from Page 21)

ple "numerization" of fields leaves the logical failure intact.

Third, little is provided to help analyze the actual logic error. The selective dumps provide sufficient data to isolate the immediate technical failure, but the data needed for flow reconstruction is often not avaialble.

Last, monitors cannot be used in a production environment. The actual logic failure must be isolated and corrected to ensure the systems integrity. Nonintelligent artificial patching can cause subtle — if not disastrous — damage to the overall utility of a system.

Software monitors can be used as a valuable aid, but with proper respect for their drawbacks.

Interactive Debuggers

Time-sharing interactive debuggers provide a facility from which the programmer can interactively control, modify and examine program execution in a real-time environment. While the program is executing, via terminal commands, the programmer can dynamically trace instruction flow, display field values and modify the execution sequence, among other things. TESTCOB and SYMDMP are two widely used examples of the interactive debuggers.

What is particularly valuable is that when a program under its control Abends, the program can be debugged at the source code level. When an Abend occurs, the debugger automatically displays the module name, source line number and relative verb number causing the Abend. Field values may be requested by source data name. If necessary, dynamic traces and field displays may be requested.

The programmer does not see or need to analyze a core-level dump: The debugging process is handled at the desired source level.

Unfortunately, interactive debuggers are confined to the time-sharing environment. After the system is transferred to a batch production environment, this excellent tool is not available.

Symbolic Debugging

The primary benefit of interactive debuggers is that they provide the necessary data at the source level. To a lesser extent, this source code presentation is provided in a batch mode by the Cobol version 4 compile time options of STATE, FLOW and SYMDMP. When used in combination, they often eliminate the need for a core dump analysis.

The STATE option is illustrated in Figure 6. It is invoked by the compile time parm option of STATE and requires minor execution JCL changes. The primary benefits of STATE are:

- It identifies at source level the module, source line and verb causing the Abend. This is especially beneficial in highly modularized or overlay programs.
- It is easily used.
- It requires minimal increased overhead for the incurred benefit.

STATE, however, also has several drawbacks: It must be specified for each and every module of a executable program; it is not available on all current popular compilers; and it doesn't provide assistance in locating data field value or tracing inter- or intramodule flow.

The FLOW option is illustrated in Figure 7. Like STATE, it is invoked as a compile time option and requires minor JCL changes. FLOW has the benefits of being easy to use as a compile option and addresses the problem of tracing intramodule flow.

However, it doesn't do what STATE does. It has a high execution overhead and it must be specified in each and every module if an intermodule flow is to be obtained.

The SYMDMP option (not illustrated) provides what STATE does but, in addition, provides a source-level core dump. When combined with the FLOW option, it essentially provides a full source-level debugging tool and minimizes the need for core-level debugging.

SYMDMP will identify the module, source line and source verb in error and provide a source-level presentation of all data fields. It is also easy to use on stand-alone or small modular systems.

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Its drawbacks? The SYMDMP option requires a high overhead utilization of resources; it is not geared for use in highly modular programs; it can be clumsy and difficult to use because of the additional file allocations needed; and it is not appropriate for a production environment.

Core Dump Debugging

Core dump debugging is the historical means of adressing the Abend problem. Depending on whether a SYSUDUMP or SYSABEND option was selected at execution time, either a huge or horrendously huge raw hexadecimal core image of the state of the system is provided.

Nevertheless the dump remains a vital debugging aid because:

- It is the only standard aid provided. All other tools are superimposed on the operating environment and may or may not be available in a critical situation.
- Once mastered, the dump provides a complete picture of the system at the point of error and a virtually unlimited reservoir of information to analyze.
- Core-level debugging is the bottom line in a production environment.

Figure 8 highlights the critical importance of core dump debugging. While the other tools are available and valuable (especially in a test mode), the core dump remains the only assured aid in the production mode.

In spite of the many advances made in system and program design by the advent of software engineering techniques, programming remains a very error-prone activity performed by error-prone people. The available dump debugging aids provide substantial help in analyzing and correcting errors.

Unfortunately, the core dump still remains the necessary pillar of debugging activity. Hopefully, in the future, a source-level debugging report will become the standard aid and alleviate the problems of dump debugging.

DEBUGGING TOOL SUMMARY

TOOL	ENVIRONMENT TEST	 PRODUCTION
Cobol Debugging Verbs	Adequate But Time-Consuming	Inappropriate
Vendor Software Monitors	Usable	Inappropriate to Dangerous
Time-Sharing Interactive Debuggers	Excellent	Not Available
Cobol Version 4 Symbolic Options	Good	Good, But High Overhead
Core Dump	Difficult to Use Unless Staff Properly Trained	Bottom Line Standard Error Report

Figure 8

STATE OPTION

```
//A EXEC COBUCLG,
// PARM.COB=STATE
// COB. SYSIN DD*
      source program
/*
//GO.SYSDBOUT  DD  SYSOUT=A
//GO.STEPLIB    DD  DSN=SYS1.COBLIB
PROGRAM TESTTAPE
LAST PSW BEFORE ABEND=
SYSTEM COMPLETION CODE =OC7
LAST CARD NUMBER/VERB NUMBER EXECUTED CARD
      NUMBER 000796/VERB NUMBER 02

END OF COBOL DIAGNOSTIC AIDS
```

Figure 6

FLOW OPTION

```
//A EXEC COBUCLG,
// PARM.COB='FLOW=10'
//  COB.SYSIN DD *
    SOURCE PROGRAM
/*
//GO.SYSDBOUT  DD  SYSOUT=A
//GO.STEPLIB   DD  DSN=SYS1.COBLIB

      PROGRAM TESTTAPE

LAST PSW BEFORE ABEND=
SYSTEM COMPLETION CODE=OC7
        FLOW TRACE
TESTTAPE  000796,000799,000802
        END OF COBOL DIAGNOSTIC AIDS
```

Figure 7

Bernard H. Boar is project leader for the development and maintenance of the corporate hourly payroll system for the 50,000 blue-color employees of the Bell Sales Division. He is also the leader of a project charged with planning and developing the next-generation corporate payroll system.

The Abend Debugging for Cobol Programmers, *published in April 1976 by John Wiley and Sons, Boar is active in the Association for Computing Machinery.*

He holds a bachclor's degree in Computer Science. from City College of New York and an M.B.A. from Baruch Graduate School of Business, where he specialized in computer methodology.

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Fringe benefits cost too much these days to neglect.

Editorial

Benefit of Looking Back

The DP community and the society it serves stand to benefit from ongoing study programs in the history of computing.

The American Federation of Information Processing Societies is now sponsoring a number of activities devoted to this study, and Erwin Tomash of Dataproducts Corp. has founded the Charles Babbage Institute towards the same end [CW, Aug. 7, 14].

A sense of history in any field can show what is truly important to that field — why it exists and where it ought to be going. Appropriately enough, John von Neumann, one of the founders of computer science, perhaps said it best in writing about "mathematical subjects":

"I think it is a relatively good approximation to truth . . . that mathematical ideas originate in empirics, although the genealogy is sometimes long and obscure. . . . At a great distance from its empirical source, or after much 'abstract in breeding,' a mathematical subject is in danger of degeneration.

"At the inception, the style is usually classical; when it shows signs of becoming baroque, then the danger signal is up . . . Whenever this stage is reached, the only remedy seems to me to be the rejuvenating return to the source: the reinjection of more or less directy empirical ideas."

Sign of Change?

Since the inception of *Computerworld*'s "Managers on the Move" column last May 15, announcements featuring women who have been promoted to executive-level positions or recently hired for management slots have been as common as kiwi birds in Alaska.

Perhaps the news of Patricia R. Graves' promotion to assistant vice-president of Trusco Data Systems of Georgia, which appeared in last week's column, signals a break in the long-standing absence of women executives in DP organizations.

We hope to see more such announcements as time goes on.

Data Past

Five Years Ago
Oct. 3, 1973

DES MOINES, Iowa — A data bank law passed by state legislators apparently backfired, accomplishing the opposite of what was intended. In an effort to curtail the release of computerized crime records fed into the Federal Bureau of Investigation's National Crime Information Center (NCIC) system, the lawmakers had enacted a bill they thought would require the destruction of computerized arrest records on individuals found innocent or against whom charges had been dismissed. Instead, according to Attorney General Richard Turner, the law permitted police to release the records of innocent persons, but required them to keep secret the arrest records of those found guilty. Turner called the situation "a classic example of carelessness in legislative drafting."

— — —

TULSA, Okla. — Both IBM and Telex Corp. filed motions here seeking to amend judgments made in their antitrust suit. The IBM motion sought a new trial on the specific issues of the amount of damages awarded to Telex and the injunctive relief specified by Judge A. Sherman Christensen in the case. Telex asked the judge to set aside the $21,9 million damage award he granted IBM for the Telex theft of trade secrets. Telex asked the judge to reduce the amount IBM was required to pay it to around $330.6 million.

Eight Years Ago
Oct. 7, 1970

DETROIT — This city's primary election was highlighted by "discrepancies, irregularities, and a mysterious extra 1,110 votes." The errors were attributed to test decks that didn't work, outside supervisors and observers who were not familiar with computers and inadequately documented backup procedures.

— — —

CHICAGO — Violence, demolition, fire and sabotage threaten university computer centers, the information nets of police and court officials, governmental agencies and industrial and commercial DP centers, according to Neil J. Welch, special agent in charge of the Detroit Office of the Federal Bureau of Investigation. Speaking at an FBI-conducted bomb seminar, Welch estimated total damages in these areas in the last 15 months at $25 million and listed the would-be bombers among the "New Left, the Black Panther Party, the White Panther Party and the Weathermen, a faction of Students for a Democratic Society."

Letters to the Editor

Code of Ethics 'Illogical'

The headline "Code of Conduct Arises from Afips Workshop" [CW, Sept. 4] promised a great deal. But the opening sentence, "Do what is right, regardless of the consequences," can be paraphrased as, "It is always right to do right."

Reading further into the article, I encountered, "information technology should not be used for any intentional deception, except where weightiest justification is provided;" which can be paraphrased as, "It is not always wrong to do wrong."

Now I'm confused! If "It is always right to do right," then "it is not always wrong to do wrong" is illogical. Do computer people have a different set of logic and moral ethics? Do we subscribe to relative morality? And while we are being illogical, what does being a professional have to do with a code of ethics — or don't we have ethics if we are not professionals?

Thirty participants for three days to generate the so-called "code of conduct"? The mountain groaned and put forth a molehill.

J. Foecke

St. Cloud, Minn.

Scoring on the Greens

I am writing to clarify a point made in "Fast Greens on Par With Fast Scoring at PGA" [CW, Aug. 28].

Referring to Wang Laboratories, Inc.'s and Aptech Computer Systems, Inc.'s participation in the Professional Golfers Association (PGA) tournament at Oakmont Country Club, the story concluded: "The result was the first system with which reporters could directly interact to obtain instantaneous information retrieval."

CompuServe, Inc. has had a computerized golf score tabulation system for more than a year which was used on three occasions by the PGA — once at the 1978 Tournament Players Championship at Sawgrass near Jacksonville, Fla., and twice at the Muirfield Memorial Golf Tournaments in 1977 and May 18-21, 1978 near Dublin, Ohio.

At the 1978 Muirfield tournament, reporters had access to hole-by-hold results as they happened through a version of the Infoplex information processing system, marketed by CompuServe's subsidiary, Plexus Corp.

Computer terminals with user instructions were set up in the pressroom, permitting reporters to run the system at any time for the latest scoring information.

The network set up at Muirfield placed terminals and CRT monitors at several locations throughout the grounds and allowed inquiries on any player for his average score per hole as well as the number of eagles, birdies, pars and bogies. The program also ranked the difficulty of each hole based on the players' performance.

Richard A. Baker

CompuServe, Inc.
Columbus, Ohio

Irksome Question

I have a nit to pick. It would seem that people who make their living in the data processing field should know that the word "data" is plural. For "the newsweekly of the computer community" to misuse the word as if it were singular is deplorable. How about leading a crusade to enlighten readers and especially CW writers regarding the correct usage?

Norman L. Vincent

Bloomington, Ill.

While Reader Vincent is semantically correct, even Webster's New Collegiate Dictionary recognizes data as "plural but singular or plural in construction." In many instances, CW uses the word in a collective sense which warrants singular verb forms. Ed.

The Human Connection

Executives Need Hands-On System Course

By Jack Stone
Special to CW

Training senior executives in information systems is an industry nightmare.

As everybody knows, most business and government leaders are not blessed with our wonderful information systems education. The distressing part is that because of the long and tedious history of doing battle with the information systems departments, most have chosen to ignore its function and avoid learning more about it.

The faithful minority are the real losers; they dutifully appear for the training sessions provided by their own information systems departments and wind up bored to death.

Pains, Pleasures

I have had both painful and pleasurable experiences as a consultant while struggling to develop and implement executive training programs. So I thought it would be useful to devote this column, and others from time to time, to what I have learned about making these programs more effective. Training in technology cencepts is this week's subject.

Not too long ago, I had an opportunity to compare concept learning patterns for large groups of people. The occasion was the introduction of an on-line data base management system (DBMS) to a large organization.

One of my tasks was to implement a four-day introduction to the system for the user population which had not had any significant information systems technology training; although many were professional scientists and engineers. As you might imagine, terminals were installed in a classroom, and the instruction consisted of a series of brief lectures followed by hands-on exercises.

Well, believe it or not, of the horde of users that passed throgh the program, the best students were the top-level and middle-level managers. They became completely involved: they ate up the exercises; they whizzed through the optional "experiments;" they scanned their very own data bases — they were terrific! And all this after they entered the class mostly skeptical, and in some cases, hostile.

Terminal Magic

I'm not sure why using the terminals worked so well. Perhaps managers can conceptualize better than other employees or maybe the interactive terminals just sparked a lot of interest. In any case, it is important to apply the following rules:

- **Rule 1.** Orient technology concepts training around "hands-on" keyboard CRT terminals, (microsystem interfaces or whatever else you can dig up). These people learn fast when they are in a highly interactive mode; as a matter of fact, it's hard to pry them loose from the terminals.

I also learned, to my chagrin, that my glorious lectures were no better than second-rate sleeping pills if they lasted longer than two or three minutes.

- **Rule 2.** Do not use conventional lectures in information handling technology with this audience. Limit stand-up presentations to a few minutes and focus the talk on the most elemental ideas the attendees will be addressing during the hands-on session.

Finally, let me talk candidly about the problem of "image." The brutal fact is that most executives view the information systems department as one without "class." And, in response, many management information systems (MIS) people have done their best to perpetuate this belief, particularly when one considers such factors as orderliness, oral communications and user documentation.

- **Rule 3.** Go first class or, at the very least, emulate it for the program's duration.

This means speakers should borrow or rent vested suits; someone should write down an agenda and include a schedule, maybe toss in an objective or two; the training facility should be located sufficiently far from the programmers to avoid hearing their hysterical laughter; and a decent sum of money should be spent for a print job on the narratives to give the attendees a fighting chance at reading their exercises!

I've got a recent case study for you in next week's column.

And if you have had any experience with executive training you wish to share (identities not revealed), send it to me. A free copy of the second edition of my informal paper, "Training the Top Executive," can be obtained by sending a self-addressed, 30-cent stamped, No. 1 envelope to me at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

. . . And in This Corner

Crooks Setting Standards As Users Can Only React

By Kenniston W. Lord Jr.
Special to CW

Standards! If I've heard that word once in my career, I've heard it a "zillion" times. Throughout a quarter century, we've had standards committees, national standards organizations, de facto standards, systems design standards, programming standards, audit standards, local standards (enforced or not) and "practical standards."

But suppose, for the sake of argument, that all of the millions of words on the subject had been just the sheer exercise of words; had been a convenient way to convey the impression that we had taken steps to cover organizational vulnerability? Don't suppose — *recognize* — that millions of dollars of our budgets have been spent in pursuit of the elusive and enforceable code whereby our systems have been constructed and are run.

For what? Has it really saved any money? Has it really made the documentation easier? Has it really normalized project management efforts? Has it really covered that tender part of our organizational anatomy? Has it really prevented computer crime and . . .

Aha! Now the truth comes out. What we haven't been able to do for ourselves in a quarter of a century, the white collar criminal is doing for us free — well, almost. What's another cool hundred thousand?

Read the press. Item after item recounts how the computer has been used by the white collar criminal. Each and every item on fire, theft, proprietary data, pilferage and fraud tells tales of what has gone on before — ancient history, as it were.

While we're sleeping, protagonists of computer crime and abuse are setting our standards for us. They don't have to read a manual to do it, and they don't have to refer to a checklist. They're not even concerned about "Quality Assurance Checkpoint #6," or any other, for that matter.. But in their own style, they are setting the rules under which we must operate the DP business for the next quarter century and beyond.

Try as we will, we still have not developed a foolproof method to protect our data, programs, procedures and access. All we have been able to do is to react — not plan, not protect and not prepare.

Why? Are we so lacking in our ability to anticipate where our vulnerability lies? Is it only a matter of money? It might be that we, ourselves, have little concept of what is really important.

"Protect the passwords," said

(Continued on Page 26)

The Taylor Report

Utility's Dunning Letter Could Be World's Worst

By Alan Taylor
Special to CW

I've seen many amusing computer dunning letters, such as one which gratefully acknowledged the receipt of $68.95 but regretfully pointed out a balance of $0.00 remaining to be paid and went on to demand such payment forthwith on threat of credit status loss. But I've seen other erroneous dunning letters of greater import, such as those based upon mistaken records which resulted in the cutoff of heat or other utilities.

Such errors can be computer-related or simply the result of careless bookkeeping.

With the help of a reader from Tewksbury, Mass., I've just been put in touch with possibly one of the worst computer dunning letters in the world. The letter shows so many problems that it is laughable, but it deals with the serious subject of energy cutoff.

It reads as follows:

8/92/17
(Account Number)
(Name)
(Address)

Dear Customer:

Thank you for the recent payment on your gas account.

Unfortunately there does remain a balance in arrears that has to be cleared.

To prevent further collection action, please contact our Credit Dept. at 458-3171..

Thank you for your cooperation.

Lowell Gas Company

At first, I thought it was a hoax. How could the letter contain so many errors? To appease my doubts, I called Lowell Gas Co., the purported issuer of the letter. Its credit department confirmed it had indeed issued the dunning letter.

Four Errors

My reader pointed out four computer errors in the letter:

- An unintelligible date — 8/92/17.
- No space to say what recent payment was being acknowledged.
- No space to say how much the customer still owed.
- No address for the gas company on the return envelope.

Personally, I think there is at least one other error — no specified due date for payment of the claimed balance.

Lowell Gas' credit manager admitted some errors. The date was supposed to be Aug. 9, 1978. So, perhaps the editing input or output field was wrong in the program.

(Continued on Page 26)

Errors Humorous, But May Be Dangerous

(Continued from Page 25)

He had no explanation for the missing address — I suspect it was printed on blank paper after being programmed for printed stock.

The procedure was to send the letter to the customer and, if the money did not arrive within five days, a collector was sent out with full authority to disconnect the gas.

Interesting to note, the credit manager was not familiar with the Memphis Light & Gas case [CW, May 8] and thought the company could disconnect for unpaid bills without questioning the accuracy of its records.

A *complete* dunning letter could help prevent the unnecessary disconnection of vital utilities. Clearly, the letter is part of the accounts receivable program's output — the first sentence tells that. And it has access to the new balance and the amount of the last payment, otherwise the second sentence couldn't be used. The date of the last billing must be available — at least the billing cycle date if not the mailing date.

All this information was within reach, but was ignored by the letter's designer. From a professional viewpoint, this is my main objection.

I see basic DP errors in three areas: programming (date field unsynchronized), operations (printed on blank stock) and design (available information not given).

However, the credit manager at Lowell Gas told me about the system's success: "It has worked pretty well . . . and has avoided a lot of collection calls." Computer systems can be "successful", even when they are dangerously *wrong*. Everyone in the profession should realize this in evaluating computer "success stories."

In this case, a collector's brief visit to a house, with or without the customer's presence, can result in utility cutoff. While this is permissible if the records are correct, in some cases they are not.

Positive action is needed to initiate discovery of computer errors. Those missing pieces of data in the computer dunning letter should be *requirements*, as opposed to desirable trimmings.

If a customer is notified in writing of the date of his last payment, of the amount still owed and so on, he can search for old bills and checks to make comparisons. If computer errors are the culprit, the customer or the collector will have an easier time locating them.

On the other hand, if a vague letter devoid of concrete detail is sent to the customer, he may feel it is useless to get his records out, since there are no important details to compare.

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Now Another Way To Spell

Relief...

Multiple Transient Support For All DOS/VS Systems

Relieves congestion resulting from single-thread use of the Logical Transient Area.

Relieves delays to on-line systems caused by the Logical Transient Area being occupied.

Relieves inhibited communications with POWER and other spooling systems which require the LTA.

CFSMTS Overview:

CFSMTS is a DOS/VS system enhancement which provides multiple Logical Transient Areas; one per partition and one for the Attention Routine. CFSMTS is release independent and supports systems with up to 15 partitions. CFSMTS will run on all DOS/VS systems including the S/370 115 through the 370/158, 3031, and S/360 or compatible machines.

Features:

Each problem program can concurrently execute code which requires use of the LTA (Logical Transient Area).

CFSMTS provides a dynamic classification facility to control the concurrent usage of $$B transients which are dependent on a single resource.

The user may classify his own transients or any other transients at any time by executing the CFSMTS program and submitting appropriate parameters.

CFSMTS provides a statistical printout, on demand, showing any overlap that has been gained. These figures show an occurrence count and the elapsed time that 'n' transient areas were active concurrently. A summary of elapsed savings is also calculated both in terms of time saved and its percentage.

Supervisor Prerequisites:

CFSMTS requires an addition to the standard DOS/VS supervisor; however, this modification contains no executable code. This addition simply reserves space for the additional transient areas.

Hardware Requirements:

The CFSMTS program to activate the Multiple Transient Support requires either a virtual or a real partition of 32K in which to run. This program is executed only to activate Multiple Transient Support and to print the accumulated statistics.

CFSMTS is available from CFS, Inc. as a licensed program product and may be leased monthly, yearly or on a one-time lease arrangement for $130.00, $1,425.00 and $4,275.00 respectively. All three lease plans include maintenance and support for as long as CFSMTS is installed.

Send requests for CFSMTS to CFS. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:

Director of Marketing
CFS, Inc.
1330 Boylston Street, Suite 608
Chestnut Hill, Massachusetts 02167
(617) 566-0222 Telex 94-0285

ADAPSO SOFTWARE INDUSTRY ASSOCIATION

Users Losing Security Game

(Continued from Page 25)

the memo. Why? Because the staff is leaving them all over the place for anybody to look at. How about spending a hundred bucks for a wastebasket-mounted shredder? No. That's not on the authorized equipment list.

Install a software fix to obliterate the password? Nope, other things demand the time. Look around you. How many passwords are affixed to the bulletin board: "TODAY'S PASSWORD IS XXXX."?

"Protect the data," the memo said. Is that why all those programmers have tapes in their unlocked desks? Is that why data entry has tapes that have never been degaussed? Is that why operators would prefer to pull the systems pack and leave the customer master?

"Protect the access to the computer room," the memo said. Is that why the words "DATA CENTER" are prominently displayed on the outside of the room and possibly the building? Is that why the doors are propped open for easy access?

"Control the communications lines," the memo said. Is that why the computer number is only one digit from the organization's main telephone number?

Despite our best efforts, computer centers are still being bombed somewhere in the world. Programs and data continue to be ripped off. People continue to use systems to divert organizational funds into their own pockets.

And all we do is REACT! Lock the barn after the horse is stolen. Why? Because we don't have one iota of a concept of what one single piece of data is worth, what two pieces of data taken together are worth or, what a file is worth to the organization that must rely upon the data.

The establishment of standards by the criminal element may seem invisible, but it is very real. Someday somebody will write a book of standards for computer fraud and abuse. But in the meantime, we should recognize that these people are doing for us what we haven't been able to do for ourselves: They are writing a very comprehensive set of systems standards, dollar by dollar.

Random Notes

Reports Enhanced In 'Maps' Update

PALO ALTO, Calif. — A generalized software package, enhanced by Ross Systems, Inc., offers financial modeling and report formatting capabilities to users of Digital Equipment Corp. PDP-11s running under RSTS/E.

Version 3 of Maps has a built-in data base capability, using DEC's RMS-11K facilities, to maintain data on a large number of organization units on an Isam file, a Ross spokesman explained.

Written in Basic-Plus 2, Maps creates its output from matrix descriptions of the rows and columns desired. Additionally, the package has the ability to answer "what if" questions as well to perform consolidations, the spokesman continued.

The package is available on a time-sharing basis; alternately it can be licensed to operate in-house on a single CPU for a one-time fee of $15,000, Ross stated from Suite 208, 1900 Embarcadero, Palo Alto, Calif. 94303.

Money Risks Eased With Infonet Services

EL SEGUNDO, Calif. — Computer Sciences Corp. (CSC) has added a series of petroleum and mining investment programs to its Infonet time-sharing service.

The programs were developed by Data Research Associates, an international consulting firm. They enable users to determine the financial risks, profitability and capital requirements associated with mining and petroleum ventures, according to a CSC spokesman.

The service includes petroleum and mining investment analysis, risk analysis of oil and gas reserves, a history of federal offshore lease sales and a data base of costs for offshore exploration and development activities.

The service will be continually updated to keep abreast factors affecting economic analysis, the spokesman noted.

More information is available from CSC at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

Already Four Years Old

T/S Users Group Marches On

By Don Leavitt
CW Staff

BOULDER, Colo. — The time-sharing remote comouting business appears to be growing 20% to 25% per year. Although the Association of Time-Sharing Users (Atsu) is not growing at a comparable rate, the group's executive director seemed pleased with its accomplishments during its four-year existence.

Hillel Segal acknowledged that Atsu experienced its greatest growth in the first year, when it counted 1,000 members, but he said the steady increase which has brought the present total to 1,500 should continue, especially as more people become aware of the association.

Atsu has grown mainly through its publications, he continued, noting it has no annual national conference and its chapters in many large cities have died out. However, members in New York, Chicago and Cleveland "and perhaps other" cities meet regularly.

The New York Chapter is planning a series of seminars this year and the program chairman has invited Kenneth Iverson — "the father of APL" — to speak.

The directories are clearly Segal's pride and joy. Building a part at a time, Segal and the now four full-time employees of the association have compiled a three-volume loose-leaf collection of reports covering a multitude of topics related to time-sharing.

The directory includes a listing of companies in the business, telling where they are headquartered, what they feature in service, what their limits are and how users can reach them. Moreover, Atsu lists available services by geographic region, indicating local office locations and available phone numbers for access.

Packages Detailed

The largest portion of the directory provides one-page write-ups of various classes of application systems that are available from individual vendors. Since the same service may be available from more than one vendor, this approach may give users an insight into the vendor's perception of what they are offering, Segal noted.

Data bases maintained by outside organizations may be of great benefit to time-sharing users, and the Atsu directory includes what Segal "modestly" considers the best compilation of information available about these data bases.

Currently under development is a section of the directory that Segal said will provide "as much detail as we can get," on terminals.

Support for the members is also provided with a series of benchmark experiments run by Real Decisions, Inc. of Westport, Conn., in conjunction with Atsu. In these tests, standard programs are executed on different networks to determine which handle different kinds of work best or least expensively.

While Real Decisions sells its test results to anyone interested in them, they are provided free to Atsu members.

Although Atsu has never run its own annual meeting, Segal said he is talking to sponsors of various established conferences to see if the association might usefully develop and run specialized technical sessions for them. He declined, however, to name the shows he has contacted.

The industry does provide backing for Atsu, he said, pointing to the present 35 corporate sponsors, all of whom are time-sharing/remote computing vendors who pay a substantial price to belong.

Individual memberships — at $20/year — include the association's monthly newsletter and the Real Decisions benchmark report. The directories, which are updated completely at least once each year, cost an additional $65.

Atsu is based at 75 Manhattan Drive, Boulder, Colo.

IBM Backs Cobol on Series/1

ATLANTA — A pair of packages is now available from IBM's General Systems Division to support the development and execution of Cobol programs on the Series/1 minicomputer. Neither package is a program product with centralized IBM support.

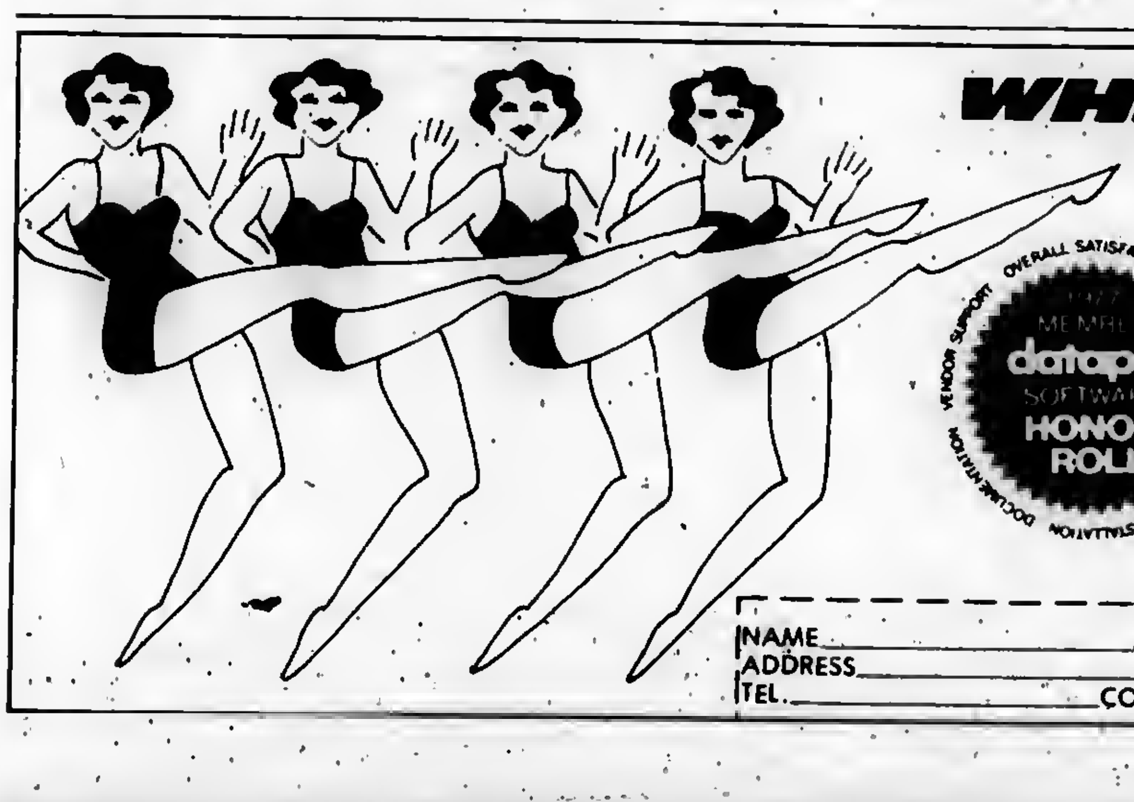
An Installed User Program, the Series/1 Cobol Subsystem Compiler provides the classic business-oriented facilities of the language plus the capability of calling assembler and other Cobol subroutines to handle logic outside the scope of the calling program.

According to a spokesman, the Series/1 Cobol Runtime Monitor is a Field-Developed Program that provides the interface to the Real-Time Programming System and controls the virtual storage environment for user Cobol programs. A set of assembler subroutines are included to provide full screen control of the IBM 4978 or 4979 display station, he added.

The Display/JCL Monitor is another part of the Runtime Monitor. This set of modules executes the commands entered through the Cobol program, or the CRT; it aids the programer by displaying a menu of possible operations.

The Cobol compiler, developed by Advanced Software Products, Inc. of Arlington, Va. [CW, Jan. 17], was designed according to specifications of ANS Cobol-74 "as understood and interpreted by IBM as of September 1978" with the exception of the RERUN clause, he continued.

The compiler — identified as product 5796-NPW — will be available Nov. 17 for a monthly charge of $310, with payments waived after 12 continuous months. The Runtime Monitor — product 5798-NTF — will be available at the same time for $40/mo; its payments, too, will be waived after one year.



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Package Runs Multiple Payrolls and Personnel

ANDOVER, Mass. — Users with IBM System/3s or DOS-oriented 360s and 370s have another payroll/-personnel package to consider: Payroll Plus from Software International. The system is said to allow multiple earnings and deduction categories with user exits for special calculations.

Employee and employer tax calculations to meet requirements at the federal, state, county and even city level are built in; and changes in tax laws are taken care of by the vendor.

Payroll Plus can manage different payrolls, each running independently — perhaps with different frequencies — in a single processing run. Yet the system maintains complete reporting and audit control for each payroll as if it were running alone, he claimed.

The personnel information base includes standard data as well as salary and job histories for multiple job changes. Personnel reporting includes outputs for workmen's compensation, bonding and Equal Employment Opportunity requirements.

Different methods of pay along with checks that are either system-generated or manually prepared can be handled with Payroll Plus. Both special-purpose checks and voids are routinely managed with complete auditability, the company said.

The system is said to establish comprehensive control of labor costing. This support is available as required, whether or not Software International's general ledger interface is being used: the interface can assign account numbers for earnings and deduction categories, the spokesman added.

The report writer portion of the package includes a library of standard reports as well as a facility enabling the user to create specialized reports.

The standard report library includes tax reporting with 941 (quarterly and annual) and W-2 forms, payroll and tax registers (detail or summary) and employee history information reports.

The Payroll Plus system requires 54K bytes of memory and costs $17,500 for DOS users or $12,000 for those on small systems such as the System/3, Software International said from 2 Elm Sq., Andover, Mass. 01810.

'Safes' System From ICL Aids Factory Management

E. BRUNSWICK, N.J. — U.S. Manufacturers with ICL, Inc. System Ten/220 CPUs can now acquire the Safes software modules from any of the vendor's offices to support their factory management operations.

Developed in the UK and marketed there for the past two years, Safes includes five modules which can be used individually or collectively as part of an integrated approach to a range of problem areas which are obviously interrelated, a spokesman said.

A bill-of-materials processor is one of the modules. Costing, inventory control, material requirements planning (MRP) and work-in-progress are tracked and managed by the other four modules, he explained.

Intended for small to medium-sized firms or subsidiaries of large organizations that require local support, the Safes approach "does not attempt to change the way a factory is run. Instead, it offers fresh information, online, so that managers can make well-planned decisions," the spokesman continued.

The bill-of-materials processor is said to process 10 levels of parts explosion, providing indented listings for standard output and a report generator — supporting arithmetic calculations, file updating and runtime entry of values — for customized or one-time printouts.

The costing module provides a classic pyramid costing of all items at standard and current cost and also features a submodule that can project costs and their impact on operations and profits, the spokesman asserted.

The extended MRP module is said to provide a bill-of-materials explosion to produce manufacturing and purchasing schedules from known demands or forecasts. It accounts for stock on hand, stock due and part leadtimes, ICL claimed.

The cost of the complete five-module Safes is $20,000; individual modules can be purchased for prices ranging from $2,500 to $5,000. Ten days of on-site training, documentation and a 90-day warranty are included, ICL noted from 197 Highway 18, E. Brunswick, N.J. 08816.

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DBMS Backs Research in Canadian Orchards

Special to CW

KENTVILLE, N.S. — When the Canada Department of Agriculture Research Station here found itself buried in fruit statistics and with no way to efficiently keep historical record data on fruit production, it turned to a software company for help and got it.

The Tree Fruit Record System now keeps track of all planting, pruning and picking of fruit grown in the research station's experimental orchards. The Annual Insect Injury System monitors the level of insect damage to apples throughout the apple-growing area of Nova Scotia on an ongoing basis and also contains data for the last 25 years.

Both systems are based on Data Boss/2, a data base management system from Florida Computer, Inc. that runs on Digital Equipment Corp. PDP-11s under RSTS/E.

Inventory File

Central to the Tree Fruit Record System is an inventory file showing location, species, variety and strain as well as pruning, fertilizer and other experimental treatments for each of approximately 12,000 fruit trees.

Historical data to be included in the system covers one orchard planted 40 years ago and many as much as 15 years old.

Ad hoc report requirements may now be satisfied on-line in a simple format, without additional programming.

For years, the researchers had to rely on manual methods of recordkeeping for their expanding experimental orchards. Now, using five data bases, the station is able to record up to 30 different entities regarding each of some 1,100 strains of apples, pears, peaches, plums and cherries on 52 rootstocks. The record system also produces turnaround forms custom-designed for each individual orchard.

Automated data management is more important than ever, since in a 10-year period the research station's orchards have increased from 5,000 to more than 10,000 trees.

With the Tree Fruit Record System, researchers are much better equipped to determine the optimal conditions for production of tree fruits and to determine the long-term effects of experimental treatments, according to G.L. Brown, biometrician at the station.

"The system has allowed us to store and manage our data, whereas before it was extremely difficult to recall, and almost impossible to measure, the progress of so many different strains of fruit grown under such a wide variety of conditions," he explained.

The system interfaces with the research station's own Comfast statistically oriented data base system. Users may specify data to be retrieved in a flexible, conversational manner, and the system will automatically load the data into Comfast format, ready for the plotting of graphs or statistical analyses.

Data Entry Chores Eased on PTS/1200s

NORWOOD, Mass. — A software package that provides data conversion and editing capabilities for Raytheon Data Systems Co.'s PTS/1200 Mark-I and Mark-II systems is now available from the company.

The Source Data Entry (SDE) package is intended to let DP novices develop and execute tasks on distributed processing systems that are primarily used for IBM 3270-type interactive tasks, remote batch processing, local processing and report printing functions in a data communications network, a spokesman explained.

Seven Features Touted

Seven distinct features were cited by Raytheon as capabilities that make SDE "ideal" for remote sites with a mixed workload: automatic-cursor positioning; table lookup; reasonableness checking; arithmetic computation and crossfooting; batch balancing; record searching by multiple keys; and record insertion and deletion.

SDE users can also program specialized subroutines using the PTS/1200's Macrol language, the spokesman noted.

SDE is included in PTS/1200 systems at no extra charge, Raytheon said from 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

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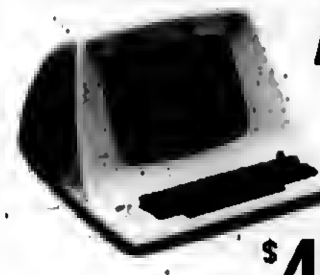

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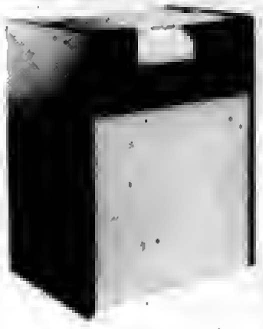

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SBC's 'Escort' Aids Distributors

GREENWICH, Conn. — A system designed to shorten the order entry and confirmation cycle for distributors and manufacturers, especially those in the electrical business, is now available through the remote computing facilities of the Service Bureau Co. (SBC).

The Escort service, developed by SBC in conjunction with the National Association of Electrical Distributors (NAED), has been implemented on the network's Call/370 facilities. It can be accessed by a terminal in the user's office or linked to a larger user's in-house CPU, a spokesman noted.

For the service to be effective, both distributors and manufacturers have to be taking part and, as the spokesman emphasized, the more of each the better. If a manufacturer can get all its major distributors on the system, it can balance the service it offers; if a distributor can get all its manufacturers on Escort, it has an easier way to place all its orders, he explained.

In any case, there are security provisions built into the service so that orders and confirmations are accessible only by those parties who should be able to see them, SBC said.

To use Escort, distributors enter purchase order information. The entries are checked by the service for completeness and accuracy, and errors are corrected by the user before the entries are sent to manufacturers.

After the master purchase order file is updated, the orders are made available for access by manufacturers. These firms, in turn, enter their confirmations following the same pattern of entry-edit-error correction used by the the distributor.

The system can easily handle multiple shipping and delivery points as well as different ship-to and bill-to addresses, the spokesman added.

Initial use of Escort is dependent on a one-time subscription payment of $1,000 to NAED. After that, costs vary depending on volume of use, subject only to a $100/mo minimum applied on a "per-contract" basis.

SBC's network is international in scope. The company is based at 500 W. Putnam Ave., Greenwich, Conn. 06830.

CICS Sessions Eased Under 'Intertest'

RIVER EDGE, N.J. — All versions of IBM's CICS/VS, including the recently released version 4.1, are supported under the symbolic testing facility to be available shortly as an adjunct to the Intertest package, according to the vendor, On-Line Software International.

Intertest/Symbolic provides a test bed for both Assembler and Cobol CICS/VS applications. With the new facility, users can set both conditional and unconditional breakpoints based on program locations identified by Cobol statement number or paragraph name or Assembler label, a spokesman said.

Prevents Crashes

Beyond that, Intertest/Symbolic prevents CICS production or test system crashes by monitoring any declared mix of programs, transactions and terminals or even the entire system, he said. Illegal actions are blocked before they do any damage, he added.

A dynamic patch facility permits insertion of blocks of instructions at any number of points in a program. This feature allows new code to be tested before permanent changes are made in a program, the spokesman explained.

Two statistical functions are also available for monitoring test sessions.

Intertest/Symbolic costs $5,000, the vendor said from 65 Route 4 East, River Edge, N.J. 07661.

Credit Unions Backed With GA-Based Logic

LIVINGSTON, N.J. — Credit unions can run a lot of their own DP on General Automation, Inc. Model 220 minicomputers if they have a software system developed by and now available from System Generation, Inc., according to a vendor spokesman.

Written in Cobol, the package includes such applications as positive tape payroll, a totally integrated general ledger accounting and share draft processing, he reported.

The system has been field tested for more than six months. It operates under modified General Automation Control III software and supports up to four CRTs.

Cost of the basic system including a GA 220 varies with the facilities required but starts at $39,187. The software by itself costs $7,500, he said from 513 W. Mt. Pleasant Ave., Livingston, N.J. 07039.

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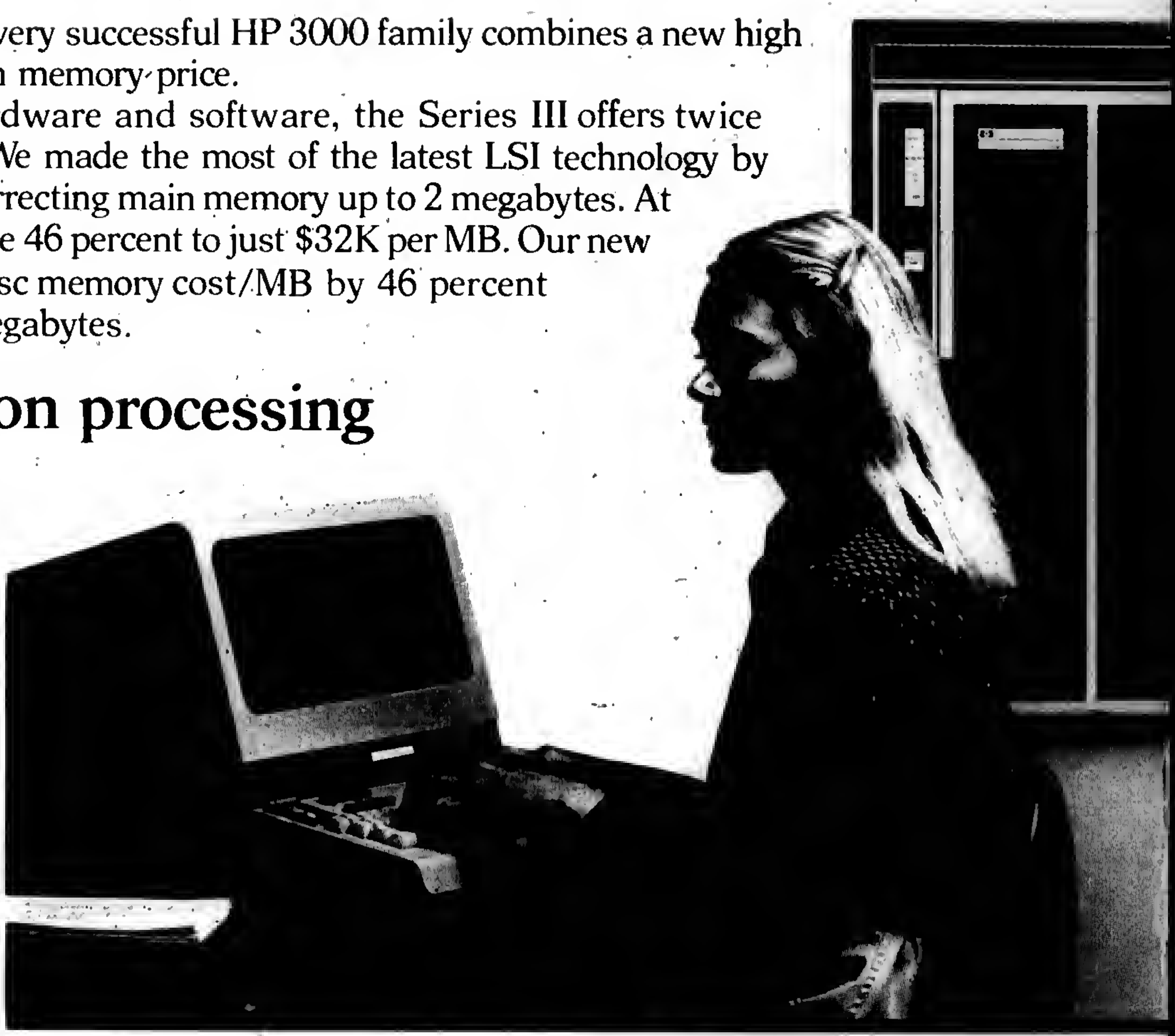

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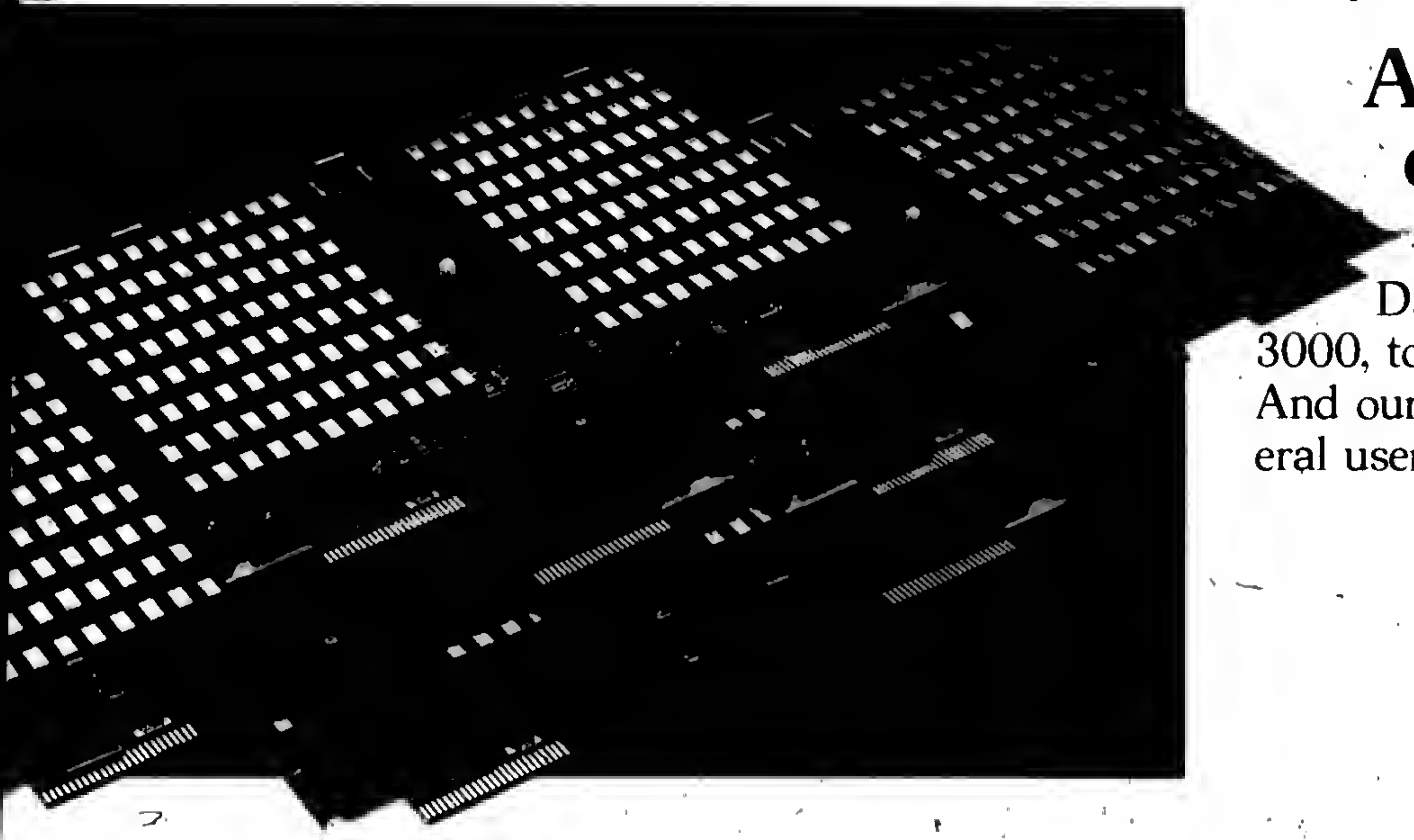

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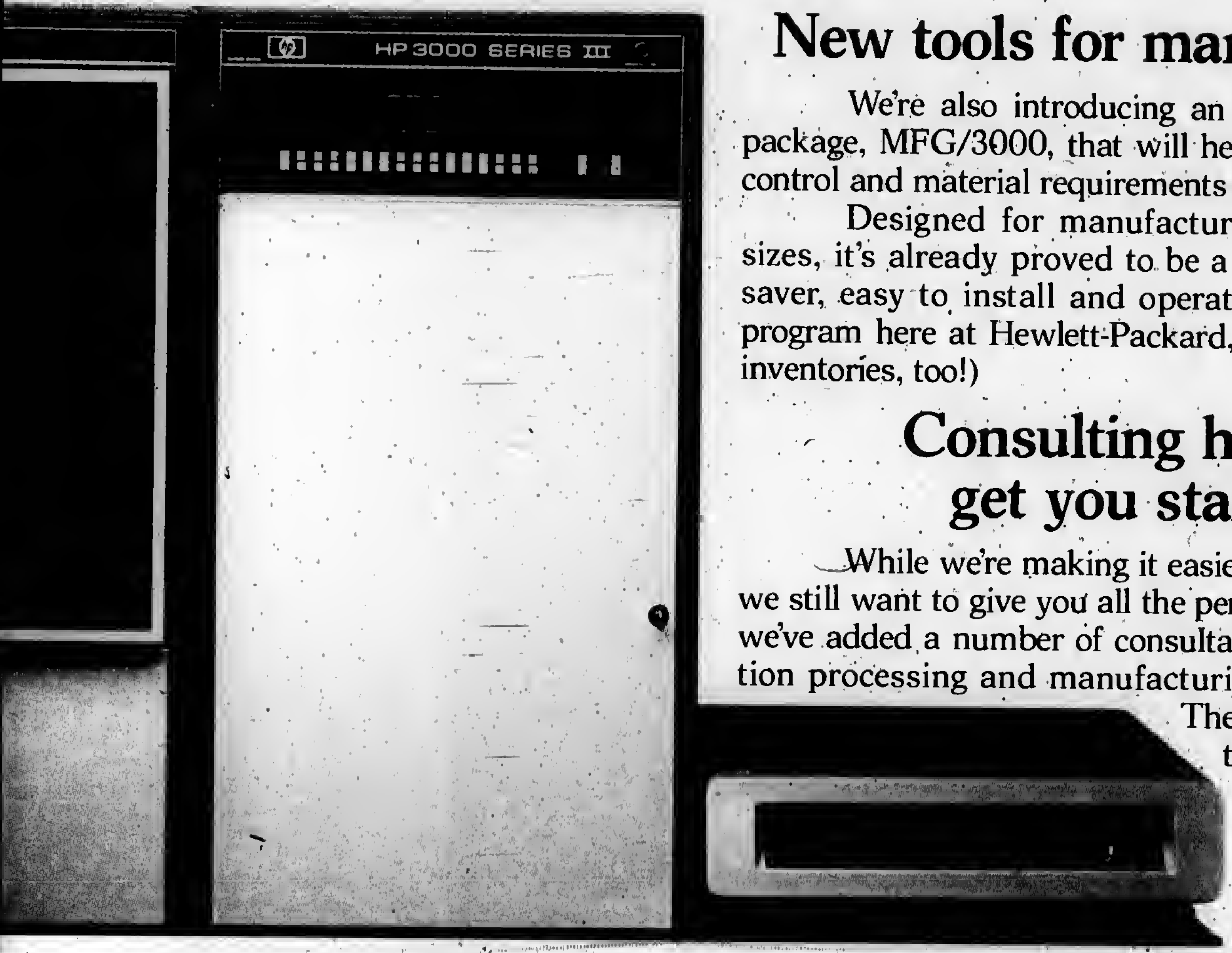

A new feature of DS/3000, our networking software, gives you easy access to remote data bases. For a large company, this can obviously lead to a much more efficient distribution of data, as well as making management information even more speedily available than before.

New tools for manufacturers.

We're also introducing an applications software package, MFG/3000, that will help shape up inventory control and material requirements planning.

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Five Years of Work Pays Off

BLS Ties Table Compilation, Photocomposition

By Rudolph C. Mendelssohn
Special to CW

The people who do tabulations at nearly 200 computer centers around the world may speak English, Hungarian, Hebrew, Arabic, French, Finnish or Thai. But they have a second, common tongue: they all use a unique language that tabulates and displays numerical tables by computer line printer or an electronic photocomposer. It is called Table Producing Language (TPL) and is the result of five years of innovative work by the Bureau of Labor Statistics (BLS) of the U.S. Department of Labor.

Most users of TPL are in commerical enterprises throughout the U.S. and Canada. These include banks, insurance companies, time-sharing services, heavy industrial manufacturers, pharmaceutical houses and research and planning organizations. But state and municipal agencies across the country and more than a dozen federal agencies (including both houses of Congress) are also users. Among educational institution users are a dozen major universities.

The count of TPL installations abroad shows 15 national statistical agencies, located mainly in Europe, but ranging geographically from North Africa and the Mideast to Australia and Thailand. United Nations installations in New York and Geneva use the system themselves and distribute it to member countries.

The American Statistical Association's Committee on the Evaluation of Statistical Program Packages, looking into 11 leading packages, studied two principal characteristics: tabulating power and simplicity of langauge. TPL was judged to be the best on both counts by a wide margin.

Differs From Cobol, Fortran

The new language differs from the traditional Cobol and Fortran in important ways. The latter have general application in the sense that they are used to solve a wide spectrum of problems in business and science — problems ranging from accounting, inventory and production to forecasting the weather and getting men to the moon. But the user must give the computer step-by-step instructions on how to solve the problem being presented to it. That means the user must know how computers work.

Most users except those in the computer sciences do not acquire this knowledge without considerable extra effort. In addition, "procedure"-oriented languages require that each task be dealt with as if it were without precedent. At one time, BLS programmers had to write a new computer program for each new table — a fairly expensive and restrictive requirement.

TPL belongs to an emerging class of very high level, problem-oriented languages — "very high level" because they are disengaged from the computer and "problem-oriented" because they deal with specific problems. Early efforts created systems called Strudl and Stress to help structural engineers solve problems of structure and stress in building bridges. In another instance, a language call Coordinated Geometry (CoGo) helped develop the unusual design and construction of the Watergate complex in Washington, D.C.

Specific Focus

TPL has limited application — it can only tabulate data and display results, nothing else. On the other hand, this specific focus has allowed the embodiment of several advantages over the better known traditional, but less specifically directed, languages.

First, the TPL system, a problem-oriented language, already knows what a table is and how to generate one. It only needs to be told the particulars about the specific one wanted. Thus, when describing the desired table with TPL, the user need not go through the tedious and time-consuming effort of telling the computer, step by step, how to make tabular calculations and lay out a table framework.

Moreover, TPL allows BLS social scientists who are not computer experts to use the everyday common BLS language and nomenclature to describe the tables. In short, TPL has reduced a burden, speeded work and increased the BLS capacity to respond.

Print Control Language

TPL serves table production apart from speeding tabulation. It is always helpful to have the results of TPL well structured and labeled for easy use in production and analytical tasks. For this purpose, the numbers must be

(Continued on Page 38)

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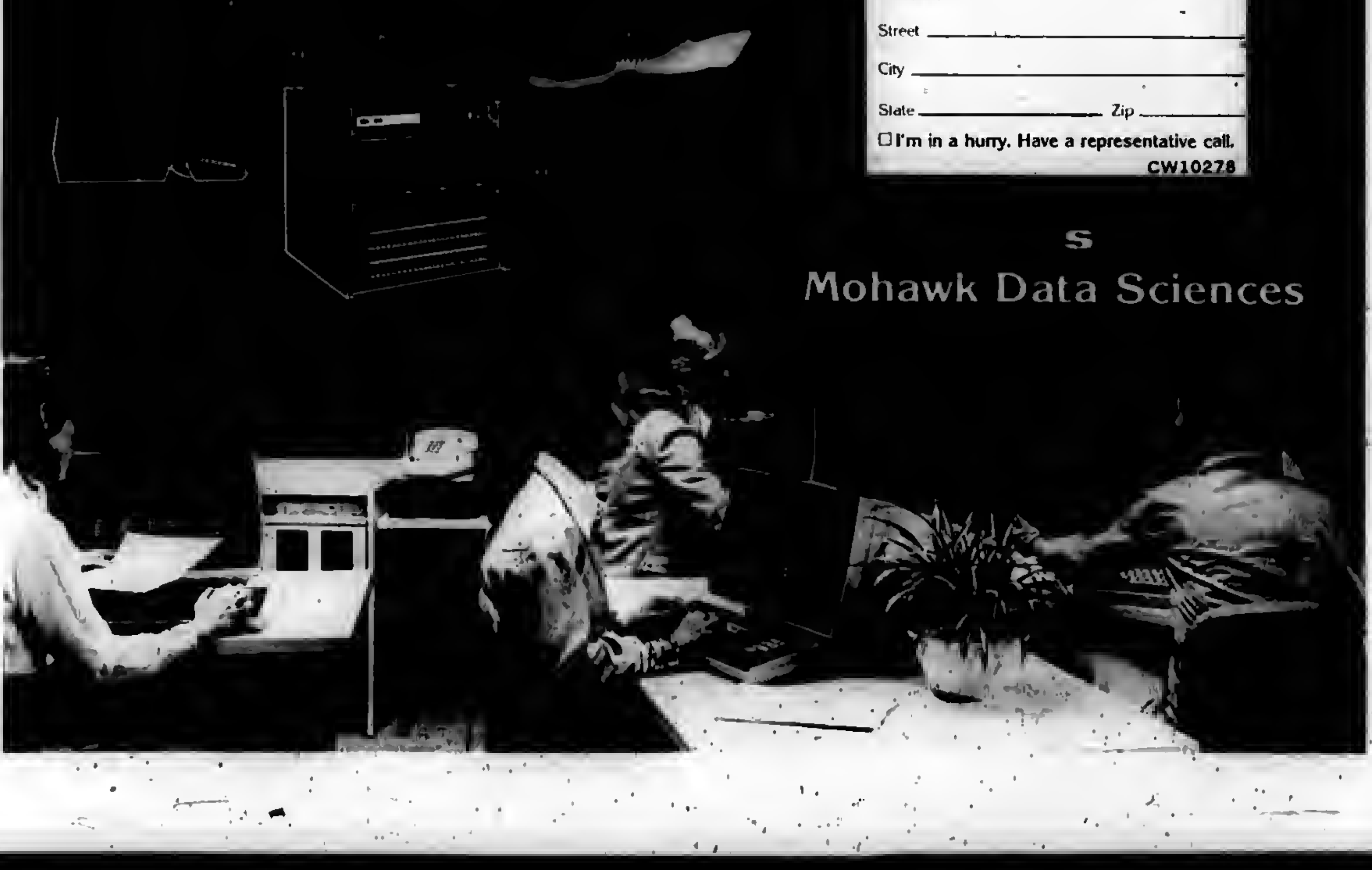

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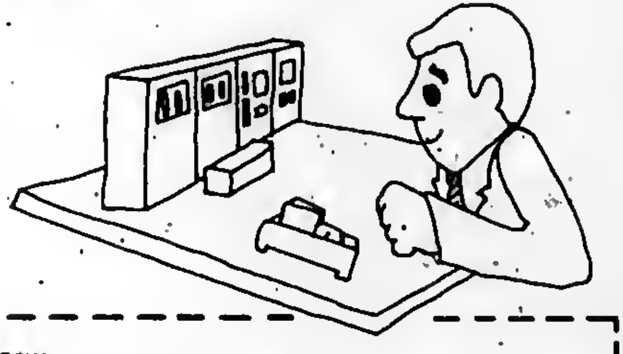

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Table Handling, Makeup Tied in Operation at BLS

(Continued from Page 36)

surrounded with a clean and concise framework of explanatory alphabetic information, such as table and column titles; box heads and horizontal rules so that data will make sense and be readable.

For publication, the requirements are more severe and the display facility has been extended to meet these needs. It is called the Print Control Language (PCL). Through PCL, the user can specify column and stub widths and insert his own alphabetic labels for each variable as well as footnotes and other text. Decimal points and special symbols, such as dollar signs, are available.

There are options for hyphenating and centering titles, placing more than one table on a page and having headings span the body of a table. Options also include vertical position control, indentation of footnote text and other subtle features for alphabetic displays that help make tabular material sensible and easy to read. Taken together, these features can create tables that are acceptable for direct photo-offset printing by BLD in its periodicals and bulletins.

Composition Common

Electronic photocomposition of text has spread rapidly in the printing industry and is now commonly used in publishing newspapers, books and journals because it is cost-effective and speedy.

Ordinarily, it is driven by a magnetic tape containing compositor instructions formed by a Linotron Master Typography Program (MTP), which provides the codes for font style and boldness as well as other information such as page number, paragraph and other indications associated with each character in the text being set.

The Linotron MTP is text-oriented. Because the format of text on a printed page often does not differ in basic ways within the same publication or even from publication to publication, it is practical to prepare the computer programs needed to create the text image thoughout MTP.

On the other hand, table production by Linotron in the past required a computer program for each table format to be printed. For BLS, this was an impractical task for several reasons.

First, the variety of BLS tabular presentations is unpredictable and practically unlimited.

Second, BLS journals, pamphlets and other standard periodicals contain a mixed format.

These barriers have been overcome by extending PCL to drive photocomposers. Because it is a generalized tool to format tables, the need to write tailored programs to generate editorially acceptable tabular display using the line printer had been removed.

For photocomposition, there remained the task of assigning compositor commands to each character and symbol that was to appear in the table. For example, these commands define details of the table framework such as style and size of type wanted, underscoring, column width and horizontal and vertical rules.

Like BLS, the U.S. Naval Observatory has a mandate to print masses of information in tabular form. And, fortunately for BLS, the expert systems staff at the U.S. Naval Observatory's G.W. Hill Computer Center found a path that bypassed the need for programmers to become familar with the MTP and the way Linotron works.

Staff members developed the Fortran Automatic Typesetting Systems (Fats), which has been designed for users who have little knowledge of printers' terminology, procedures or measures and who wish to print mostly tabular data. User-written Fortran (or PL/I or Assembler language) main programs call on subroutines programmed into Fats to generate the necessary Linotron codes that are then written onto tape, together with the data for display.

While Fats was a major step forward, only programmers can use it. Because it was the intent of BLS systems staff to remove the requirement for programming skills to generate Linotron tables, all that remained was to join PCL and Fats. This has been done.

Now, the facility comprises all of the wide-ranging PCL capabilities plus opportunities for typographic enhancements via electronic photocomposition. These include choices of font style and boldness and size of type; boldness in vertical and horizontal lines and underlining rows to indicate totals or so.

Users of the PLC photocomposition capabilities can publish tables that appear to be typeset. In other words, they are of high visual quality. But the greater cost of mechanical typesetting need not be undertaken.

The Goverment Printing Office added the RCA Videocomp to its line of photocomposers not long ago. It is now available on a wide scale at the printing office and elsewhere.

The TPL/PCL photocomposition software was designed to be as independent of the special features of the Linotron as possible. It was relatively easy, therefore, to couple PCL with the newer Videocomp machine and give the BLS greater flexibility.

The approach was different, however. In this case, the Fats routines could not be used because they were keyed to Linotron. Instead, the bureau's systems staff developed the equivalent of a subset of Fats, consisting of only those routines needed to meet bureau requirements.

For those interested in a conversion project, the principal areas of difficulty would be in adaptation of the units of measurement that specify the size of type and the nature of the photocomposer language to the new photocomposer. A reasonable estimate of the time needed to create an adaptation to another photocomposition system that had no unusual features would be two months. However, depending on turnaround time for testing and the quality of documentation of the target photocomposer, this could extend to four months or a year.

These speculations about time required for conversion do not include the time required to learn how the TPL/PCL system works. This is estimated to be several months.

Mendelssohn is assistant commissioner, systems and standards, at the Bureau of Labor Statistics.

TP Monitor Makes DP Access Grow

By Tim Scannell
CW Staff

ATLANTA – The farming industry has come a long way from relying only on a handful of seeds, some soil and a little rainfall to yield a successful harvest. Today, complex chemical fertilization procedures are as important to the industry as crop rotation patterns and planting schedules.

D.M. Weatherly Co. is an international chemical engineering contractor specializing in the operation of fertilizer production plants. Consequently, the company's version of "getting back to the soil" is thorugh such "tools" as nitric acid and diammonium phosphates rather than shovels and hoes.

Reacting to the farming industry's continual scientific growth, D.M. Weatherly recently upgraded its DP system by installing a teleprocessing (TP) monitor and related software. The current system, which supports 11 terminals distributed around the plant, has reportedly increased the engineering staff's programming flow by 1,000% and accommodated the firm's blossoming interest in farm-related chemical research and development.

The firm originally used an IBM 360/30 that was plagued by numerous backlogs because of the engineering staff's limited access to the CPU. Engineering runs or computer programs were limited to a maximum of five per day under that system, according to Bruce Weatherly, vice-president of purchasing and finance.

"We were operating in an environment of poor utilization of computer resources," Weatherly said. "The prime engineering function . . . and our expediting and accounting information was not available to the users in a timely manner."

Company officials decided to explore the possibility of using a series of terminals, dispersed around the plant, to allevi-

(Continued on Page 43)

Key Unknown to All

Motorola Extends DES Key Management

By Brad Schultz
CW Staff

SCOTTSDALE, Ariz. – A major vendor of encryption hardware based on the federal government's Data Encryption Standard (DES) algorithm has introduced a means of generating and using encryption keys without human knowledge of their definitions.

The Government Electronics Division of Motorola Semiconductor Products, Inc. has added the DES4100 KGM key generator and the DES4100 KLM key loader to the Infoguard line of DES-compatible security products unveiled last winter [CW, Jan 9].

From a security standpoint, key management is perhaps the most crucial aspect of data protection by encryption because the key – a numeric character string – defines the codes by which data is "scrambled" prior to transmission and unscrambled upon reception.

"In an encrypted data communications network, each protected line will have an associated unit number and address under which encrypted keys are stored in the key generator's nonvolatile semiconductor memory," a Motorola spokesman explained. "The key generator will permit an operator to designate from a keypad which keys shall be generated for which units – but not the keys themselves."

These keys "will be produced by the key generator and stored within its own control memory – 'inaccessible' to the outside."

The key loader is a microprocessor-based, hand-held device interfaced to the key generator and network security module (NSM) through "electro-optics" comprised of a photo transistor and LED located on top of the unit. The portable device is capable of storing 32 different keys; with optional memory, it can sort up to 256 keys, the spokesman said.

"If either the front or rear panels [of the loader] are removed, tamper switches are activated, cutting off power, 'zeroizing' all memory [and] eliminating all keys stored. Likewise, if the key loader is interfaced to an unauthorized NSM, the keys are zeroized," he noted.

A key generated by the key generator is loaded into the key loader, which then sends this data to the NSM. This module is the point at which the key is applied to the task of scrambling outgoing "plaintext" – the ac-

(Continued on Page 42)

Split-Platen Printer Merits Attention in Business World

By Barry I. Kelman
Special to CW

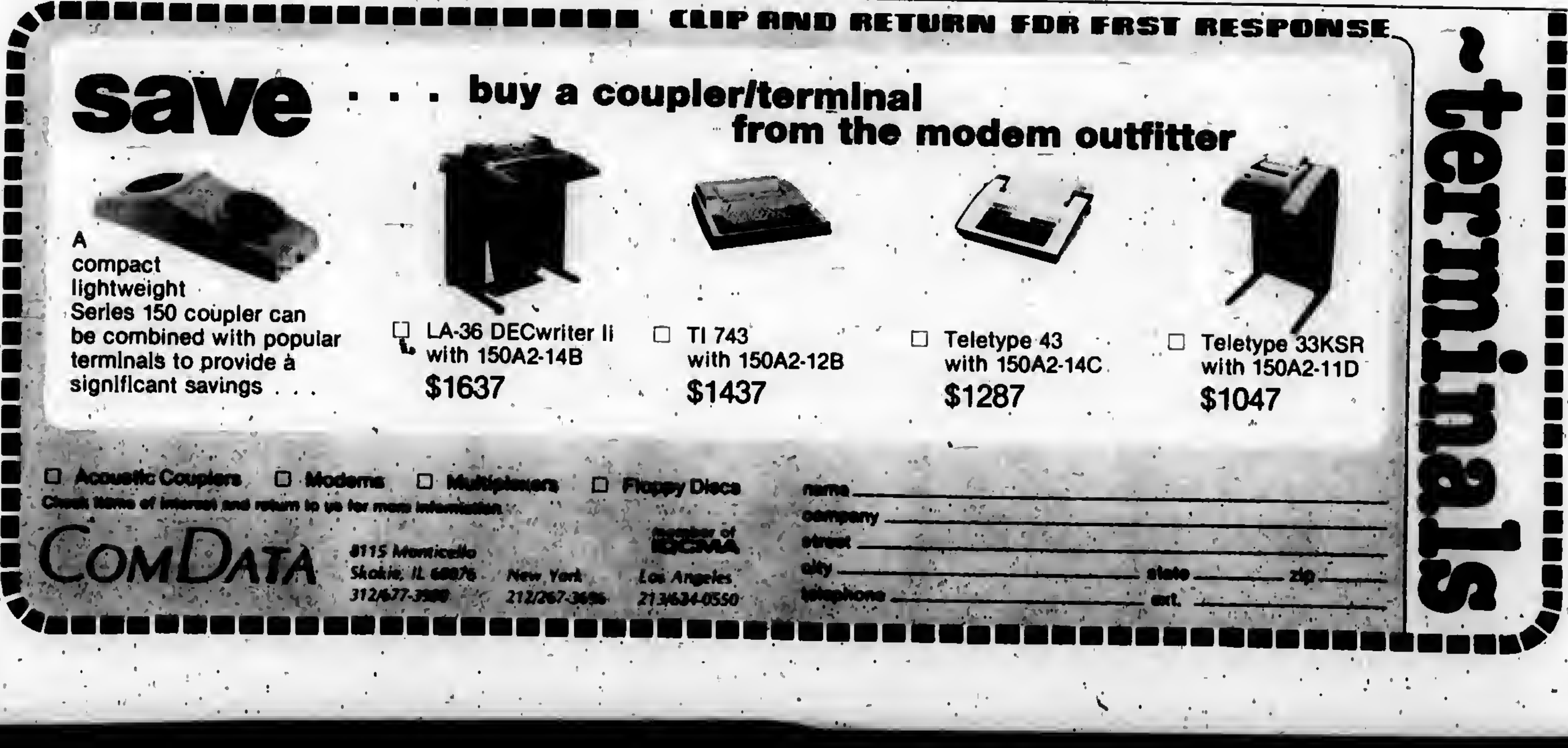
The business community has, for years, ignored a product that promises productivity and throughput increases. That product, according to author Kelman, manager of software development at Perkin-Elmer Data Systems' Terminals Division, is the split-platen printer terminal.

Terminals which are capable of alternately printing two documents without requiring an operator to load and reload each form have been around for many years. They are especially popular in savings and loan, mortgage banking and stock transfer applications.

Other specialized applications, such as printing documents at automobile rental agencies, also use split-platen printers. But for some reason the terminals have not been widely accepted elsewhere in the business community.

As an inexpensive laborsaving and timesaving device in a warehouse or distribution center, where multiple sets of multipart forms are consistently used, split-platen printing terminals would seen to be an obvious choice. It is a simple task to set up a split-platen terminal with both packing lists and shipping labels, for example. The user would save quite a bit of time, especially if those are the only forms regularly printed at

(Continued on Page 40)



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Split-Platen Terminal Printer Merits Attention

(Continued from Page 39)

the terminal.

A typical distribution system uses picking tickets, packing lists and shipping labels. In this system, orders are received by phone, entered into the computer and transmitted via communications line to the warehouse terminal.

However, before the terminal can receive orders, a telephone call to the terminal operator is often necessary to make sure the proper forms are loaded. On the other hand, the first printed message at the terminal location may be a forms alignment/setup message.

In either case, time is lost until the proper forms have been located and loaded or verified as already being in the printer. The problem is worse if the operator is a clerk who is unfamiliar with computer peripherals.

Eventually, a batch of orders is transmitted and printed on a multipart form which consists of a picking list, a packing list, an invoice copy and, usually, a few more copies for salesmen and the files.

When the orders finish printing, the operator must be alerted again to change the forms, this time mounting the shipping labels. A batch of shipping labels is subsequently transmitted and printed.

In this system, a user must batch orders and shipping labels separately unless he has an expensive, custom form that combines both.

The terminal operator is constantly changing forms and, when is busy at some other task, the host computer must wait for the proper form to be mounted in the printer. The result is inefficient use of the two most costly resources, the CPU and the operator.

First Benefit

To a shipping supervisor who always seems to be waiting for his orders or to a DP manager who can't seem to produce those batch orders fast enough, the first benefit of using the split-platen terminal is the possibility of having a true on-line system.

Since the terminal is dedicated to this application, always having the two forms ready for printing means the orders and labels may be transmitted whenever there are enough to justify an order run.

It doesn't matter whether one program produces the orders and labels concurrently or two programs produce the data separately; the main point is that there is no longer a need to wait for forms loading.

If a single-platen system is part of an on-line system that spools the print files for the orders and labels to disk or magnetic tape for later transmission and printing, those peripheral devices could be freed by using the split-platen terminal. Forms would actually be printed on-line, as they were prepared by the host processor.

From the programmer's and designer's viewpoint, programming considerations, printer controls and telecommunications are not very different for either type of terminal.

Low Overhead

The extra overhead is minimal. For example, "multicode" sequences direct the Carousel 350, a split-platen terminal from Perkin-Elmer Data Systems, to position the print horizontally and the platen vertically, to select either the left or right platen and to set the forms length and left margin position for the currently selected platen.

The multicode feature provides a special character which precedes all control sequences; thus, the multicode character followed by lowercase "i" selects the right platen; the multicode character followed by lowercase "o" selects the left platen.

Only the most recently selected platen is moved by vertical positioning commands such as Line Feed, Addressable Vertical Tab and Vertical Fine Increment.

Carriage Return moves the printhead to the left margin set for the currently selected platen. "Escape" is generally used as the multicode character; other characters are optional for those systems in which Escape must be reserved for other functions.

Length and Margins

The only additional overhead required is transmission of a short sequence to set the forms length and margin positions at the beginning of each run and transmission of the two-character platen selection sequence, once for each form.

When work is light, orders and labels may be removed as they are printed, and the two documents may remain together at all times. Multiple shipping labels could just as easily be produced for each order; it doesn't matter whether the order is one page long or 20 pages.

A similar procedure could be followed in a manufacturing environment. The printed documents might be the manufacturing schedules or work orders and the invoice set.

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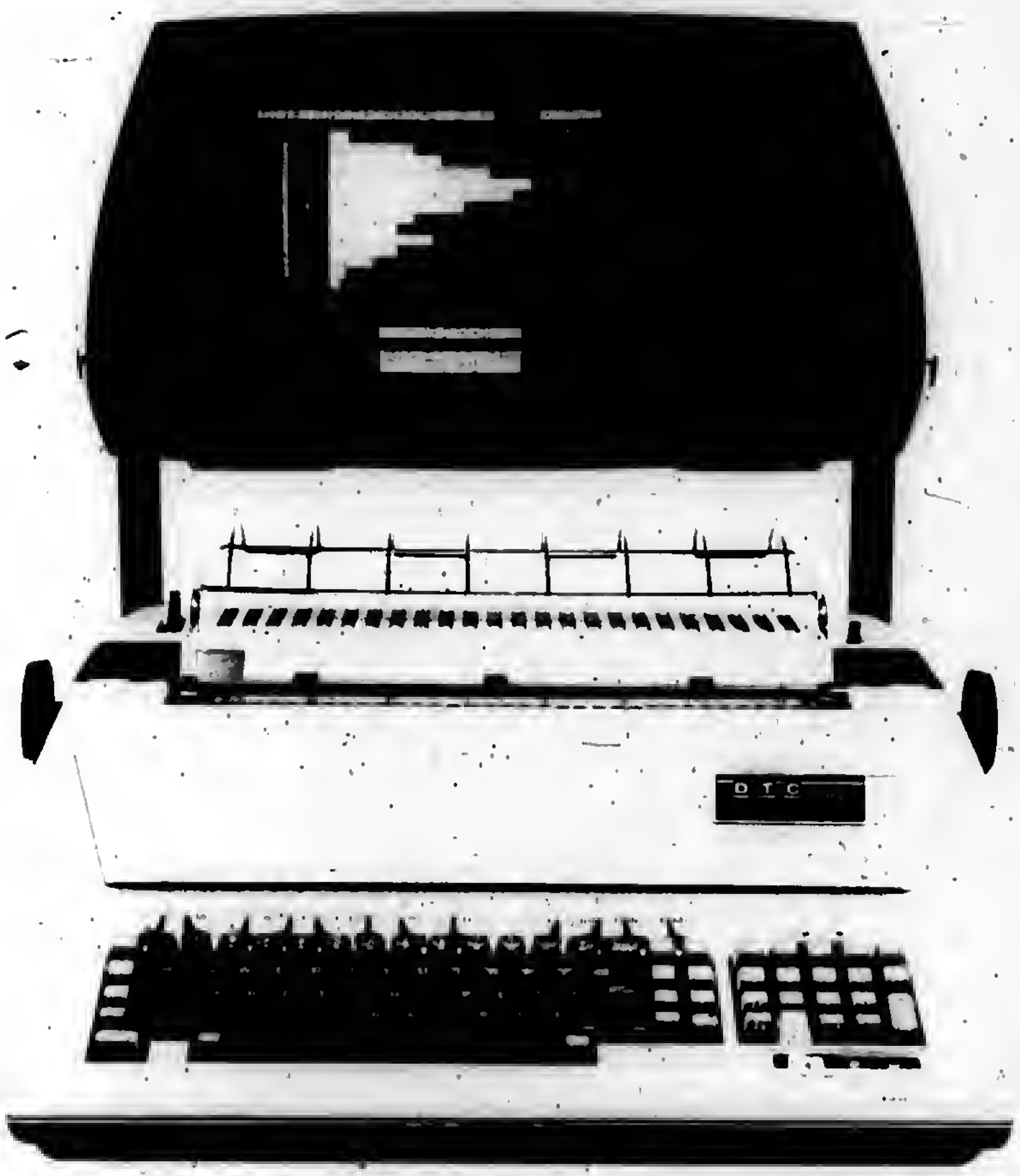

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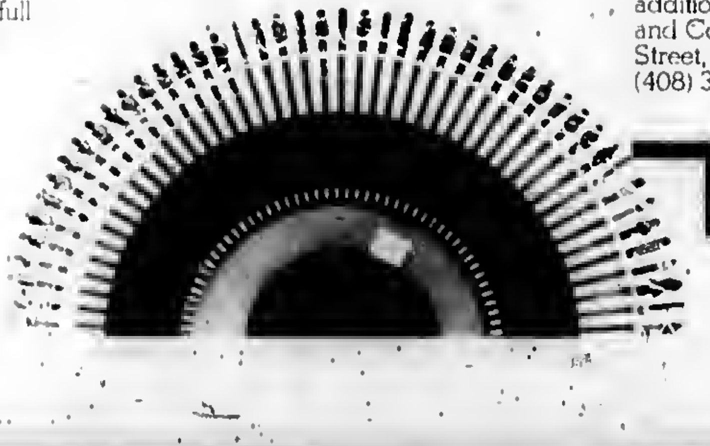

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ITT/CSS Starts Switched Private Net Service

NEW YORK — ITT Corporate Communications Services, Inc. (ITT/CCS) has announced a private coast-to-coast telephone network service intended to provide economical interoffice phone call rates for business and government users.

The Switched Private Network Service (SPNS) now serves 16 cities with additional connections possible anywhere in the continental U.S., according to ITT/CCS President J.C. Reynolds.

Users are connected to the SPNS service by a dedicated line from each calling location to the nearest computer-controlled ITT/CCS switching center, he explained. Customer calls from one location to another are then routed automatically over ITT/CCS-provided lines between seven switching centers.

The network now links Atlanta; Baltimore; Boston; Chicago; Cleveland; Dallas; Gary, Ind.; Houston; Los Angeles; Milwaukee; Newark, N.J.; Philadelphia; San Diego; San Francisco; and Washington, D.C.

Switching Centers

The heart of the network is its switching centers, which are composed of two technologically discrete parts: the switching CPU and the modular switch matrices. The solid-state switching CPU was designed to provide the customer with network basis, a company source said, adding that the switching CPU can access lines and/or trunk interconnections between the switching centers and the customer site.

A main switching and network control center for the network is located at One Whitehall St. in New York. This center allows status monitoring of all other centers in the network and the transmission facilities that link them, reportedly enhancing total system reliability.

The SPNS design minimizes the probability of blocking on trunk groups or through the switch, thus lowering the frequency of lost calls or regenerative attempts, the source continued.

Key switching elements are redundant to minimize equipment outage, the source said, adding that triple redundant power supplies support each switching center, providing battery and generator backup for commerical power consumption.

Service features planned for SPNS include enhanced data protection, detailed per-call billing, traffic statistics compilation, desk-to-desk dialing, abbreviated dialing, hotline service, conference calls and project billing for specific subbilling accounts.

Rates include $30/mo for each access line, a $150/mo minimum charge and 15.8 cent/min to 19.8 cent/min usage as a function of time and distance. In addition, there is a one-time installation charge of $100 per access line.

ITT/CCS, an ITT subsidiary, is located at One Whitehall St., New York, N.Y. 10004

Brochure Offered By Phone I

ROCKFORD, Ill. — A four-page brochure describing the functions and operating elements of Phone I's P1-5 data concentrator is available at no cost from the firm.

The document reportedly tells how "anyone" can enter data records through push-button telephones for "immediate" storage on computer diskettes. Phone 1 can be reached through P.O. Box 1522, Rockford, Ill. 61110

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Two Devices By Motorola Back DES

(Continued from Page 39)

tual data to be protected — or decoding incoming "cipher-text" — data already scrambled.

The critical virtue of the key generator is that generation is performed pseudorandomly — there is supposedly no perceptible "pattern" to the stream of keys produced, Motorola said.

DES critics have noted that if a pattern were perceptible, then a computer system employing current technology — albeit in an extremely sophisticated manner — could discover the definition of a particular key and thus be used to access the data encrypted by that key [CW, June 19].

The extent of human involvement with the key used in a transmission has long been recognized as a measure of that transmission's vulnerability to tampering. Proponents of the standard — developed by IBM and adopted by the National Bureau of Standards (NBS) last year — have therefore argued that key management without human knowledge via the DES algorithm can render unbreachable security.

"Since the NBS standard is a public algorithm," the Motorola spokesman said, "its security lies in the keys and key management, not in the secrecy of the algorithm. Key management is one of the most difficult problems with which cryptographic equipment users must deal.

"Motorola has analyzed the problems of key generation, key distribution and key insertion and has devised unique key management systems and products which provide users with more security for protecting their computer networks," he claimed.

A typical Infoguard network configuration would include one key generator, several key loaders and any number of NSM encryption devices, the spokesman noted.

The DES4100 KGM costs $6,500; the standard (32-key) KLM goes for $1,500, while the optional 256-key loader costs $1,900. Motorola's Government Electronics Division is at 8201 E. McDowell Road, Scottsdale, Ariz. 85252.

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Codabar Gains Visual Verification

DAYTON, Ohio — A Comparison/Verifier Terminal said to provide human-readable verification of scanned Codabar messages has been introduced by Monarch Marking Systems, Inc.

Codabar, a bar code similar to the Universal Product Code, is presently the "de facto standard" for library use, according to Monarch.

The terminal was originally developed for E.I. duPont de Nemours for matching and verifying the labels and contents of packing crates, according to a Monarch spokesman. It was "designed to be rugged" for use in industrial environments, he added.

The terminal is programmed to compare key-entered messages with scanned messages, which can be entered with a hand-held wand or a laser scanning head connected to the unit, the company said. When the two messages coincide, the terminal emits an audible signal.

If the messages are not identical, both are displayed on the terminal's 32-character, 5 by 7 dot matrix CRT.

The terminal employs a Motorola Semiconductor Products, Inc. 6800 microprocessor and comes with a 24-character keyboard consisting of 20 Codabar characters and four control functions.

The unit can contain a badge reader and provide a hard-copy record of key-entered and scanned messages when connected to a printer through its RS-232 interface, Monarch added.

The Comparison/Verifier Terminal costs $2,500, the firm said from P.O. Box 608, Dayton, Ohio 45401.

Hard copy made easy.

With the help of a high-speed microprocessor, Hewlett-Packard combines exceptional performance and convenience in a new low-cost printer and printing terminal.

The HP 2631A printer and HP 2635A printing terminal with alphanumeric keyboard are the first members of a new Hewlett-Packard family of hard copy terminals.

Each machine was designed to give you a number of high-performance features. And both can support a variety of interfaces, including RS232 and CCITT.V24, to fit into systems made by HP and other manufacturers.

Bi-directional printing increases throughput. Both printers zip along at 180 cps in both directions, depending on your line layout. The microprocessor chooses the quickest path, and increases the speed even more by suppressing leading and trailing blanks.

High-speed slew for columnar data. When the microprocessor senses more than ten blanks in a row, it slews the print head at 45 inches per second to the next print position.

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Three ways to print. The Character Compress/Expand Modes let you print more data on a page and emphasize points with headlines and titles. You can get as many as 132 characters on an 8-inch line, or 227 on a 14-inch line.

High-quality print, with six copy resolution. A 7 x 9 dot matrix (versus the usual 7 x 7) gives you clear, crisp printouts, right down to the sixth copy and meets the 128-character USASCII standard. And the extra two dot rows allow true underlining and descenders without character blurring.

Programmably interchangeable character sets. The HP 2631 can be made to print alternate character sets without reconfiguring the printer.

Long lasting, quick change print head saves service calls. The 9 wire print head is conservatively rated at a 100 million character life-span. It's also self-aligning. When you finally replace the head, you can do it yourself in a couple of minutes.

Long-life cartridge ribbon for a clean change. With a life span of at least 10 million characters, this innovative drop-in cartridge takes the mess and trouble out of ribbon changes.

Self-test for quick status checks. One key tells you if the printer is ready to go. If it isn't, the self-test feature helps you isolate the problem, reducing the time and cost for repairs.

Run everything under program control. All the features described and more can be programmably controlled. The software can take you in and out of the various modes. Or you can make a change yourself using one of the front panel switches or keys.

In a network or as part of a stand-alone system, HP now makes it simple to get the hard copy you need. If you'd like to see our printer or printing terminal in action, call the Hewlett-Packard sales office listed in the White Pages and ask for a computer systems representative. Or send us the coupon.

46701HPB2

Seminar to Eye 'IBM: The Next Five Years'

NEW YORK — The Yankee Group will offer a seminar here Oct. 24-25 on "IBM' The Next Five Years in Automated Systems Integration:" The seminar will examine IBM products and IBM marketing strategy, a spokesman said..

"IBM's virtual monopoly in the DP and office automation marketplaces has left it with a large, diverse user base — a base that will be offered a wide variety of options during the next five years," he said.

"Products with innovative architectures and universal interfaces will have to be developed if IBM is to sustain its hegemony, notwithstanding incursions from AT&T, Exxon Enterprises, the mini makers and the plug-compatible people," he added.

"It is now apparent that [IBM] is moving into the 1980s with an entirely new generation of computers, peripherals, communications systems and office equipment . . . This evolution, which will surpass the 360-to-370 migration of a decade ago, is the focus of [this] seminar," which will be held in the Harvard Club at 27 W. 44th St.

The cost of participation is $550 for the first registrant of a team and $450 per person for additional team members, The Yankee Group said from P.O. Box 43, Harvard Sq., Cambridge, Mass. 02138.

TP Monitor Gives Added Access

(Continued from Page 39)

ate the communications problem. They also wanted to upgrade the computer itself so it could operate in an on-line mode.

But "I couldn't find anything off-hand," Weatherly recalled. "With our 360 equipment and the size ranges that we had, we found that it wasn't possible with existing software."

Finally, after what Weatherly called "a less than exhaustive search," company officials discovered that a local firm, GBA International, was working on a TP package that seemed to suit the chemical engineering company's particular needs. The user decided to implement the system, consisting of a GBASwift, the TP monitor, the GBA's on-line programming package.

An additional IBM mainframe, a 256K-byte 360/40 running under DOS, was brought in both to ease the increased programming workload and to support the proposed on-line system. The Model 40 interfaced with the original and primary system, the 360/30, through a Model 2314 disk drive.

Although both machines shared the 8M bytes of storage on the disk, they ran relatively independent of one another, Weatherly pointed out.

The current on-line system handles up to 70 engineering runs each day and brings the computer closer to those people who use it the most. "The engineers now have a 'hands-on' capability with the computer and they can move ahead with their work without being dependent on the DP staff," Weatherly said.

D.M. Weatherly is basically satisfied with the monitor and its operation, but will eventually add a switching unit to the two systems and expand the primary system's core memory. "That way, if hardware problems occur, the system could switch from one machine to another," Weatherly explained.

The TP system required little from Weatherly's engineering staff in the way of training and orientation. "Once you've been introduced to the system, it's pretty much self-explanatory," Weatherly stated. "I really had only one programmer working and he was doing the on-line stuff."

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TUESDAY, NOVEMBER 7

9:30 A.M. — Noon

1 **HOW TO COMPUTERIZE A SMALL BUSINESS**
Organizer/Chairman: Joe Glover — Electronic Data Systems
This session will address the major steps in computerizing small businesses. The major components of a small business computer acquisition (hardware, software, training, and maintenance) will be discussed. Examples of small business systems installations will be analyzed.

2. **MICROPROCESSORS IN DATA COMMUNICATIONS**
Organizer/Chairman: Sherban Popovici — Timeplex, Inc.
This seminar examines the demands placed on data communications products by the explosive growth in computer communications, and focuses on the enhanced capabilities of these products made possible by the advent of microprocessors. The advantages, and occasional drawbacks, of microprocessors in data communications are illustrated through specific examples drawn from current applications and projected future requirements. This seminar will conclude with a panel discussion by representatives from the leading companies in the field.

3. **SEMICONDUCTOR IMPACT ON COMPUTER SYSTEMS**
Organizer/Chairman: J. Egil Juliussen — Texas Instruments, Inc.
An overview of current and future semiconductor trends is presented — including microprocessors, RAMs, ROMs, CCDs and bubble memories. The impact of semiconductor technology on processors, mass storage, terminals, peripherals, and systems architecture is previewed from historical perspective and future evolution

4. **PERIPHERALS IN OEM SYSTEMS — LOOKING AHEAD**
Organizer/Chairman: Randy Knapp — Wespercorp, Western Peripherals Division
Market overview and predictions as to what the future might hold, followed by the economic climate, and how it might reflect on future independent business efforts in the area of mini- and micro-computer peripherals. What the future, over the next five years, will hold for hardware, with the session dealing finally with the problems of integrating hard peripherals to the software system and how this may affect the industry in future years.

5 **NETWORKED MICROCOMPUTERS IN PROCESS CONTROL**
Organizer/Chairman: Gary D. Johnson — Process Computer Systems, Inc.
Networking of microcomputers has become a de facto standard method of solving process control problems. When analyzed closely, however, there are a myriad of methods by which microcomputers can be networked. The multiplicity of methods by which micro-computers can be implemented makes it difficult to select the correct technique for the application in question. This session gives exposure to actual working applications and experiences related to the implementation and an overview of network architecture today and in the future.

1:30 P.M. — 4:00

6. **CONSIDERATIONS OF MINICOMPUTER LEASING**
Organizer/Chairman: Neil Kleinman — International Data Corporation

7 **DISTRIBUTED COMPUTING**
Organizer/Chairman: Neil D. Kelley — Infosystems
Communications is a key factor in distributed computing. Interlinking of different protocols and architectures plays a major role in many systems. Distributed processing has a broader scope today; for example, some systems handling both word and data processing. Multi-function, multi-supplier systems require an understanding of communications.

8. **FUTURE HARDWARE TECHNOLOGY IN SMALL COMPUTERS**
Organizer/Chairman: Edward J. Bride — Desktop Computer, Div., Hewlett-Packard Co.
Much has been said about new applications of small systems, yet few people have been willing to address the hardware developments that will enable users to implement some of these applications. In this session, manufacturers and consultants look to the future and project some of the innovations which will be embodied in minicomputers, microcomputers, and desktop computers within five to eight years. Included in the last category are computers also known as "portable" computers; speakers will address "personal" computers as the term is used to describe single-user systems in business/administrative applications. "Hobby" computers will be considered under minis or micros.

9. **THE NEW IBM-COMPATIBLE MINIS — MARKETS AND APPLICATIONS**
Organizer/Chairman: William W. Orrange — Simon/Public Relations
Three industry leaders will discuss the newly introduced IBM 270-compatible minicomputers, their architecture, and where and how they will be used. Dr. Anderson and Mr. Siehl represent two of the firms that have announced these new generation minis, and Mr. McGuire represents a firm that has announced a complete business system based on the new minis.

10. **AUTOMATED MATERIALS HANDLING SYSTEMS: A REALITY WITH THE MICRO**
Organizer/Chairman: Frank C. Goodfinger — Computer Identics Corporation
An applications-oriented presentation of systems utilizing micro-processors for data acquisition and control in the materials handling environment. Individual presentations will address the impact the micro-processor has had on conveyor and automated storage and retrieval systems as well as product labeling and identification equipment. The primary focus will be on the cost effectiveness and operating benefits offered by strategic deployment of micro-based controls in manufacturing, warehousing, and distribution.

WEDNESDAY, NOVEMBER 8

11 **FROM SERVICE BUREAU TO IN-HOUSE DP — AND VICE VERSA**
Organizer/Chairman: Mel Mandell — Editor, Computer Decisions Magazine
Converting from reliance on a service bureau to in-house DP — and vice versa — can be a trauma. Two executives who have experienced this trauma will tell, with no holds barred, how they coped. In addition, an executive of a service bureau will offer inside advice on how to handle these transitions.

12 **APPROACHES TO COMPUTER NETWORK TROUBLESHOOTING**
Organizer/Chairman: Donald K. Wilkin — Hewlett-Packard Company
Since computer network down time is costly, maintenance organizations need to carefully develop their approach to network troubleshooting. A mistake in choosing the proper diagnostic instrumentation could be competitively unwise, if not financially disastrous. There are many different instrumentation philosophies for Computer Communication networks. With the proliferation of protocol analyzers now in the marketplace, there is a need for clarifying their basic differences. This session offers a forum for the major vendors to present their views and, hopefully, an opportunity for discussion.

13 **HOW TO CUT SOFTWARE DEVELOPMENT COSTS**
Organizer/Chairman: Dave Bursky — Electronic Design
In the last five years, software costs have risen from 40% to about 80% of small-system development cost, as hardware prices kept dropping. No wonder many companies offer software development aids, but they often approach the common goal from different even opposite, directions. Panel members — both vendors and users — will represent the alternatives: dedicated vs. cross systems — assembly vs. higher-level language — single vs. multiple users. After a brief presentation of each member's preferred approach, panel members will exchange views and answer questions from the audience. Find out which approach to software development is best for you.

14 **THE NEW GENERATION OF FIXED DISCS**
Organizer/Chairman: L.S. Bleininger — Microdata Corporation
The first generation of fixed discs were introduced by the OEM suppliers shortly after the availability of Winchester Technology. These drives met a narrow range of applications, however, the second generation of fixed disc drives offer a wide variety of technologies, capacities, performance, and prices. This session is to review the alternatives available.

15 **MICRO and MINICOMPUTER APPLICATIONS TO THE OILFIELD**
Organizer/Chairman: Kenny Bergen — N L Baroid
Technological and cost breakthroughs of mini and microcomputers have resulted in their being applied to all phases of the search for oil and gas. However, not all of those applications have been easy or successful. This session will present specific small computer applications in Exploration, Drilling and Well Logging. Basic user requirements will be outlined and the unique problems of adapting fast paced computer technology to the conservative oil patch will be discussed.

16 **KEYS TO SUCCESS IN SELECTING AND INSTALLING A MINICOMPUTER**
Organizer/Chairman: John P. Gallagher — A.O. Smith Corporation, DSO
Business and industry have been attracted to the Minicomputer because of its lower price and technology. However, the impact of the computer is still felt throughout the organization. Business functions have to be mechanized, data needs to be disciplined, cost application benefit priorities should be identified, and proper implementation of activities must be accomplished. Considerations must be given as to where the minicomputer should fit into the organization and who should control this new tool. The experience of the main frame firms can be of some help. Technology and the mini/micro computers make some business applications now feasible to mechanize. New sources of control and profitability are now possible! Let's explore those KEYS TO SUCCESS. Our session will share experiences and "lessons" to be learned with attendees. The result will be rewarding for those people who will be using a minicomputer in a business environment.

17. **BUSINESS ASPECTS OF MINICOMPUTER DISTRIBUTORSHIPS**
Organizer/Chairman: William McNamara — Randal Data Systems, Inc.
The small business computer market is ready, but are you ready for it? It is not enough to meet the financial requirements; to have the right technical expertise available, and to be able to produce sales volume. You must ask yourself a number of other very important questions. For instance, (1) How do I get started? (2) What Manufacturer elements should I look for? (3) Do I have the stamina and drive to make a venture successful? (4) What do I really want to do? The answers to these questions and many more will determine your success.

18 **PASCAL ON MICROS AND MINIS**
Organizer/Chairman: Winsor Brown — General Automation, Inc.
Pascal, a relatively new language on the mini and micro scene, is the most widely acclaimed programming language in software engineering circles. The benefits and features of Pascal will be highlighted. Several implementations of Pascal on micros and minis will be discussed, including the one from UCSD Institute for Information Systems. General information about the state-of-the-art of Pascal on small computers will be provided along with information of workshops for systems programming extensions to Pascal.

19. **EXTENDED DISK MEMORY FOR MICROS AND MINIS**
Organizer/Chairman: Keht Winton — System Industries
This session will deal with the use of OEM peripherals — in particular, disk memories — in minicomputer and microcomputer systems. It will help attendees learn how to save money ordering such equipment, as well as how to use it and what pitfalls to avoid. Individual papers will focus on unique, real-life applications, especially in high performance systems seen to be extending the boundaries of minicomputer capabilities.

20. **IMBEDDED MICROPROCESSORS IN MILITARY AND INDUSTRIAL SYSTEMS**
Organizer/Chairman: Leo A. Chamberlin — Texas Instruments
The mini/microcomputers being developed by private industry offer the opportunity to increase capability and lower cost of weapon systems. There are many problems, however, to incorporating commercial products in military systems, including licensing of software and hardware, assurance of long term availability. These problems will be addressed by a panel of military and industrial personnel.

THURSDAY, NOVEMBER 9

21 **HUMAN ENGINEERING ASPECTS OF DATA ENTRY — THE PROBLEMS AND SOLUTIONS**
Organizer/Chairman: Dr. Malcolm G. Lane — Software Systems, Incorporated
It is well known that without correct data, the value of a computer system greatly diminishes. Since the majority of errors in data result from incorrect entry, data entry is an extremely important part of all computer installations. This session concentrates on the human engineering aspects of designing data entry systems and includes discussions of the problems and solutions of designing such systems. A discussion of data validation/verification techniques is also included.

22 **BUSINESS, ENTREPRENEURIAL, AND INVESTMENT OPPORTUNITIES IN MINIS AND MICROS**
Organizer/Chairman: Stanley Klein — Mini-Micro Systems
To examine the financial significance arising from the mushrooming opportunities in applying minis and micros to business, industrial, and home applications. Speakers will address emerging hardware and software opportunities for systems and software houses, entrepreneurs, individuals, and small established companies, as well as the investment opportunities for those wanting to support such activities financially. Most important, the session will cover the pitfalls and problems to be encountered and also discuss examples of successful enterprises. Session Chairman Stanley Klein is especially interested in this aspect of the mini-micro world both as editor-in-chief of MINI-MICRO SYSTEMS magazine and as previously a department editor at BUSINESS WEEK magazine, responsible for "Busyweek's" coverage on new product innovation. Mr. Klein also writes on computer topics for the Sunday New York TIMES business section.

23 **APPLICATIONS PROGRAMMING LANGUAGES**
Organizer/Chairman: Winsor Brown — General Automation, Inc.
The major applications programming languages such as FORTRAN, COBOL, Pascal, BASIC, and PL/1 will be presented. The features of the languages presented that make them oriented towards given application areas will be identified by each presenter. Particular emphasis of each presentation will be the methods used to get the usually large, high-level languages into and onto smaller and smaller computers. Only recently, have mini and/or micro computer implementations of COBOL, PL/1, and Pascal been demonstrated. While the presenters will probably be implementers, it is hoped that feedback during the discussion period will provide insight into user experiences with these high-level languages on minis and micros.

24 **MINICOMPUTER TAPE SUBSYSTEMS**
Organizer/Chairman: Clark Hollingsworth — Datum

25 **GROWING IMPACT OF THE MICROPROCESSOR ON COMPUTER GRAPHICS**
Organizer/Chairman: Carl Machover — Machover Associates Corp.
Microprocessor-based or influenced computer graphics devices are beginning to dominate the graphics market. Microprocessors provide significant stand-alone capability in addition to simply replacing hardwired controllers. A $30,000 interactive drafting system, several stand-alone graphic desktop computers, a high-performance vector-refresh display system, a laser high-speed automatic digitizer, and a plotter and digitizer each costing about $1,000, will be described in this session.

26. **WORD PROCESSING — AN INTELLIGENT APPROACH WITH A DP FUTURE**
Organizer/Chairman: John Hansen — Infosystems
A fresh look at mini/microcomputers in word processing systems and how they're changing life in the office. A panel of users and vendors will discuss the convergence of word processing with data processing, highlighting such topics as: the systems involved, the people who run them, the resulting economies and fulfilling management's needs. Among other management concerns, the role intelligent word processors are expected to play in the overall corporate information structure will also be explored.

27. **HOW TO GET STARTED AS A SMALL SYSTEMS ENTREPRENEUR**
Organizer/Chairman: Phillip J. Sabol, Corporate Planning and Finance
A "HOW TO" approach that zeros in on the critical aspects of the small entrepreneur's search for funds (debt or equity). The Business Plan . . . How to Prepare It; The Presentation . . . Maximizing Your Potential; The Lender . . . How He Evaluates Your Request; Sizing up the Market; What's Happening in the Market; Small Business Opportunities; Competition and Survival; How to Sell to the Marketplace; Pre-requisites and a Game Plan.

28. **THE FUTURE OF APPLICATION SOFTWARE FOR MINICOMPUTERS**
Organizer/Chairman: Alistair MacDonald — Hewlett-Packard, DCD Division

29. **PRINTERS**
Organizer/Chairman: Julian St. John — Dataproducts

30. **ADD-ON MEMORIES**
Organizer/Chairman: William Knack — Electronic Memories and Magnetics

NOTE: **Each session will consist of 3 – 4 Speakers**

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Adds 'Visibility' to Operations

System Helps Drive to Engine Works

WATERLOO, Iowa — The problems of running an assembly line which produces large diesel engines are manifold, but they increase even more when the assembly plant covers nearly one million square feet, is more than a third of a mile long and houses hundreds of workstations.

To ease the problem, the John Deere Engine Works of Deere & Co. here installed an IBM 370/168 to process the data as smoothly as the firm produces the engines. CRTs connected to the system are located throughout the plant for use by management and supervisory personnel. The 6M-byte system runs undet MVS and uses JES-3 and Information Management System (IMS).

"The payoff from this approach has been impressive," according to Francis Pardoe, manager of the Waterloo engine plant. "The swift and versatile computer communications system provides needed visibility of plantwide activities — what's happening, where, when, why.

"The system supports better management decisions at all levels," Pardoe said, "and promotes smoother operations from raw material receipt to finished product shipment. The net result is higher productivity at lower production cost."

The 168 — one of two in use here — is connected to an IBM System/7 located on plant premises. That system, in turn, is connected to more than 100 IBM 2790 data collection units throughout the plant work areas.

As work moves through the plant, the data collection units report progress and performance. The small plant computer accepts the entries, edits them, stores them and passes them along to the 168 control computer, which updates affected master file records to reflect current status.

The updated file information becomes immediately available on the CRTs, completing the continuous control cycle.

Everyday Involvement

Involvement of the computer communications system in everyday plant operations is remarkably broad and deep, Pardoe said. "It is the key to production scheduling, engine lineup and assembly line balancing.

"It tracks materials, parts and engines through all manufacturing steps; records labor and product costs; pinpoints inventory and storage locations, and reports work performed and workload queues by workstation. All along the line, it keeps management informed of where we stand and how we're doing," he explained.

Information closely parallels work. On the production end, for example, computer involvement begins with the basic engine lineup. This is the schedule that outlines what orders, engine models and sizes are to be produced and in what sequence.

The schedule extends over a 15-day period, but the specific engine lineup is set daily via a "conversation" between the production scheduler, who uses a CRT terminal, and the computer.

The scheduler at the terminal can call up a display of all lined-up orders for a particular engine model or for all lined-up engines for a particular date. A particular engine or a group of engines from one particular "build sequence" on a specified day and assembly line can then be moved to another build sequence on another day or to a different build sequence on the same day.

Lineup additions and changes can be entered, line spacings can be altered, holds can be placed on a single engine order or group of orders and another order or series of orders can then move into the vacated schedule slots.

With the engine lineup established, the system moves into a line-fill program, using the bills of material for the lined-up engines to determine parts requirements for the assembly line. Here the computer employs a storage control data base to determine inventory availability and locations and to issue pick lists for movement of the needed parts and materials to the assembly line.

The objective is to expedite delivery of the correct engine parts to avoid line slowdowns or stoppage and to prevent inventory over-

(Continued on Page 48)

Large-Scale System Helps Keep Hi-Fi Maker Abreast of Orders

By Tim Scannell
CW Staff

MOONACHIE, N.J. — Sophisticated inventory controls, multimillion-dollar marketing programs and advanced computer technology are all virtually worthless if a firm's customers aren't eventually satisfied. This is particularly true in the "highly volatile" and competitive hi-fi component business, according to Barry Shereck, vice-president of finance for the U.S. Pioneer Electronics Corp.

Pioneer manufactures everything from portable radios to complex stereo receivers and sells its wares from more than 5,000 independent retail outlets scattered across the country. The firm recently installed an IBM 370/138 on-line computer system to keep up with customer demands and to try to remain one step ahead of an army of competition.

"When a customer decides to buy a stereo system, he won't wait for a store to get delivery on a particular system," Shereck explained. "He wants to play his music today. This means we always must have a full inventory available for our dealers."

The computer, located here at Pioneer's headquarters, controls inventory by monitoring each dealer's distribution and purchase patterns. The system also relieves a certain amount of credit-related "back-order chaos," Shereck said. "Because our industry is credit bound, most dealers are operating at their credit limit . . . and the system enables us to have a central data bank to make credit and product decisions very quickly."

Dealers order equipment through either an independent sales representative or directly from one of Pioneer's four sales offices. The sales offices, located in Los Angeles, Dallas, Chicago and New Jersey, double as warehousing operations, and operators there enter inventory and order information into the central computer via IBM 3770 data communications stations.

"The computer then tells [the operator] what merchandise is shippable, what is back-ordered and whether the equipment is credit-released," Shereck continued.

If the equipment is not credit-released or paid for in advance, the order is transferred to a credit hold file, and the information is passed to the firm's New Jersey credit office. "That office reviews the customer's file and . . . tells the dealer the order will be released pending the receipt of a check," Shereck

(Continued on Page 46)

Top Quarterback in the EDP

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We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Oh yes. one more thing.
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System Keeps Hi-Fi Maker Abreast of Orders

(Continued from Page 45)

said.

Pioneer also uses the system and its day-to-day method of recording transactions to plan marketing strategies and sales programs. "Previously, we wouldn't know how well we did in a month until probably 10 days after the month closed," Shereck noted.

"Now, we know what's happening because all the transactions are always in the computer," he explained. "We know where we are and what kind of paperwork and product flow we're facing."

Mini to On-Line

The electronics firm originally used a minicomputer system — on a limited basis — for sales reporting, accounts receivable and cooperative advertising, Shereck stated. It then upgraded to a non-IBM mainframe which was subsequently scrapped because of poor equipment response times and negative support from an outside supplier. Finally, the firm contacted IBM and the present system was constructed.

"No one really knew what kind of computer we were going to need or what our needs were going to be," Shereck pointed out. "We were really starting from scratch."

Initially, IBM recommended a 370/125 Model 2 but, after reviewing the company's needs and goals, reversed its opinion and installed the current 138. The system has 1M byte of memory, uses a disk operating/-virtual memory storage system, and runs under Systems Network Architecture (SNA) with Synchronous Data Link Control (SDLC) under the Virtual Telecommunications Access Method (Vtam). Remote job entry (RJE) and system program maintenance (SPM) capabilities are also included in the system's architecture.

Employee Reaction

Aside from the obvious technical problems associated with building a system from scratch, the computer's introduction met with a certain amount of psychological resistance from the employees.

"Our people who lived through the first computer's failure with us were initially very disappointed." A lot of rumblings were going on, and people were concerned about losing their jobs, Shereck observed.

"There was some trepidation when the computer went live that we were going to run it for six months and then start lopping off heads," Shereck noted. However, "we're a very close-knit company in many, many ways and we told them right from the beginning they were not going to lose their jobs because of the computer. They knew we weren't conning them and given the trust that exists in this company, they believed us," Shereck said.

The computer not only caused Pioneer, a medium-sized company, to operate like a much larger firm, Shereck explained, but also incited a "real management revolution." "Nobody could really 'snow' anybody else because we all had the same information. Nobody was going to hold back orders until the end of the month, show a big peak, and pretend to be a hero," Shereck stated.

The secret of Pioneer's successful transition from a manual inventory system to a computerized one was the complete involvement of everyone from "the most senior levels down to the bottom" and "no surprises," Shereck commented. "Everyone knew what to expect, what was coming and understood what was happening before we installed the first terminal."

Powertec Adds Switching Units

CHATSWORTH, Calif. — Powertec, Inc. has introduced 10 models of single-output 250W and 400W switching power supplies, extending the company's Superswitcher series.

The units introduced include outputs of 2V, 5V, 12V, 15V and 24V; each is available in 250W and 400W units.

Every unit has undergone a 24-hour, elevated burn-in testing procedure on all electrical parameters for product reliability, according to the company.

The units feature soft-start circuitry, a logic inhibit function and overload and overtemperature protection, Powertec said, adding that the series features a motherboard design that eliminates internal wire harnessing, providing increased reliability.

Packaged with a built-in cooling fan, the supplies feature remote programming and a maximum 30 msec energy storage in the event of brief power failures, the company noted. This permits orderly system shutdown, a spokesman added.

Prices for the 250 unit start at $450 and the 400W units start at $550, Powertec said from 20550 Nordhoff St., Chatsworth, Calif. 91311.

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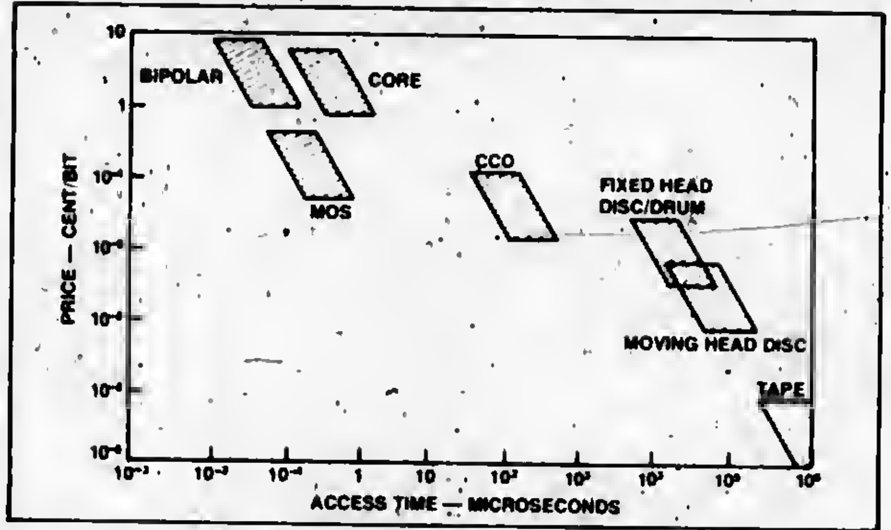
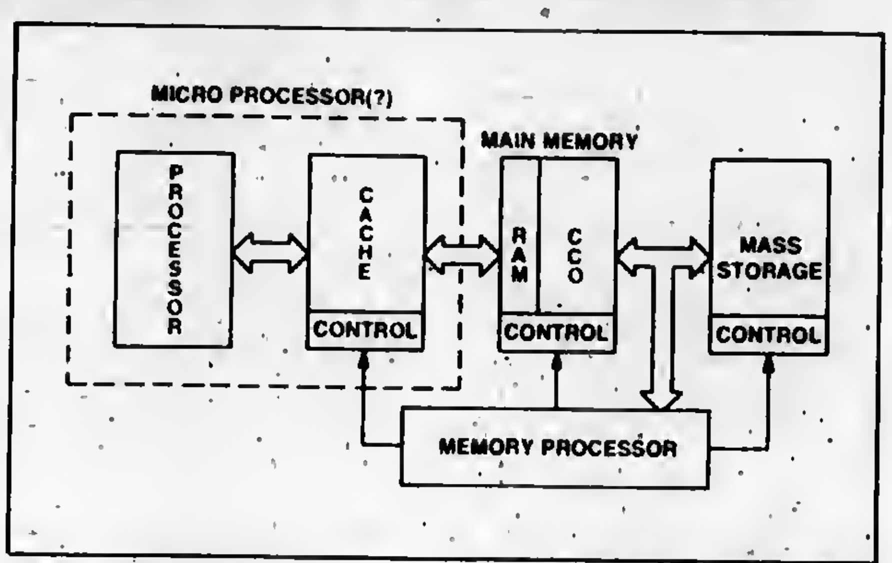
TRANSFER RATE	2 MEGABITS/SEC.	1-5 MEGABITS/SEC.
TYPICAL STORAGE CAPACITY	16K-BITS/CHIP	64K-BITS/CHIP
READ ERROR RATE	$10^{-11} - 10^{-12}$	$10^{-11} - 10^{-12}$
MTBF (HOURS)	7000	7000
NON-VOLATILE	NO	NO
COST/PER BIT	70 MILLICENTS	35 MILLICENTS

CCD vs. MOS RAM Performance Characteristics

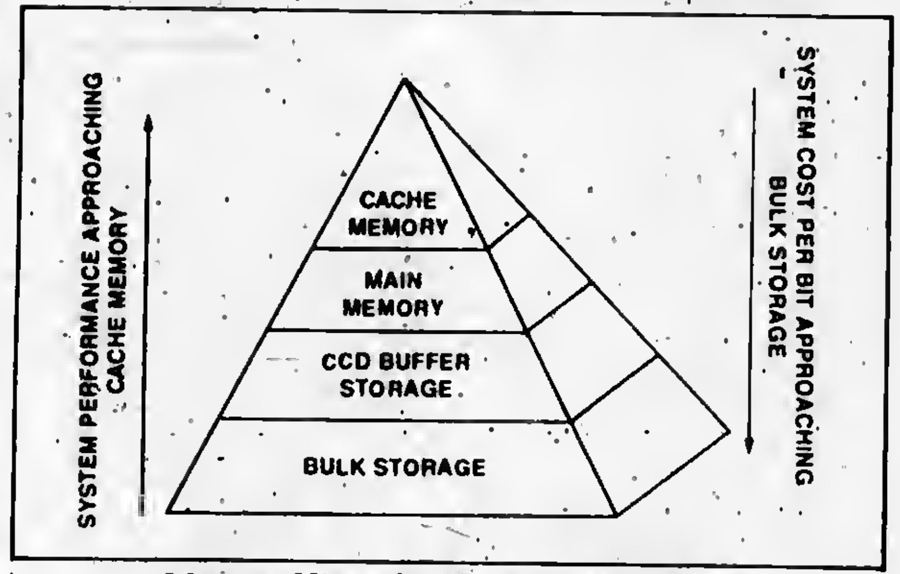


Price/Performance Characteristics



Charts Courtesy of Ian Le Mair of Motorola, Inc.

Structure of Future Systems With CCD/RAM


SYSTEM PERFORMANCE APPROACHING CACHE MEMORY
CACHE MEMORY
MAIN MEMORY
CCD BUFFER STORAGE
BULK STORAGE
SYSTEM COST PER BIT APPROACHING BULK STORAGE

Memory Hierarchy of Computer Systems

Special to CW

LOS ANGELES — Within 10 years systems engineers will be less dependent on the use of dynamic random-access memory (RAM), thanks to the use of a single chip that combines both RAM and charge-coupled device (CCD) memory, according to Doug Powell and Ian Le Mair of Motorola, Inc.

This increased use of CCDs will bring lower systems costs without impacting performance, but will require changes in the structure of software to capitalize on intelligence in a hierarchical memory system, they told a session on the impact of new memory technologies at the recent Western Electronic Show and Convention (Wescon) here.

CCDs are taking their place in the hierarchy of memories between bulk storage and main memory (RAM). Eventually this hierarchy will change, reflecting the absorption of what is typically now considered main memory into the CCD arena, they said.

"This will happen as the interaction between the CCD memory and the RAM main memory are combined on a single RAM/CCD chip," they explained.

The chip could also "contain the control logic necessary to make this combination appear as a large RAM-only chip. The internal RAM would act as a buffer or 'cache' for the CCD."

Such a hybrid's performance would offer an average access time of about 100- to 300 nsec, which is compatible with today's main memory speeds. The chip could contain 1M bit or more and have the low power dissipation of CCDs, they continued.

Basically, Powell and Le Mair envision a system that has three types of memory, each with its own control. All memories would share a memory processor.

The CPU, which could be a micro, would have a cache; the main memory would be the RAM/CCD hybrid; the third type of memory would be mass storage.

Fast Buffers

In the current hierarchy of memories, CCDs can be used as fast buffers between moving-head and floppy disks in applications such as intelligent terminals.

Powell and Le Mair estimated that in the small business computer category of processor — those priced at $2,000 — where cost is a key consideration, the ratio of CCD to RAM devices may be about 4:1.

Higher-Bit Density

CCDs are about eight years old, having been born at Bell Laboratories.

Reliability equals that of RAMs; improvements made in RAM processing, manufacturing and design can usually be directly applied to CCDs.

But CCDs can achieve higher bit density and lower cost per bit than RAM. They have higher yields because of the absence of metal lines or contacts in the array, Powell and Le Mair explained. The lack of "active" elements contributes to higher densities.

The density of CCDs is currently, and probably will continue to be, about four times greater than that of RAMs. Almost here are 64K-bit RAMs and 256K-bit CCDs are expected next year. In four years there should be 256K-bit RAMs and 1M-bit RAMs and 1M-bit CCDs.

CCDs fit squarely in the price/performance gap between main memories — bipolar, MOS and core — and bulk storage devices such as tape and disk. Current CCD chips have a cost of about 30 millicent/bit, they said.

But the problem with substituting CCD for bulk storage is that CCDs are volatile, they noted.

For RAM replacement applications, CCDs are cost-effective for applications that don't require high-speed memories, but are more sensitive to cost and packing density, they remarked.

Ebam Predicted Next Wave Of Memory Technology

Special to CW

LOS ANGELES — It was not too many years ago that attendees at the Western Electronic Show and Convention (Wescon) heard charge-coupled devices (CCD) and bubbles described as the next wave of memory technology. Those devices are now a fait accompli, and the challenge to fully utilize their capabilities has passed from the laboratory to the systems designer.

But what about the future? Commercial electron beam accessed memory (Ebam) systems can be expected in the early 1980s, Donald O. Smith of Control Data Corp. said here recently at the latest Wescon.

Young later substantiated his claim by remarking that several large companies have spent $150 million to develop bubble technology. Not one-twentieth of that has been spent on Ebam, he said, adding an infusion of dollars would most certainly push not only Ebam out of the laboratory, but the next generation of memory as well.

In optics, two stages of deflection are used to access 100 to 1,000 times more resolvable spots than was possible with one stage.

Zero Access Time

Ebam can be very fast and may be considered from a system polnt of view as a nearly zero access time, high data rate disk, Smith commented. As such, it could find use as a disk replacement, as a cache for a disk, a staging memory and as a direct access memory, he indicated.

Currently it is possible to make an Ebam with tubes having 1G bits with an 80 microsec access time.

Looking to the future, Smith suggested it may be possible to package 4G bits in a tube 1 in. in diameter and 2 in. long.

The per-bit storage cost should be less than for disk and because Ebams are nonvolatile, they could replace disks, he said.

However, there are problems that require special data management. For example, the target "fatigues" and has a limited lifetime when irradiated with an electron beam. Also, there is no threshold at which charge is stored or removed from the target, Smith said.

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Engine Works Gets DP Horsepower Boost

(Continued from Page 45)

loading at the assembly line stations.

Every engine in the lineup is tracked via the on-line data collection system as it moves through the assembly stages, from the time the machined engine block is hung on the assembly line until the finished engine is deposited in the warehouse for shipment. Current engine information is instantly available by terminal inquiry which can be made by engine, department or model number.

In addition, the tracking program provides inquiry capability on missing engine parts by serial or part number.

"The control benefits on the engine lineup, line fill and engine-tracking routines are obvious," Pardoe declared. "We know which engines are to be built, when and in what sequence. We know if the required parts are available and where they are located.

"We can determine the status of any or all engines in production, at any stage of production — on the assembly line, built, tested, trimmed and painted. And we can put our finger on actual and potential problem areas, such as missing parts, test failures, or line bottlenecks," he noted.

Materials Control

Control advantages are also impressive on the materials side. Here computer involvement starts with receiving incoming material which is controlled from the time it arrives on the dock until delivered to work-in-process departments. The terminals provide for on-line receipts reporting and inquiry.

A pervasive materials tracking system keeps tabs on material movement across production operations. The on-line data collection units on the shop floor come into play once again, as they are used to report material receipts into key plant departments.

Data collection terminal entries also feed the shop floor monitoring system to update a running record of parts produced, scrap and "hold" parts by workstation. Inquiries can be made to determine all parts in process in a particular department, the quantity available and the quantity on "hold" for each operation by any part number, the parts produced and workload remaining by workstation.

"The exceptionally tight control over inventories, especially work-in-process inventories, is a major contribution of the on-line computer communications system," controller Carl Krell said.

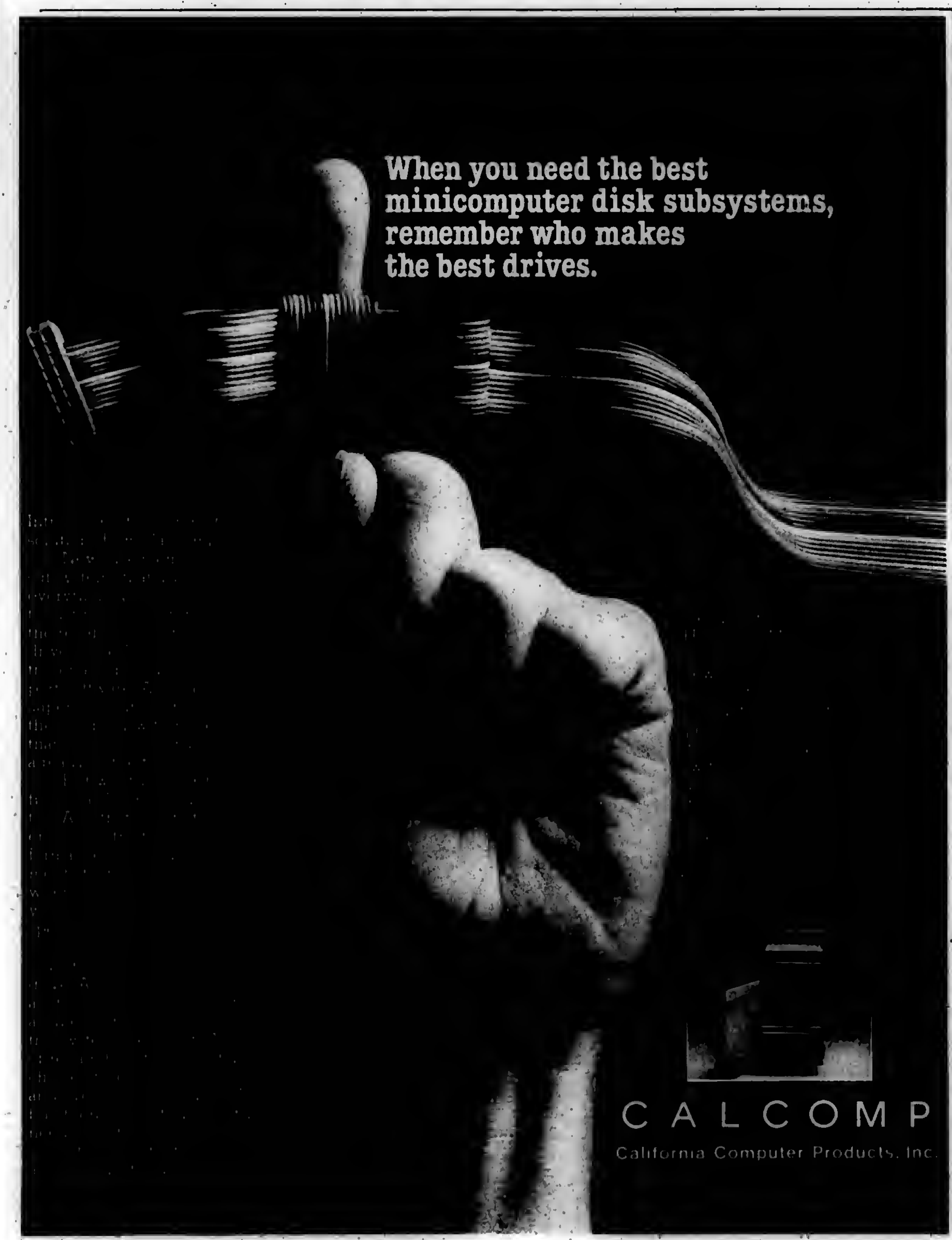
"We are in a better position to evaluate overall materials and parts inventories, and we can act more swiftly to utilize 'hold' material. As is typical for new plants, our inventories of materials and parts have been growing as the plant production rate has increased. However, stocks are leveling out now, even declining in some areas. We're convinced the on-line information system will result in a lower inventory investment," he said.

The same information fed from the plant data collection terminals also makes an important contribution to better control of labor costs and better labor reporting, according to Krell. "Workers use the 2790 terminals to report attendance, job assignments and incentive labor hours for each operation. The system also permits crew reporting and changes of assignments or departments."

It would be difficult to find a department or operating area at the John Deere Engine Works where computer communications does not play a significant role. In manufacturing engineering, for example, the on-line system collects and disseminates information concerning machines, tools, gauges, fixtures, labor operations and their relationships to each other. Manufacturing engineers can inquire via terminals for up-to-date information on the plant wide status for either tooling or operations, including where-used data or current incentive standards by department.

"The John Deere Engine Works was designed to be a special kind of manufacturing facility right from the start," Pardoe said.

"On-line computer communications provide information that keeps pace with the work, preventing counterproductive decisions and eliminating any confusion on the part of management at all levels. Without them, the plantwide visibility that is so essential to effective planning and control is severely impaired," Pardoe concluded.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BTI Replaces 4000 Time-Sharing Series

By Jeffry Beeler
CW Staff

SUNNYVALE, Calif. — Enhanced software and a more than threefold increase in mass storage reportedly constitute the chief user advantages of Basic Timesharing, Inc.'s (BTI) replacement for the firm's Model 4000 time-sharing systems family.

In a basic configuration, the replacement — the Model 5000 — incorporates a 29M-byte nonremovable disk unit, whereas a basic 4000 sytem provides a 7.5M-byte disk unit. Yet despite the expanded mass storage, the 5000 costs only $3,000 more than its predecessor, according to a BTI spokesman.

Among its other enhancements, the 5000 sports a modified version of the 4000's time-sharing executive. One of the main improvements to the revamped executive is a sort function that is callable in Basic-X, BTI's extended Basic, but that runs in machine language.

With this software feature, the 5000 can sort up to 30 times faster than with standard Basic — a capability that reportedly lends the system to inventory control, data base management and other business functions requiring frequent sorting.

In processing power, the 5000 equals the 4000 and falls approximately midway between the Hewlett-Packard Co. Model 2000 and 3000 systems, the source explained. The BTI system will also compete with the Digital Equipment Corp. PDP-11/70, although it will provide less processing power than the DEC equipment.

Front-Panel Design

In addition to providing an alternative time-sharing executive and disk capacity, the 5000 differs from the 4000 in CPU front-panel design and communications multiplexer features.

Although both the 5000 and 4000 are built around an HP 21MX processor, the replacement system offers a set of front-panel switches not available with the earlier product line. With these additional controls, users can perform diagnostics automatically, even during system shutdowns, the spokesman explained. The 4000 family lacked the automatic diagnostics feature, he added.

BTI also redesigned the 500's multiplexer to accommodate

(Continued on Page 50)

Basic Timesharing, Inc.'s Model 5000

Left Hanging by Ailing Vendor, User Gets Help, Finishes System

NEW YORK — The story reads like an end user's nightmare. Garrick-Aug Associates Store Leasing, Inc. contracted with a local hardware distributor to develop and install a $250,000 turnkey minicomputer system to help the user match area retail locations with the store needs of retail chains and privately owned retail outlets.

But before it could complete the installation and develop the necessary software, the vendor suddenly announced it was on the financial "skids" and about to declare bankruptcy.

Faced with the disastrous prospect of losing its large minicomputer investment, Garrick-Aug went in desperation to another local hardware distributor, Turnkey Sales & Leasing, Inc. (TSL) for help.

Happy Ending

Fortunately for the store leasing specialist, the potentially calamitous story ended happily. TSL completed the stalled installation, developed and debugged the software and arranged a favorable lease through one of its divi-

(Continued on Page 52)

Michael Hirschfeld, board chairman of Garrick-Aug Associates, accesses the store-location file stored in the company's Reality mini.

Structured Plan Lets Users Rent Series/1 by Month

NEW YORK — Users can now rent Series/1s under a structured program that its developer suspects is the first plan of its type to cover IBM minicomputers.

"We don't know of anyone else who will provide a complete IBM Series/1 software-hardware installation with no strings attached," according to David Mack, chairman of DDP Products, Inc., the program's developer. Mack credited the plan with making the minicomputer sytsems "as simple to obtain as a rent-a-car."

Under the plan, DDP Products will rent Series/1 hardware, software and maintenance pack-

(Continued on Page 50)

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Single-Board S-100 Bus Processor Boasts Mini-Like Capabilities

PRINCETON, N.J.— Minicomputer capabilities and microcomputer packaging are combined in a single-board S-100 bus processor built around a Z80A microprocessor, according to a spokesman for Xitan, Inc., the product's manufacturer.

Capable of switch-selectable 2- or 4 MHz operation, the ZPU-2 is said to be compatible with Xitan's K series memory modules, which the company introduced at the same time as the processor.

Minicomputer-like features available with the 8-bit processor board include the ability to map up to 1M byte of random-access memory and to support up to four concurrent tasks, the spokesman said.

The processor also comes with two integral options — a system support feature and a floating-point feature — that reportedly facilitate system expansion.

In addition to its memory mapping and multitasking registers, the system support option provides four direct memory access channels that permit I/O units to transfer 2M byte/sec, the source said. With functions like masking and prioritizing, the system's software provides interrupt control for eight input lines.

Math Functions Speeded

The floating point option, meanwhile, is said to speed mathematical functions up to tenfold. With this option, the ZPU-2 can perform mathematical functions while other tasks are in progress, the source explained.

Turning his attention to the K series memory modules, the Xitan spokesman credited the products with using standard 16-pin memory chips that accommodate up to 128K bytes on one S-100-sized board. The modules come in 32K-, 48K-, 64K and 128K-byte versions and use a digital delay line to control timing, he added.

A basic ZPU-2 costs $395. As separate items, the system support option and floating point option cost $279 and $499, respectively; together, the features sell for $699, excluding the board's cost.

A 32K-byte K series memory module costs $799; a 48K-byte version, $1,099; a 64K-byte version, $1,299; and a 128K-byte module, $2,599.

Both the K series and the ZPU-2 are available from Xitan at 1101-H State Road, Princeton, N.J. 08540.

Software, Storage Enhancements Included in BTI 4000 Replacement

(Continued from Page 49)

transmissions up to 9,600 bit/sec, four times faster than the previous system's communications.

Why did BTI choose to replace the 4000 with an alternative system? The corporate spokesman views the decision as an attempt to simplify maintenance of the company's time-sharing product line.

Unlike the 4000 family, which provided separate power supplies in each systems module, the 5000 incorporates only one power supply, which fits at the bottom of the system's cabinet. This redesign confines all the replacement system's generating equipment in one place and therefore improves ventilation of control and logic circuitry, CPU, disk controller and multiplexer, the source said.

As a result, the 5000 can operate in ambient temperatures as high as 90- to 95 degrees Farenheit, he added.

As with the 4000 product line, BTI designed its latest time-sharing system primarily as an "in-house, multi-user time-sharing resource," the spokesman said. Typical 5000 users will include commercial service bureau clients who want to convert to an in-house system and businessmen that plan to replace their batch processing computers with interactive models.

64K-Byte Maximum

In addition to a 29M-byte nonremovable disk unit, a basic 5000 configuration incorporates a CPU with 64K bytes of nonexpandable MOS memory, one 10M-byte cartridge disk unit and eight user ports. Users can expand the system's nonremovable disk capacity in 29M-byte increments to 58M-, 87M- or 16M bytes, BTI said.

Moreover, they can use 49M-byte removable-pack disk units in place of or in addition to the 29M-byte storage modules. The 5000 system can support up to eight removable-pack units for a total capacity of 392M bytes, the spokesman said.

Optional peripherals offered with the system include a tape cartridge module, which accommodates one to four drives, and a choice of four line printer models ranging in speed from 300- to 600 line/min.

A basic 5000 configuration costs $38,950, compared with about $80,000 for a realistic maximum configuration consisting of a 64K-byte processor, 100M bytes of disk storage, 32 user prots, 9-track tape unit and line printer.

Shipments of BTI's latest time-sharing system began last month from the company at 870 W. Maude Ave., Sunnyvale, Calif. 94086.

Structured Program Lets Users Rent Series/1 on Monthly Basis

(Continued from Page 49)

ages by the month with a 30-day cancellation option.

The plan applies, however, only to customers who acquire the Series/1 hardware with DDP Products' software offerings, which include the DDP/1 package, a communications-oriented file management and data entry system for distributed processing applications.

Under terms of the rental agreement, DDP Products will repair all malfunctioning Series/1 equipment at its own expense. Users, however, must pay all shipping and installation charges as well as all sales, use and property taxes resulting from rental or possession of the hardware.

DDP Products offers its Series/1 hardware-software package at both short- and long-term rental rates. At the one-month rate, the company rents its DDP/1 software for $325 per CPU. Rental costs of the associated hardware vary with the configuration.

At the three-month rate, the package rents for the basic price less a 10%/mo discount; at the six-month rate, for the basic price less a 20%/mo discount; at the one-year rate, for the basic price less a 40%/mo discount; at the two-year rate, for the basic price less a 50%/mo discount; and at the three-year rate, or the basic price less a 60%/mo discount.

DDP Products can be contacted at 31 E. 28th St., New York, N.Y. 10016.

'First Industrywide Analyses'

Users Group Commissions Benchmark Tests of Minis

BOULDER, Colo. — The Association of Small Computer Users (Ascu) has selected Real Decisions Corp. to provide what association president Hillel Segal claims will be "the first industrywide benchmark analysis of small computer systems."

Ascu, a minicomputer users group formed five months ago, will publish the results of the Stamford, Conn., firm's benchmark tests in the association's bimonthly newsletter as part of a continuing member service.

"We were able to contract for the study far sooner than we had anticipated as a result of the unexpected growth Ascu has seen since its inception," Segal explained.

Specific Benchmarks

The first benchmark analysis will focus on the most popular small systems models as determined by member requests. Those models include the IBM 5110 and assorted machines from Digital Equipment Corp., Wang Laboratories, Inc., Hewlett-Packard Co., Data General Corp. and Datapoint Corp.

In its benchmark tests, Real Decisions — which performs a similar service for Ascu's sister organization, the Association of Time-Sharing Users — will relate the performance of selected systems according to three criteria: speed of repeating computing tasks, time needed to run user programs and ease with which editing software can be used, Segal said.

Likening the analyses to automobile tests, the association president observed, "The first, repetitive tests might be called the 'drag races.' They will be performance tests to determine the actual speeds of short, repeated operations."

The "road race" phase of the evaluation will test computer performance for specific user program.

Subjective Tests

The third and final phase of the benchmark tests will be more subjective than the first two and will rate the "handling ability" of the competing systems' editing commands, Segal added, concluding the road race analogy.

Ascu will publish the results of the first benchmark tests — involving the 5110 — in November.

Ascu can be contacted at 75 Manhattan Drive, Boulder, Colo, 80303.

Cartridge Disk Controller Emulates DEC's RK-11

SANTA CLARA, Calif. — A cartridge disk controller from Xebec Systems, Inc. emulates the Digital Equipment Corp. RK-11 system and allows users to interrace up to four 20M-byte disk units to the DEC PDP-11 and LSI-11, according to a Xebec spokesman.

Capable of plugging into the DEC Q-bus and Unibus, the Quad controller is plug compatible and software transparent with the RK-11 and is media compatible with the RK-05, the source said.

Xebec reportedly offers the single-board controller as a stand-alone unit, as part of a single-drive system or with multiple 5M-, 10M- or 20M-byte disk systems.

Built around the Xebec X2 bipolar microprocessor, the quadwide controller incorporates an 8-word first-in first-out to synchronize processor and disk timing.

With minor changes to the RK-11's software drivers, the unit is said to support disk systems that rotate at up to 2,400 rpm, record as many as 2,200 bit/sec and provide up to 406 cylinder/drive with 4- to 8 track/cylinder.

The Quad costs $2,800 without disk units and $9,100 with one 20M-byte system. Xebec is located at 2985 Kifer Road, Santa Clara, Calif. 95051.

'Automated Office' Built Around 8080A

ARLINGTON, Va. — All the hardware and software needed for an automated office are reportedly available with a microcomputer-based business system from Applied Microsystems Division (AMD) of Operational Systems, Inc.

The Automated Office incorporates AMD's 8080A-based Micromis microcomputer, a 64K-byte random-access memory, integrated dual floppy disk units, a Lear-Siegler, Inc. ADM-3A CRT terminal and a Nippon Electric Co. Spinwriter printer. It also provides two software packages — one a financial management and accounting (Finmac) system, the other a text processing system.

Finmac, a double-entry accounting system, consists of integrated software modules for payroll, accounts receivable, accounts payable, general ledger, cash receipts and disbursement and financial report generation.

The system's text processing software, provides modules for text entry and storage, character and text-block editing, text-block manipulation, global editing functions, document printing, personalized letter production, mailing label printing and list indexing.

Prices of the Automated Office start at $14,300. AMD is at 3140 N. Washington Blvd., Arlington, Va. 22201.

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Programmer Facilitates Prom-to-Prom Transfers

MONTEREY, Calif. — Data can reportedly be transferred from one type of programmable read-only memory (Prom) to another with a Prom programmer from Pro-Log Corp.

Using a 2K x 8 CMOS read/-write buffer memory, the M900B control unit can retain data in storage for as long as one minute after the loss of ac power, according to a Pro-Log spokesman. This retention allows users to remove one Prom personality module and replace it with another.

Pro-Log Corp.'s M990B

It also lets users switch buffer memory for direct Prom-to-Prom copying, the source added.

With the buffered unit's ability to retain data without power, users can load data into the buffer and verify it before programming begins. Because of the M900B's uninterrupted serial bit stream operation, users can also boost their communications speeds with the unit supplying the programming data, the spokesman explained.

In addition to allowing data to be moved from buffer to Prom, the M900B reportedly provides a data location shift capability that permits users to transfer blocks of buffer-stored bits to any location within the Prom being programmed.

The product costs $2,100, available from the firm at 2411 Garden Road, Monterey, Calif. 93940.

Left Up in Air by Ailing Vendor, User Gets Help to Finish System

(Continued from Page 49)

sions.

The result — a turnkey minicomputer system that stores more than 250,000 pieces of instantly accessible information concerning more than 5,000 area store locations.

Some of the roughly 70 parameters contained in the system's retail store data bank include rent, traffic count; ceiling height, store depth, window height, front footage, transportation availability, corner or noncorner loacation and a summary of nearby competitors.

With this compendium of vital demographics, Garrick-Aug claims to have attracted as clients some of the country's most sophisticated retailers and restauranteurs and to have become the country's largest real estate firm dealing in store leasing.

Crucial Elements

"In retailing, location and its price are crucial elements," Garrick-Aug board chairman Michael Hirschfeld said. "We've seen retailers pay too much for a location which inhibits their necessary advertising and promotion budget. As a result, their sales volume and profits suffer."

A nonretail corporation can easily withstand a poor choice of office location because floor space costs represent only a small fraction of its total overhead. "But for a retailer, location can be everything," Hirschfeld explained.

Although many Garrick-Aug employees had retail experience before entering the real estate field and can counsel clients on merchandising and store layout, the company duplicated most of its store listings with Xerox Corp. copiers until a short time ago.

In November 1976, when the cost of using the Xerox equipment approached $2,000/mo, Hirschfeld began toying with the idea of installing an in-house minicomputer system.

After consulting a local minicomputer vendor, Garrick-Aug spent more than seven months outlining its systems requirements.

System Capabilities

Built around a Microdata Corp. Reality mini, the resulting system consists of a 10M-byte disk unit, a tape drive unit, four CRT terminals with keyboards and an impact printer. In addition, the system incorporated two portable computer access units with telephone couplers which executives can use in the field.

A built-in security code prevents unauthorized access to the Reality mainframe, and only two of the company executives have authority to override the code.

Ninety days after its installation, the system became fully operational, and after an additional 90 days, every executive in the Garrick-Aug organization was using the equipment, Hirschfeld reported.

For the first 45 days after accepting the system, Garrick-Aug maintained a parallel backup system that operated manually. But when the company exprienced no problems with its minicomputer installation, it dropped the parallel system.

Gets Results

"Within one month, our photocopying costs dropped to $250/mo." Hirschfeld recalled. "Based on this savings alone, the turnkey system will pay for itself within 10 years."

Complete Store Listings

Moreover, the system can generate complete store listings in eight hours and thus reportedly gives the company a competitive edge. If Garrick-Aug closes one lease per year because of its head start in producing store listings, the resulting commission would pay for the system's lease for that year, Hirschfeld speculated.

The board chairman also credited the computer system with accelerating Garrick-Aug's growth (10% to 12%) per year.

Small System From DeLair Called Similar to System/34

PHOENIX, Ariz. — A small business system from DeLair Data Systems, Inc. reportedly provides capabilities comparable to those of the IBM System/34 for about $650/mo under a five-year lease.

Compatible with the company's Model 1600 systems series, the 1602 primarily serves "smaller" businesses like manufacturers, distributors, retailers and accounting firms, according to a DeLair spokesman.

A basic 1602 configuration incorporates a 16-bit minicomputer with a 64K-byte central memory, 9.6M-byte removable cartrdige disk unit, 160-char./sec printer and CRT terminal with page mode and editing capabilities. As a user's business grows, the system can expand to accommodate an additional data entry terminal and increased disk capacity, the source explained.

A library of accounting software including packages for general ledger, accounts payable, accounts receivable, payroll, invoicing and inventory control reportedly allows the system to perform the financial functions needed by most businesses.

In addition to hardware and software, the $29,000 purchase price for a basic 1602 configuration covers training, conversion assistance, follow-up consultation and hardware maintenance. DeLair is located at 2639 N. 33rd Ave., Phoenix, Ariz. 85021.

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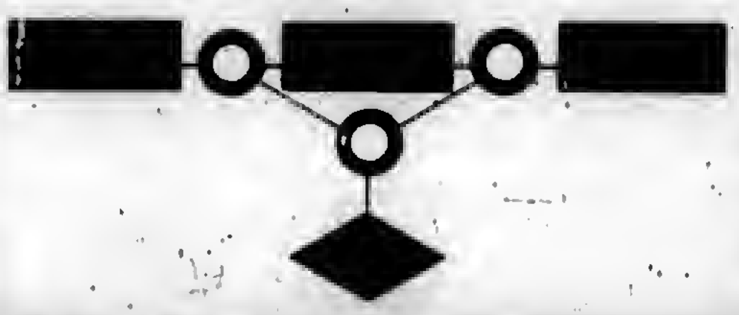

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Also Cuts Classroom Costs

System Teaches Students to Type 50% Faster

SAN DIEGO — Students at a local DP school have learned to type 50% faster than with conventional teaching methods since the institution supplemented its typing instruction with a mini-computer based educational tool.

Capable of concurrently monitoring the activities of up to 64 typing students, the Coleman College system forms part of an automated typing instruction program called Comtutor, which college president Coleman Furr and his wife Lois developed several years ago to supply application packages for computer-aided instruction.

In addition to speeding instruction for beginning typing students, the system has cut classroom costs from $12 per seat per day to about 20 cents per seat per day, Furr said. The system's users include not only novice typists but also programmers and computer operators interested in learning how to use keyboard terminals.

"The system is ideal for school instruction," Furr explained. "It can be turned on in September and turned off in June, and that should accommodate the majority of high schools that teach typing."

Built around a 32K-byte Computer Automation, Inc. Naked Mini, the system incorporates a 5M-word disk unit and a battery of 1,920-char. CRT terminals. Software support includes two proprietary packages that facilitate machine interfacing and student instruction.

Coleman College's software faculty spent more than a year developing the system's interface program, which is based on Computer Automation's Real-Time Executive and which allows the processor and CRT terminals to communicate in real time.

User Capacity

Recalling the main criteria that led to the selection of the school's current configuration, Furr explained, "We needed a system initially that could handle 30 students simultaneously at 30 terminals. If all of them hit the "enter" key at the same time, we wanted the computer to make all the entries immediately."

As it stands now, the system with its software driver can accommodate up to 100 terminals, "but that's probably the outer edge," Furr said.

In operation, the Comtutor system "monitors each student's progress in accuracy and speed during a period covering 30 exercises," according to Bill Wadsworth, administrator of both the school's typing curriculum and its television studio, which produces video tapes to aid instruction in programming, secretarial and stenographic courses.

"The student progresses independently at his own speed. For instance, if he is ill and has to miss a day, the system will resume the lesson when he returns and keys in at precisely the point he left off."

The system registers the student's typing as it occurs and notes the number of errors and the number of words typed per minute. It then displays this information on a CRT terminal to guide the student through the next exercise.

Testing Procedure

Students may not proceed to the next lesson until they have passed a test for the current one.

Testing evaluates each student's speed and accuracy in an attempt to correct individual weaknesses. Because the system grades student performances, it increases the amount of time Coleman College's instructors can devote to individual students.

Another system feature that permits teachers to spend more time teaching is a computer-stored and -updated record of each student's classroom performance. With the system, instructors can access these records on demand.

The computer also proofreads, performs calculations and keeps records of statistics like the number of times each exercise is typed as well as completion times, errors and speed.

When students complete the 30th lesson and pass the associated test, they have achieved a minimum speed of 30 word/min for three minutes with no more than four errors. The test covers all the numbers and letters of the alphabet in a textual format. At this point, students must make the transition from terminals to typewriters.

Coleman College allots three classes for the transition, and Wadsworth claims most students make the changeover easily in preparation for placement in professional positions.

Comtutor's applications are not limited to instruction, however. During nonclass hours, it also performs various administrative functions.

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What to do for a DBMS headache.

A look at data base management systems in our October 30th Special Report.

Getting the right information to the right people at the right time can create tough problems in any large DP system. And the increased bulk of associated information that DP systems handle means a need for more efficiency, capability, and responsiveness.

Data base management systems — the heralded, but controversial solution to increased systems complexity — is the subject of our October 30th *Computerworld* Special Report. Edited by Don Leavitt, *Data Base Management Systems* will be examining many of the uncertainties about DBMS which make it difficult for the planner to determine whether it suits his needs. We'll have stories from users themselves, telling you how they have utilized DBMS, as well as words to the wise on DBMS "overkill". We'll have tips, pointers, and in-depth reviews on evaluating, selecting, applying, and trouble-shooting DBMS, including topics like:

- *The impact of new DBMS on an organization: who "owns' " the data? Who's responsible for its accuracy? Who can use it?*
- *Using DBMS on minicomputers [and even micros].*
- *Relational systems: How they're doing in the real world.*
- *The future of DBMS.*

If you currently use DBMS software, or are planning to buy, this Special Report will be of special interest to you. And if you market DBMS, you'll reach a wide end-user audience here. Ad closing date is October 13th, and your *Computerworld* representative can give you full ad planning assistance. Or, to reserve space for your ad, call Terry Williams at 965-5800.

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AMPEX

Mini, Mainframe Spurned

User Thinks Small, Brews Big Savings

Special to CW

HOUSTON — A microcomputer rather than a mainframe or minicomputer is helping Coors Northeast, a Houston wholesale beer distributor, compile sales reports that have helped the firm boost its sales.

The company, which distributes half a million cases of brew a year to taverns and stores in its territory, once had to wait two weeks for monthly sales reports that compared results on different types of accounts, ethnic areas and demographic sectors, together with comparisons with results of the previous month and of the same month last year.

Salespeople then could spot sales downturns and other developments, but it often was too late to do anything about them.

A year ago, Coors Northeast bought a microcomputer system and developed its own software for route accounting. Now the monthly sales statistics are "whipped out" in four hours, and Coors Northeast can dispatch salespeople "where they're needed," Vincent Polichino, operations manager, said.

"We're able to see results from targeted work in the field, see what's happening out there right away and send in people right away," he added. "This has helped us boost sales by 6%."

In addition, the system handles daily route accounting, reconciling sales and inventory, checking each driver's settlement sheet (what he took out vs. what he returned) and computing cash from sales.

Vincent Polichino, operations manager, takes a turn at Coors Northeast's micro system.

User Selling System

The system has worked so well that Coors Northeast now is offering to sell it to other Coors distributors, with Burcon, Inc., the Houston Mits/Altair distributor, supplying hardware and the beer wholesaler supplying software.

While the system so far has been used as a sales tool, Coors Northeast also has purchased a general ledger software package developed by Altair Software Development Co. (ASDC) and soon will buy a payroll package from ASDC. Adding those two functions is expected to create labor savings.

Coors Northeast's hardware is comprised of a Mits/Altair 8800B CPU with 48K of core memory, three floppy disk drives, a Lear Siegler, Inc. ADM-3 CRT terminal and a Texas Instruments, Inc. Model 810 high-speed printer.

The system was acquired from Burcon, one of 40 distributors of Mits/Altair microcomputer products manufactured and marketed by Pertec Computer Corp.'s Microsystems Division.

The desktop hardware cost about $12,500, and Polichino wrote the route accounting software package himself for about $8,000. A minicomputer system for the same task

(Continued on Page 58)

Imsai Adds Desktop System

SAN LEANDRO, Calif. — Imsai Manufacturing Corp. has introduced the Series PCS-4X personal computer system, an integrated system that features an 8085 microprocessor, 32K/64K bytes of random-access memory (RAM), dual 5.25-in. floppy disks and serial and parallel I/O in a desktop cabinet.

Available in three versions, the PCS-40, PCS-42 and PCS-44, the series provides disk storage capacities of 180K, 400K and 780K bytes, respectively.

For a complete system, the user need only add a terminal; alternately, the system can be completed by adding a keyboard, video interface board and video monitor, Imsai said.

The system can be expanded with the addition of interface boards, RAM and disk drives.

The PCS-40, PCS-42 and PCS-44 cost $2,695, $2,995 and $3,695, respectively, from Imsai at 14860 Wicks Blvd., San Leandro, Calif. 94577.

Terminal System Self-Contained

HOUSTON — CMC Marketing Corp. has unveiled the TEI PT208, another model in its Processor Terminal series.

The TEI PT208 is a self-contained terminal system with display, disk storage, full keyboard and an 8-slot motherboard; it can be used either as a stand-alone processor or as a processor terminal in a larger system, the firm said.

The terminal features a 9-in. high-resolution monitor, a full Ascii keyboard with eight user-designated special function keys and a 16-key numeric cluster pad, as well as two Shugart Associates, Inc. SA-400 minifloppy disk drives, a spokesman said.

The 8-slot mainframe contains an MPU board featuring an 8080 processor and a special circuit that has a start-up "jump to" routine to any user-selected byte address, he noted.

Included are 32K bytes of static random-access memory (RAM). An additional RAM can be provided as an optional item.

The PT208 also has a disk controller which handles three minidrives; its I/O board provides three parallel and three serial ports. Outputs are RS-232 and TTL.

Optional software includes the CP/M operating system, Super Basic and Fortran.

The PT 208 is priced at $4,695 from CMC Marketing, Suite 515, 5601 Bintliff, Houston, Texas 77036.

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Utilities Work for TRS-80 Users

ORANGE, Calif. — Racet Computes has introduced Remodel, a software utility that allows users of the Radio Shack TRS-80 to renumber any portion or all of a Basic program, move any portion from one location to another or delete any range of lines.

Remodel will also readjust line number references where required, according to the firm.

The utility, which Racet said was designed to assist in creating well-organized, readable and easy-to-document programs, is available for 16K-, 32K- or 48K-byte units.

Another utility, Proload, extends the power of Remodel with features to load all or any portion of a basic program, combine Basic programs with renumbering and merging into any location, save combined/merged programs and verify bit-for-bit the contents of saved programs, Racet said.

A third tool, Copsys, allows users to copy system tapes generated from the Radio Shack Editor/Assembler program and can reportedly be used to duplicate those system tapes before they become damaged.

Remodel costs $24.95, Proload costs $14.95, a combination of Proload and Remodel costs $34.95 and Copsys costs $14.95 from Racet Computes, 702 Palmdale, Orange, Calif. 92665.

Debugger Built for Z80

PRINCETON, N.J. — Xitan, Inc. is offering Z Bug, a dynamic software debugging utility that the firm says provides techniques for developing Assembly language programs when used with Xitan's macro assembler.

Z Bug extends the standard debugging tools of memory, register examination and breakpoints by adding user-controlled data formatting, trap capabilities with tracing and expression evaluation of user-entered data.

Designed for use with a Z80 microprocessor under a CP/M disk operating system, Z Bug requires 13.25K bytes, including data areas. It is priced at $89 from P.O. Box 3087, 1101-H State Road, Princeton, N.J. 08540.

Vector MZ Supported

WESTLAKE VILLAGE, Calif. — Described as a disk operating system for Z80 and Micropolis Corp.' disk drives, MZOS from Vector Graphic, Inc. also features compatibility with software written for the North Star Computers, Inc.

MZOS was designed to support the Vector MZ system or a similar configuration. It incorporates several features to upgrade system performance, such as implied execution, which permits a file to be executed by just typing a name, the firm said.

MZOS allows the directory to be listed in two different formats, either in two columns for viewing 32 entries at once or in six columns for "fast" format.

MZOS costs $60 from any Vector Graphic dealer or from the firm at 31364 Via Colinas, Westlake Village, Calif. 91361.

Extender Card Eases Debugging Of Intel Units

SAN DIEGO — An extender card for Intel Corp.'s Intellec and Intellec II systems is now being offered by Electronic Solutions, Inc.

The Model 80 EX-2 raises the cards located in Intel's backplane card-cage combination to probe their test points for debugging purposes, a spokesman explained.

All of the standard and auxiliary contacts are brought through from the backplane to the extended connectors.

The extender card will reportedly operate with the 8080A, 8085, Z-80 and all other microprocessors compatible with Intel's Multibus. It costs $54 from Electronic Solutions, 7969 Engineer Road, San Diego, Calif. 92111.

Beer Distributor Brews Savings

(Continued from Page 57)

would have cost between $35,000 and $50,000, he said.

Coors Northeast has 10 routes. When its truck drivers complete their travels each morning, data from each of their sales tickets is entered into the system — some 300 entries daily.

By 10 a.m., management has a complete report on the day's sales, also reconciled with inventory. Previously this report wasn't available until late afternoon.

Polichiho noted that inputting data to the route-accounting system takes about the same time as with the old manual approach, but "we get data out of it 10 times faster."

The monthly sales report, which used to take two people two weeks to compile, now is available in four hours. A salesperson can easily inspect any account simply by having the CRT highlight sales "right up to today," Polichino said.

Previously, the salesperson would have to dig through old cards.

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Overseas Expansion Planned

Fiscal Control Brings 60% Growth at SI

By Marcia Blumenthal
CW Staff

ANDOVER, Mass. — Software International Corp. (SI) is located about 30 minutes away from the bustle of the Rt. 128 silicon loop surrounding Boston. Occupying the only modern building in this Colonial-styled bedroom community, SI definitely stands out.

The firm's growth has also been outstanding — with a compound annual growth rate of 60% since its founding 10 years ago.

Controlling this growth to assure financial stability has been the philosophy behind all the company's activities. SI markets two products, manufacturing and financial software packages, which it sells to a broad base of industries.

Future plans include expanding sales internationally and moving into the small business sector of the market.

SI got its start when IBM unbundled its software. William G. Watson, a founder and president of SI, had left IBM and formed a consulting firm. In his consulting work, Watson developed a general ledger system which could be used by almost anyone. After the IBM unbundling announcement, he saw a void in the market — a void for which he already had a product.

Fast Growth Risky

Donald K. Lane, executive vice-president, is also an ex-IBMer and has been with SI from its beginning. "I was a marketing rep for the insurance industry segment of IBM and it was boring; that's why I left. The opportunity to take a company from sales of $300,000 to $9 million in 10 years is a rare challenge," he said.

"We can't keep growing at 50% to 60% forever," Lane admitted, "but 25% to 30% would be good." Growing too fast is the greatest risk for SI because a company can easily outgrow its capital capability, he pointed out.

Therefore, one of SI's policies has been to hold down investing too heavily in the marketing side, Lane said. For instance, "if we sold too many packages, we would not have the technical capability to install and service those systems."

A sales staff doesn't bring in revenue right away, Lane observed, "so if you double the size of your sales staff at once, you don't get any return for a long time."

Eight years ago the company had one salesman; in 1976 the sales force numbered 10, then increased to 15 in 1977. It totals 22 this year.

Growth has come primarily from the sales and service of standard software packages, 99% of which have been developed in-house. SI's two major products are the Financial Management and Control System and the Manufacturing Resource Planning System.

Revenue for this year is expected to top $8.5 million, up 56% from last year's revenues of $5.9 million. The company has been profitable since its first year.

Standardization Policy

Sales of standardized software packages is another policy to which SI attributed its financial stability. "Customizing is not a way of life at SI," Lane said. "This year only $72,000 has been realized from customizing, which usually runs no more than 3% of our revenues.

"Our objective is to do no customizing, and we don't give our sales force extra commissions for big customizing jobs."

As part of its controlled growth ethic, SI has avoided being enticed into interesting product development. For example, turnkey systems "where we would provide the hardware as well as the software are attractive," Lane said, "but it can easily get a company in over its head."

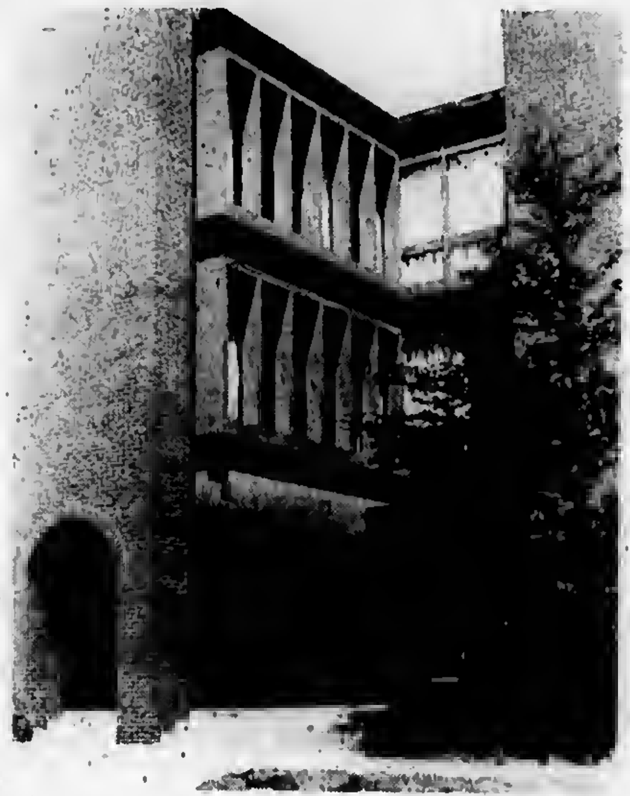
Instead, expansion has come from entering new markets. In the next year SI will begin offering a fuller range of products in the international sector.

The company has an extensive overseas agency system, with about 14 agents. It recently introduced its manufacturing package overseas.

A major emphasis for the next year will be marketing to small businesses. "A few years ago our major market was the Fortune 1,000 companies. Now that is changing, and we are offering our products to a wider base of small business users," Lane said.

The firm has announced or is committed to

(Continued on Page 62)



CW Photo by M. Blumenthal

George Washington didn't sleep here. SI's modern offices are a standout in this Colonial-style suburb.

Experts Contend Mainframers Must Break Design Barriers

By Marcia Blumenthal
CW Staff

NEW YORK — Mainframers, even those reaping bonanzas in the mini marketplace, are concentrating on achieving breakthroughs in the architecture of large-scale systems which will both reduce the costs and enhance the functionality — ease of use — of these systems.

However, versatility will also be a key to success in the computer market of the 1980s. Mainframers will have to develop not only large-scale systems, but also minis, terminals and software.

While processing speed is still an important consideration in designing large-scale systems, mainframe makers will have to increase functionality, reliability and security, as well as decrease the time needed to develop applications software, according to experts making presentations and predictions at a two-day technology seminar sponsored here by Martin Simpson Research Associates, Inc.

Richard H. Hill, director of systems and product planning for Honeywell, Inc., described two possible future hardware scenarios. Either users will spend less for hardware, investing instead in data networking and software, or expenditures for hardware will remain stable at about 40% of the DP user's budget, with the hardware mix changing.

Honeywell, Hill said, does not see a slackening in hardware expenditures as a percentage of total DP outlays, but he noted that distributed processing is helping fuel tremendous growth in the mini sector.

Users can now afford to waste processing time, Hill contended, because processing costs are dropping 20% a year and memory costs and data storage costs are declining 30% and 40% a year, respectively, with no

(Continued on Page 60)

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Experts Say Design Barriers Must Be Broken

(Continued from Page 59)

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Changing Role

Despite user acceptance of minis for distributed processing, Hill does not see mainframes going the way of dinosaurs in the future, but suggested large-scale systems will play a changing role in the DP environment of the '80s.

In the future, large mainframes will provide flexibility to support batch, transaction and time-sharing operations within a distributed environment. The large-scale unit, according to Hill, will become a processing utility, totally invisible to the end user. Data base management will be a major function for high-volume, high-speed processors.

However, despite the investment in large-scale system design, the market for mainframes appears to be shrinking. Hill estimated the growth at about 15% for the foreseeable future, but Robert T. Fertig, vice-president of Advanced Computer Techniques Corp. (ACT) and head of ACT's Technology Analysis Group, pegged the growth in the mainframe market at 10% to 11% annually in the coming decade. Fertig suggested that the current 12% to 15% growth for mainframes is a temporary surge resulting from the high demand for IBM's 30 series.

However, Neil Gorchow, Univac's vice-president of product strategy and requirements, emphasized that the central site accounts for the greatest dollar amount spent by users aside from software.

Fertig disagreed with Hill's assessment that hardware as a percentage of DP expeditures will remain stable. Relating his comments primarily to projections of IBM's strategies for the 1980s, he said that unless there is a major change in architecture, users will spend more on software-related items. The costs of new applications software with maintenance and service, Fertig said, will surpass the cost of hardware as a percentage of user costs over the next five years.

IBM's Future

"If IBM continues with the same organizational structure and products, it will have a $5 billion revenue gap by 1981," Fertig forecast, explaining that this gap was calculated using IBM's own projected annual corporate growth rate of 14%.

To avoid that gap, IBM will make a competitive foray into the U.S. services industry, including field engineering, systems engineering and program products, Fertig said, noting that this area of IBM's business is the fastest growing sector within the company, increasing 27.1% between 1976 and 1977.

With IBM's R&D investment at $1.3 billion and growing rapidly, Fertig said IBM will be investing heavily in office automation, communications and software.

In spite of the diversification into other product areas, IBM is not neglecting large system development, he noted. The firm's mainframe architecture, even for the 30 series, is 13 years to 14 years old. That architecture has problems with data rates and security and its reliabilty is "insufficient for the trend in on-line systems for the future," he added.

During the 1980s, IBM will address the problems of bus structure, data repository and directory and hierarchical storage, Fertig said.

The "H" series, to be introduced in the early '80s, will, according to Fertig, be based on "off-the-shelf" technology. The much-heralded series, which will permit upgrades from the 30 series, will incorporate distributed functions within a bus-oriented design, using very large-scale integration (VLSI) and will use chemical coolants for cooling chips and boards.

Fertig, as well as Gorchow, did not foresee any great technological leaps in the next five to seven years, when Josephson's Junction technology may become feasible.

Gorchow maintained that a prime motivation for technological research should be cost reduction. Univac, he said, has invested heavily in VLSI for the future.

Aside from developments in hardware, Gorchow stressed the need for a breakthrough in applications software. Programmer productivity has not kept pace with gains in hardware design. Programmers still produce only about 10 lines of code per day, he complained.

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But Key-to-Storage in Decline

Data Entry Segments Seen Growing 16%/Year

SAN JOSE, Calif. — Some segments of the data entry equipment market will grow at an annual rate of 16.2% during the next four years, increasing its U.S. revenues from approximately $1.1 million in 1977 to $2.3 million by 1982.

Optical character reader (OCR) equipment, general-purpose terminals and special-purpose data entry equipment, in particular, will show robust growth, Creative Strategies, Inc. (CSI) reported in a recently published industry study. Increased foreign marketing will contribute to the industry's growth, the report concluded.

However, the traditional data entry equipment segment, defined by CSI as key-to-storage equipment, will decline annually at about 3.4%, with revenues dropping from $560 million in 1977 to $470 million by 1982.

The giant share of future revenues will be funneled to what CSI termed the nontraditional data entry equipment segment. Portable data entry devices, now the smallest factor in the marketplace, are the fastest growing sector.

These portables are expected to generate $166 million in revenue by 1982, posting a vigorous annual growth rate of 29%, CSI forecast.

Otherwise, OCR equipment, spurred by increased demand for low-priced page readers and hand-held wands, will grow at the more sedate annual rate of 16.2%, which is the rate predicted for the nontraditional segment of the data entry equipment market.

Demand for CRT terminals will, according to CSI, push certain OCR companies to the forefront of the marketplace. The trend toward distributed DP, particularly in that part of the industry which is terminal-oriented, will in turn influence the demand for OCR equipment.

Aside from terminals, the need for factory input equipment, now a relatively small force in the marketplace, will grow at a compound rate of 17.5% during the next four years, creating further demand for OCR equipment.

Foreign markets are also seen as expansive outlets for data entry equipment. Not only are foreign markets growing but, CSI noted, the revenues from foreign buyers tend to be higher because they are derived from equipment sales rather than from rentals.

New Concepts

While the market for data entry equipment is expected to continue on the upswing, companies in this industry, particularly OCR vendors, are under continual pressure to develop product concepts that will allow their devices to be used for more than one or two applications, CSI pointed out.

Both hardware and software are involved in the design challenge, CSI said, with modular design seemingly the major need in the marketplace.

Developing systems — rather than individual devices — that can be incorporated into various data communications networks — now being implemented by mainframers is an important technology consideration for data entry equipment makers, CSI concluded.

Because the range of approaches to data entry products is diverse, competition is not currently concentrated. But several mergers have taken place recently, leading CSI to predict that in the future only a few companies will supply the bulk of the data entry equipment.

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"...we converted to the Fortex fixed asset system in 12 days... and met our standard closing schedule with no lost time!"

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With every software package, we offer expert technical support personnel, who have program experience *and* functional know-how. They are expert in not only system capability, but in documentation as well. Miss Johnson termed the PIMS systems documentation "...very complete".

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Whether you require a software package for fixed assets, credit, or accounts receivable, Fortex has a proven system for you. Our systems are running now in many top corporations; systems that are batch or on-line; systems that are providing requested functional data in a format and time frame desired.

We believe a system should give you the information you want, in the form you find most useful, at the time you need it. And that's why we designed our systems with true modularity and maintainability. We can tailor them to your functional requirements.

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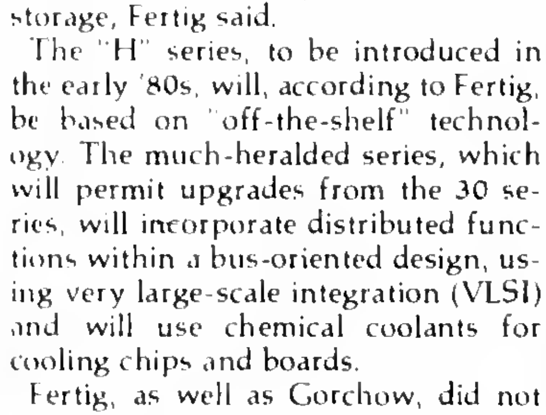

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SI Attributes 60% Growth To Careful Fiscal Control

(Continued from Page 59)

products to run on the IBM System/34, the Honeywell, Inc. H62 and the Hewlett-Packard Co. 3000.

Anticipating significant growth in the small business sector, Lane said SI will probably start forming smaller sales territories and hire less technically oriented salespeople who can talk to controllers and managers instead of managers of DP centers in large firms.

Taking products to industry-specific markets is another goal for the next fiscal year.

Modifying products is an ongoing task at SI; R&D expenses are 25% of revenues, Lane said. Next year the firm expects major additions to its financial package, which is now in its fourth version.

SI is also moving to putting systems on-line," Lane added.

Acute personnel shortages are now evident in some areas, Lane acknowledged, noting that personnel experienced in data base management and on-line systems are scarce.

CW Photo by M. Blumenthal

Don Lane

The firm, however, does not anticipate significant diversification and will remain specialized. Executives of the company suggested, however, that the continuing growth of the company, which claims it is the second largest U.S. software firm, may require public equity financing within the next three years.

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Contracts

National Semiconductor Corp. will provide up to $14 million worth of its Datachecker electronic supermarket systems to Acme Markets, Inc. of Philadelphia and Alpha Beta Co. of La Habra, Calif., over the next three years.

The Pertec Division of Pertec Computer Corp. has been awarded a $1.3 million renewal contract by Jacquard Systems of Santa Monica, Calif. Pertec FD510 floppy disk drives will be used in the Jacquard J100 minicomputer system.

Martin Marietta Data Systems has been awarded a contract to provide a minicomputer-based manufacturing software systems for Exxon Enterprises, Inc.

Kennedy Co. has received a $250,000 contract for its 9700 tape drives from Rolm Corp. for use in Rolm's computer-controlled automatic branch telephone exchange systems.

Interactive Sciences Corp. (ISC) has been awarded a three-year, $750,000 contract by the Dept. of Energy, Brookhaven National Laboratory. ISC will provide the Chemical Information System to government and private industry in North America and Western Europe.

Computel Systems Ltd. has received a contract for facilities management and systems development from the Saudi Arabian Ministry of Planning. Under the terms of the three-year contract, Computel will manage a data center with an IBM 370/145 in Riyadh, the capital city.

Recognition Products, Inc. has received a purchase contract worth more than $2 million from J.C. Penney Co., Inc. to supply optical character recognition (OCR) and readers for attachment to electronic point-of-sale cash registers in Penney stores.

Digital Equipment Corp. has signed a contract for delivery of eight dual TMS-8 text management systems with Gannett Corp. of Rochester, N.Y.

DBA Systems, Inc. has been awarded a $450,000 contract from Elgin Air Force Base to deliver a Graphic Attitude Determining System.

The Pertec Division of Pertec Computer Corp. has been awarded a contract of more than $200,000 from Sord Sunstone Computer Corp. of Independence, Mo., for Pertec's FD200 floppy disk drives, which will be used in the Sord Model 222 small business system.

Texas Instruments, Inc. has received an order from United Airlines for 1,900 Omni 800 Model 810 printers. The printers will replace 500 page writers and 1,400 ticket printers used in United's Apollo reservations system.

Dymac Division of Spectral Dynamics has received a $454,000 contract from Atlantic Richfield Co. for a computer-controlled machinery monitoring system to be installed at the Prudhoe Bay oil field on Alaska's North Slope.

Codex Corp. has been awarded a national noncommitment contract with AT&T's Bell System Purchased Products Divsion for the Codex 8200 local distribution service unit.

Computer Devices, Inc. has been awarded a $200,000 contract to provide Miniterm 1202 terminals to Steak and Ale Corp. of Dallas, Texas. The terminals will be used with a microcomputer-based cash register as a hard-copy I/O device to provide a mix, cost information, labor utilizaiton and other managment reports.

American Microsystems, Inc. has signed a $10 million two-year contract with Northern Telecom, Inc. for custom MOS large-scale integrated circuits.

Pertec Computer Corp.'s Service Division has signed a two-year contract to provide field maintenance to Key Tronic Corp.'s line of optical character recognitoin.

Honeywell Information Systems Ltd. has been awarded a $2 million contract by the Metropolitan Council of the City of Bradford, England, for a dual Series 60 Level 66 to handle applications covering financial services.

Texas Instruments Supply Co. has signed an agreement to purchase Applied Digital Data Systems, Inc.'s Regent 100 and 200 CRT terminals.

Informatics, Inc. has been awarded a subcontract by the American Geological Institute for the purpose of jointly undertaking a networking study funded by the National Science Foundation.

Computer Sciences Corp. has been selected to negotiate a contract with the National Aeronautics and Space Administration to provide computer systems engineering and DP support services to the Johnson Space Center at Houston, Texas. The total value of the five-year contract will have an approximate value of $70 million.

Rockwell International Corp. has received a $5.7 million Air Force contract for maintenance gear for satellite communications systems.

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DEC Year Revenues Up 36% As Earnings Show 31% Rise

MAYNARD, Mass. — Digital Equipment Corp.'s 1978 revenues rose 36% and earnings jumped 31% over last year's totals.

DEC President Kenneth H. Olsen attributed the company's performance partly to an "aggressive build-up" of DEC's selling and service capabilities.

"We have been particularly encouraged by the excitement in the marketplace caused by our 32-bit VAX-11/780 computer and, more recently, the 36-bit Decsystem-2020 computer. We also made important enhancements to our Decnet capabilities which further strenghten our position in the distributed data processing market," Olsen said.

Cautious About Future

While DEC is planning for growth for fiscal 1978, Olsen said the company is moving ahead cautiously, partly because of uncertainties in the U.S. economy.

Revenues for the year totaled $1.4 billion compared with $1.058 billion last year. Fourth-quarter revenues were $412.5 million, up 25% from the $330.3 million reported in 1977's last quarter.

Earnings for the year netted $142.1 million or $3.40 a share compared with last year's $108.5 million or $2.78 a share. Fourth-quarter earnings totaled $46.3 million of $1.08 a share, up from $41.1 million or $1.05 a share in the year-ago quarter.

Financial News

NCS Net Rises, Revenues Steady For Quarter

EDINA, Minn. — National Computer Systems, Inc. (NC) reported a 17% increasing in earnings for its second quarter. Revenues for the 1977 and 1978 second quarters, however, were about the same, totaling just over $7.4 million.

Net income for the quarter was $755,300 or 46 cents a share, compound with $647,100 or 40 cents a share in the corresponding quarter a year ago.

Six-Month Performance

Six-month revenues topped $13.8 million, up 21% from the $11.4 million reported in the year-ago period.

Earnings for the six months reached $1.2 million or 76 cents a share, a 22% increase from 1977 six-month earnings of slightly more than $1 million or 63 cents a share.

"Recent activities have been highlighted by our successful public stock offering. Also, orders for our Sentry scanning systems are running well ahead of plan," according to Charles W. Oswald, chairman and chief executive officer.

CCI Six Months See Earnings Gain, Revenues Lose

ROCHESTER, N.Y. — Despite a dip in revenues for the first six months of 1978, Computer Consoles, Inc. (CCI) showed an increase in per-share earnings.

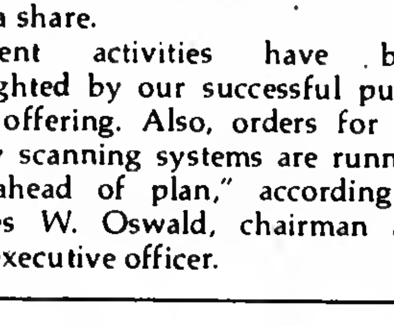
Revenues slipped to $7.1 million for the first half compared with last year's six month revenues of $8 million. Earnings increased, however, totaling $359,662 or 19 cents a share compared with $288,036 or 17 cents a share in the comparable 1977 period.

Major Directory Assistance System equipment acceptances were made during the first six months, with nine systems installed, CCI reported.

A Facilities and Equipment System and a Direct Access Intercept System were installed during the second quarter. However, the performance for the second half of 1978 is subject to timely acceptance of several large systems, the company noted.

Contract negotiations continued on the International Service Position System, CCI said, with four systems now planned for installation by mid-1979. Several other systems and enhancements are planned, according to the firm.

As of June 30, the firm had a backlog of 40 million and employed 405 people.



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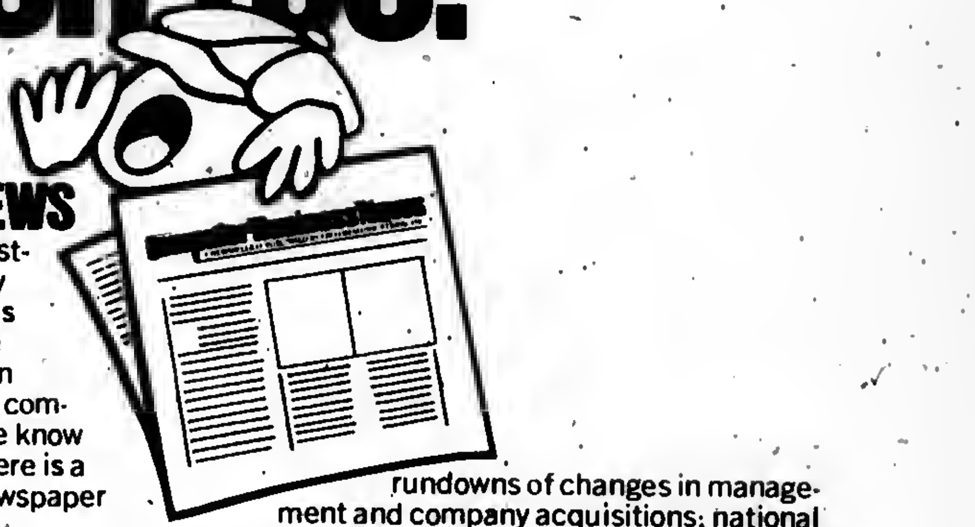

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Computer Business News

Foreign Orders & Installations

Two Japanese banks, the Takasaki Credit Bank and the Shokusan Mutual Bank, have ordered Univac 90/60 and 90/80-3 systems, respectively, valued at about $4.4 million from Nippon Univac Kaisha, Ltd.

The UK's Northern Engineering Industries has ordered seven Honeywell, Inc. Level 62 systems.

Systemplanning of Amsterdam, The Netherlands, has acquired the first IBM Series/1-based software package that DDP Products, Inc. has sold outside the U.S.

The Direct Revenue Administration of the Belgian Ministry of Finance has installed two NCR Corp. V-8570 Criterion systems for processing income taxes, real estate taxes, company taxes, automobile taxes and expenses.

Sabena Belgian World Airlines has ordered a Univac 1100/2 system and UTS 400 intelligent terminals valued at approximately $3 million. The equipment will be installed at Sabena's headquarters in Brussels and will be used for handling the airlines air cargo and message-switching applications.

The Swedish government has ordered 22 Honeywell Inc. series 60 Level 64 systems from CII-Honeywell Bull for installation in regional tax collection centers. In addition to handling tax collection and county financial and accounting tasks, the systems will be used for urban and planning administrative and statistical work.

Delta Systems, Inc.'s European distributor, ADS International in Germany, has ordered $4.6 million of Delta's products for the supermarket industry, general retail market and bars and restaurants. The company has also received a $750,000 order from the Australian market.

The Federation du Credit Mutuel de la Charente, based in Angouleme, France, has ordered an NCR Corp. V-8550 which will use NCR's Virtual Resource Executive operating system and two interactive systems, an I-8200 and an I-8250.

A Spanish automobile body manufacturer, Finanzauto S.A. of Madrid, has ordered a Univac 90/70 system valued at approximately $1.2 million.

Two Malaysian banks have ordered NCR Corp. systems. The development and Commercial Bank will install an on-line system based on an interactive I-8250 and NCR 2500 teller terminals. Public bank will install an I-8230 system that will be used initially for account processing.

Processamento De Dados Amasonas S/A, a Brazilian DP services firm, has ordered a Honeywell Inc., dual Series 60 Level 66 system from Honeywell Bull do Brasil S/A.

J.H. Rayner Ltd., a London-based commodities firm, has installed an NCR Corp. 8450 system to provide access to information on the commodities in which the firm deals.

Tokyo Sanyo Electric Co., a Japanese manufacter of refrigeration equipment, acoustic instruments and semiconductors, has installed a $2.6 million Univac 1100/11 system in its headquarters in Gumma Prefecture. The system was supplied by Nippon Univac Kaisha, Ltd.

Amsterdam Sonesta Hotel has installed a Philips Integrated Hotel System 2000. among the applications the system will handle are room management, guest accounting, telephone switchboard, marketing reporting and security.

Saibu Gas Co., a Japanese utility, has ordered a Univac 90/80-3 system valued at approximatley $1.9 million. The system will function as a duplex system with an already installed Univac 9700.

JDC Data A/S, a Danish service bureau, has ordered two NCR Corp. V-850 computers valued in excess of $2 million to expand the firm's on-line DP services.

New Companies

Katcard Systems International, Inc. has established an American subsidiary at P.O. Box 6900, Ogdensburg, N.Y. 13669. The firm will be responsible for marketing the KSL System 340 minicomputer and Manupacs, the manufacturing planning and control system that is run on the mini.

Info 3, publishers of DP training courses, has created a **Data Products Division** for marketing magnetic media and other system-related supplies. Its offices are located at Suite 193, 21241 Ventura Blvd., Woodland Hills, Calif. 91364.

Vista Computer, Inc. has been established to provide custom-designed business computer systems. Its offices are located at 2 Corporate Park Drive, White Plains, N.Y. 10604.

Canoga Data Systems has been formed as a division of Perkins Research, and Manufacturing. Based in Canoga Park, Calif., the company will produce fiber optics-based systems for the DP and telecommunications industries.

Computer Consulting Corp. has been formed to provide programming, consulting and software support. The firm is located at 4502 MacCorkle Ave. S.E., Charleston, W. Va. 25304.

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From our Bedminster, NJ headquarters, located on a beautifully landscaped 422-acre tract, AT&T Long Lines manages the network of long distance facilities that join together the telephone companies—both Bell and independent—throughout the nation. We also provide and maintain overseas cables that link U.S. telephones with the rest of the world.

Using large-capacity microwave radio relay systems, underground coaxial cables, and communications satellites, AT&T Long Lines telecommunications networks handle more than 35 million long distance calls a day, and transmit many other kinds of communications such as radio and TV programs, news stories and wire photos, and data services for business and government.

To keep pace with and anticipate the continually growing demand for our services, as well as to develop new and innovative applications for telecommunications, we are seeking professionals interested in the unparalleled opportunities we offer.

AT&T Long Lines has seven operating headquarters and 650 locations in 47 states. Aside from the obvious advantage of being a member of the largest corporation in the world, you will benefit in numerous other ways. For one thing, you will be working in a state-of-the-art environment, and utilizing the most advanced computers, software, circuitry and engineering/marketing concepts. You will be working closely with some of the most respected engineers, scientists, computer specialists, and marketing professionals in the country. These will include people not only at AT&T Long Lines, but also at Bell Telephone Laboratories—our R&D Unit—and Western Electric Company—our Manufacturing Unit.

Underlying it all is the pride, security, challenge, and exceptional professional career-growth opportunities that come with being a part of AT&T Long Lines.

At AT&T Long Lines, you will enjoy outstanding opportunities for professional career development, along with good salary and a benefits program that provides full protection and equity for you and your family. For prompt consideration, candidates should send resume and salary history in confidence (specifying departments of interest) to: AT&T Long Lines, Professional Employment Director, Room 5A110C, Bedminster, NJ 07921.

MARKETING OPERATIONS SUPPORT

Appropriate educational background will include an advanced degree (M.S, Ph.D.) in Operations Research, Statistics, Economics, Electrical Engineering, or equivalent work experience. Several years industry experience is desirable.

Algorithm Development

Responsible for the design and development of mathematical models and computational algorithms for various telecommunications marketing problems. Will also serve as internal consultant on matters pertaining to mathematical modeling and the development and programming of efficient computational algorithms. Preferred background would include a Ph.D. degree or equivalent work experience, and a strong background in network algorithms, simulation, systems design, and computer programming.

Competitive Analysis

Responsible for the technical support for the company's competitive analysis function, including the development of quantitative models, research methodologies and data bases for analyzing and predicting competitive behavior and planning Bell competitive strategies. The background should include an advanced technical degree or equivalent work experience. Must be capable of interfacing with clients and managing products with a minimum of supervision.

Marketing Planning

Responsible for the technical support for the company's marketing planning function, including the development of a planning data base, resource allocation models and quantitative models in methodologies to improve the planning and tracking process. A preferred background will include an advanced technical degree or equivalent work experience in corporate planning. Must be capable of interfacing with clients and managing products with a minimum of supervision.

Non-Uniform Pricing

Responsible for the development of marketing data for a non-uniform pricing project (i.e., data for price/demand elasticity curves). Will also be responsible for applications of the Business Voice Market Planning System (i.e., evaluation of the economic feasibility of new generation satellite systems). The preferred background will include an advanced technical degree or equivalent work experience in statistics and market research.

Data Management

Responsible for for the collection of customer data for the Business Voice Market Planning System, the development and maintenance of a data base system to store the data collected. A preferred background would include an advanced technical degree, or equivalent work experience, including some marketing background and a familiarity with voice products.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 101

MARKETING— FORECASTING & REGULATORY SUPPORT

Appropriate educational background will include an advanced degree in Statistics, Operations Research, Computer Science, or equivalent work experience.

Research Analysis

Responsibilities will include performing economic and statistical research and/or analysis required to develop and apply a variety of forecasting techniques tailored to the special conditions of forecasting interstate messages, revenues, etc. This requires a technical knowledge of econometrics, statistics, operations research, or computer science.

Systems Development

Responsibilities will include developing, implementing, and operating two manual and computerized systems. One is a complete revenue forecasting system; the other a system that will compare and reconcile outputs of existing forecast systems for construction and planning purposes. This position requires a technical knowledge of computer science and forecasting techniques.

Systems Design

This position will assist in the design and implementation of a computerized forecasting system. It requires a technical knowledge of operations research or computer science and two to three years experience in data systems design in industry.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 102.

BUSINESS RESEARCH DEMAND ANALYSIS

Econometrics (Statistical Research Analysis, Trend Analysis, Forecasting & Rate Evaluation)

These positions involve applying state-of-the-art techniques in micro-demand modeling and forecasting to telecommunications needs in business research, service costs and rates and marketing departments. Skills required: graduate level training in econometrics and micro-demand theory, strong background in statistics and demand modeling, excellent written and oral communications skills. Skills desired: market simulation experience, knowledge of cross elasticity studies, knowledge of FORTRAN, PL/1 programming, business experience in demand modeling and forecasting.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 103

MARKETING SALES SUPPORT

Appropriate educational background will include an M.S. in Operations Research or Computer Science, or equivalent work experience, with associated areas of study that include Optimization, Programming Systems Design, and/or Mathematics. Also desired, three to five years background in computer systems or operations research that includes some networking experience. In all of the following positions, where no existing techniques are applicable, basic research will be required to develop new techniques.

Algorithm Design

Will be responsible for the design, development, implementation, and training for specific algorithm modules within Advanced Communication System and other data network systems.

Administrative & Network Design

Will be responsible for the design, development, and implementation of specific modules within an administrative and network redesign system. Will also be responsible for establishing data collection procedures between AT&T Long Lines and all associated companies.

Systems Management

Will be responsible for the direct system operation and coordination of production for two marketing systems: a Switched Services Network Information System and an Automatic Message Accounting System. This position interfaces with field users, system designers, and headquarters users to define the activity required.

Customer Profile Subsystems

Will be responsible for directing activities involved in the development of a Customer Profile Subsystem and for assisting in the development of a Mechanized Collections System.

Customer Marketing Systems

Will be responsible for direct system operation and coordination of production for two marketing systems: a Customer Usage Tracking System and a Customer Oriented Market Model. This position interfaces with field users, sytems designers, and headquarters users to define the activity required.

Data Network Design

Will be responsible for the design, development, implementation, and training for specific modules within data network design systems.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 104

MARKETING—PRODUCT MANAGEMENT SUPPORT

Appropriate educational background for these positions will include a Master's degree in Operations Research, Mathematics, Statistics, Computer Science, or equivalent work experience. A background in market research or statistical consultation would be helpful.

Market Research/ Statistical Analysis

Responsibilities will include planning, executing, analyzing, and interpreting marketing projects involving market research and the statistical analysis of data. Projects are self-generated or are requested by product managers for the purpose of managing products, developing new services, advertising strategies, preparing material for the FCC, or supporting market activities.

Senior Quantitative Analyst

This position will be one of supervising several market research analysts. An advanced degree, preferably a Ph.D., or equivalent work experience in a technical area required, as well as two or more years experience in industry or education applying quantitative techniques, plus one to two years experience supervising a quantitative marketing team.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 105

MARKETING SYSTEM SUPPORT

Appropriate educational background will include a Master's degree in Computer Science or, most important, work experience relating directly to the job, i.e., experience in a specific type of software.

Software Development

Responsibilities will include demonstration of software development under the RSX-11M or UNIX operating system of the DEC PDP minicomputer. These systems will be generalized for industry oriented use in the Long Lines National Demonstration Center. Will also act as the developer of tailored demonstration software packages where required, using Bell System terminal products and services. Additional responsibilities will include software maintenance of DEC PDP minicomputers and the resolution of implementation problems involving these packages at trade shows.

Data Base Management Systems Programming

Responsibilities will include overall administration of the use of the National Sales Center as required by Headquarters Product Management and Marketing Management groups. The position will also oversee all software and hardware requirements for the center and will direct the resolution of all problems incurred, acting in a technical consulting capacity to product and market management groups. The position requires a strong background in systems programming, specifically in the DEC PDP minicomputer.

Customer System Support

Responsibilities will include coordinating all customer support activities for all Bell Modems, Low Speed Teletypewriter Terminals, and minicomputer systems that include the DEC PDP-11, data general NOVA, and similar systems. Minicomputer experience in sofware development and support maintenance is required.

Systems Programming Software

Responsibilities include support of the field sales organization in solving customer software problems. Background should include strong experience in systems programming on IBM equipment and in various programming languages. A knowledge of several operating systems, access methods, and data base management systems is required.

Systems Programming Hardware/Software

Responsibilities will include the support of the field sales organization in the solution of customer system problems. Background should include experience in mainframes (particularly IBM), front-end processors, access methods, data base management, time-sharing, application programming, protocols, line monitoring, terminals, and networks.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 106

DATA SERVICES

Appropriate educational background will include a B.S. or M.S. degree in Computer Sciences, Mathematics, or other related technical areas. Two to five years direct programming experience is desired.

IMS Data Base Management

Responsible for the development, design, testing, and maintenance of IMS systems software and supporting activities. Background should include operating systems software design and development experience and proficiency in COBOL, ASSEMBLER, or PL/1. Experience with control language, debugging techniques, and IMS/VS on-line applications is also desirable.

IMS Data Management Support

Responsible for development, design, testing, and maintenance of IMS systems software and supporting utilities. This will involve evaluation and implementation of new versions of IMS software and maintenance of existing IMS software. Background should include software design and development experience for operating systems and proficiency in COBOL, ASSEMBLER, or PL/1, and debugging techniques.

Minicomputer Software Technical Support

Responsible for technical support of minicomputer software and systems programming that includes operating system analysis and trouble resolution. Background should include mini/micro computer programming, mini-ASM, mini-BASIC, minicomputer systems and subsystem design, and telecommunications design experience.

Enhanced Product Application

Responsible for assisting in the design, implementation, and conversion of the Enhanced Product Application project that will store and provide customer profile information. Background should include experience in structured programming and design techniques, COBOL, OS/VS S370 computer environment and JCL, standard access methods, time sharing for development, testing and debugging techniques.

SORT/JCL Support

Responsible for the project leadership and support of SORT, JCL, catalog procedure and performance packages, and all Long Lines programming activities. Background should include 2 years experience programming ASSEMBLER and COBOL, strong JCL, experience with SORTS, and programming for IBM 370/145 (and up) with OS/VS, or MVS.

Scientific/Experimental Software Modeling

Responsible for performing analysis, design, and programming on several projects of a scientific or experimental nature in support of marketing, service costs, and business research users. Projects require close interaction with user groups in implementing and revising experimental modeling techniques and operational algorithms. Background should include programming experience with FORTRAN or PL/1, JCL, debugging techniques, structured programming techniques, and time sharing.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 107.

SERVICE COSTS & RATES

Microeconomics

Responsible for assisting in the development of various econometric pricing models. This will involve applying mathematical techniques and economic principles to a business problem, including development of a computerized EDP economic/mathematical model of pricing, general system design, programming, compilation of the input data, execution of studies, and documentation of both the methodology and results of the study. Preferred background will include a B.S. degree in Mathematics or equivalent work experience and knowledge of general economic analysis, computer subsystems design, analytical statistics, econometric modeling, and data base design.

Mechanized Information Systems

Responsible for assisting in the detailed definition and design of new or improved mechanized information systems and the maintenance of existing ones. Will assist in designing and implementing computer subsystems for various cost studies or rate plans for interstate services. Responsibilities will also involve performing data retrieval utilizing such systems as RAMIS, GIS/VS, or MARK IV. Preferred background will include experience in system, data base, and conversion design and cost benefit analysis.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 108

ENGINEERING

Human Factors

Responsible for human factors engineering of computer-based information systems. Will perform analysis, design, and implementation of materials associated with the interface between the computer and the user. Background should include a Bachelor's degree in Science, Psychology, or equivalent work experience, and knowledge of forms design, human factor analysis, and job design. A year of EDP in engineering, accounting, or personnel is desirable. Positions available in several locations.

Mechanized Information Systems

Responsible for the detailed definition and design of new or improved mechanized information systems and the maintenance of existing ones. Will also be called on to retrieve data using RAMIS, GIS/VS, or MARK IV. Background should include experience in systems and subsystems design, conversion design, and systems testing.

Motivational/Mathematical Statistical Research

Responsible for the application of scientific disciplines of social, motivational, and mathematical statistical research to the design, conduct, analysis, interpretation, and presentation of projects. Background should include an advanced degree or equivalent work experience, and one to three years of related experience that includes operations research and applied statistics. Knowledge of FORTRAN a plus.

Digital Information Micro Electronics

Responsible for work in the field of digital information transmission, including carrier, radio, and time division switched systems. Projects will involve field measurements of existing equipment and designing new equipment as needed. Background should include a Bachelor's or Master's degree in Electrical Engineering or Physics or equivalent work experience, and two to five years of relevant experience.

Minicomputer Software

Responsible for the design and development of software for a minicomputer environment. In addition, work will entail system support and current engineering. Preferred background should include 3 years' experience in software design and a B.S.E.E., M.S.E.E.; or a degree in other technical areas.

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Design, implement, test and document real-time software for minicomputer SIGINT systems for Special Projects. Software includes telemetry processing, command and control and display operation. Software may also include interactive displays, intercomputer communications and hardware device control. PDP 11/70 and RSX11 experience highly desirable.

Scientific Programmers

Develop scientific software associated with communications and surveillance systems including requirement definition, conceptual design, detailed design, coding, checkout and documentation. Areas include telemetry data processing and analysis, command generation and control, SIGINT mission planning and evaluation, orbit determination, orbit maneuver planning and space craft simulation.

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Develop data base related to scientific real-time systems applications. Responsible for data definition and data base design for multiple applications on large and minicomputer systems.

Software Engineers/ Systems Engineers

Perform conceptual design, hardware/software trade-off studies, requirements definition, functional design and computer systems architecture for SIGINT real-time and batch data acquisition and processing systems. Provide support and direction to individuals working on software development projects. May participate in new business proposals, contract negotiations and customer interface meetings.

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Cathie B. — Programmer Analyst, Michigan Consolidated Gas Co. "I joined the company as an accounting trainee in the properties department in 1973. I have a B.A. degree with a minor in accounting which has helped me to progress within the company. In three years, I was given Property Accounting supervisory responsibilities. I was then transferred to EDP as a programmer and appreciated the opportunity of receiving my computer training here. I now have responsibility for property accounting systems and benefit from my prior accounting experience. My career goal? I want to work in Systems Design."

Louise C. — Programmer Analyst, Michigan Consolidated Gas Co. "I have a B.S. in Industrial Management and am now involved in information system support planning, which provides data on departmental personnel requirements, budgets, staffing, etc. All information is stored in data base. My responsibilities include planning, setting up the data model, monitoring and summarizing. I've always taken advantage of the company's extensive training courses and am due to start soon in Information Management Systems. My next goal — Systems Analyst."

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—As major suppliers of natural gas to over 50 utilities in Michigan, Wisconsin and other midwestern states, the companies comprising the American Natural System are recognized leaders in America's Energy Business. Our current expansion activities include gas exploration development, transmission and gas storage services, synthetic fuels research, interstate trucking and a massive coal gasification project.

This planned and solid corporate growth provides great opportunities for rapid individual career path advancement. Our EDP staffers who successfully demonstrate their professionalism can progress quickly from **Programmer Trainee** to **Technical Advisor Programming, Senior and Consulting Systems Analyst, Business Analyst, Supervising Analyst, Supervisor Systems Development** and on to divisional management positions.

Working with our modern large scale equipment, opportunities exist to gain experience in virtually **any** professional EDP area, including **Support of Operating Systems, Data Bases, Computer Graphics, Planning and Financial Modeling, On-Line Systems, Business Systems, Scientific Modeling.** The following positions represent typical opportunities now open to you in all of the American Natural System companies. If your interests, career goals, educational background and professional experience is directed toward data processing, we should discuss the possibilities of your growing with us.

SENIOR MANAGEMENT SCIENTIST —Here's an opportunity to capitalize on your Phd. or masters degree in operations-research or equivalent experience. Additional degrees in Business Administration, Engineering or Computer Science would be a plus. You should have 5+ years diversified experience as an Analyst or Management Scientist in a business or industrial environment. Typical responsibilities in this key position include development of innovative research techniques that support analytical approaches to decision-making, using critical path scheduling, computer modeling, optimization, simulation and regression analysis, decision analysis procedures, etc. Following management approvals, project implementation responsibilities would be yours.

SENIOR COMPUTER SYSTEMS PROGRAMMER —Utilizing 2 to 4 years of programming and experience with new hardware, you will help a supervising analyst to plan, evaluate, select and install new software and hardware systems. Your technical expertise will help install and document procedures for proprietary software packages.

SENIOR PROGRAMMER ANALYST —Use your extensive diversified programming skills to analyze and resolve system changes and complex programs as project responsibilities. Design programs, determine appropriate languages, prepare costs, evaluate changes. You will also advise project teams on high level language usage and review their technical programs.

COMPUTER SYSTEMS PROGRAMMER —You can draw upon several years of programming and analysis to assist your supervising analyst in maintaining, testing, installing hardware and software systems including documentary standards and procedures.

SYSTEMS ANALYST —Working with a senior system analyst, you'll assemble systems requirements, evaluate designs, determine costs and benefits, prepare proposals with a team of analysts/programmers. Your experience should include diverse programming techniques.

PROGRAMMER ANALYST —An associate degree in computer sciences and some systems and programming experience can lead you to rewarding work with a senior systems analyst in solving computer logic prohlems.

These key EDP career growth positions offer high visibility to management and place you in a sophisticated professional environment supportive to implementation of your ideas. You'll appreciate the attractive total compensation plan, including generous benefits. The next move is yours! Start by sending your resume and salary history, in complete confidence to:

Placement Manager M.O.-7
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EDP/SYSTEMS AUDIT CONSULTANT

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The Hartford, a leading property-casualty insurance company, seeks to fill this challenging position in its EDP Audit Division.

This consultant will ensure that systems end data processing management is designing and operating DP production systems in accordance with established policies and procedures by:

- Performing operational audits of new computer applications under Project Life Cycle approach.
- Interacting with senior level management in order to provide evaluations of internal and external controls in these applications.
- Identifying any deficiencies in control and recommending improvements.

Qualifications include 2-3 years of data processing systems analysis experience coupled with 2 or more years of internel audit or finencial controls experience. Working knowledge of a programming language is essentiel. Bachelor's degree in accounting, computer science, math, or equivalent.

If you are a highly talented financiel systems analyst, this could be, your opportunity to break away from typical narrow guage EDP projects and take on responsibility for total systems accountability.

Submit confidential resume, including salary history and requirements to: Christina B. Machnich, Personnel Department, The Hartford Insurance Group, Hartford Plaza, Hartford, Connecticut 06115.

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SENIOR TECHNICAL WRITER: This position requires preparing text or manuals, brochures and technical articles that support our hardware or software products. Some involvement with customer proposed offers may be required.

This individual should have a minimum of 3 to 5 years experience as a writer in the computer field with a good background in electronics hardware. Position is available in Chippewa Falls, Wisc.

In addition to highly competitive compensation and benefits package, you will be joining a highly successful growing organization. Please submit salary history and resume in confidence to:

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You will find an environment that offers systems as progressive as you are, and the freedom to take advantage of the most sophisticated state-of-the-art available.

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Positions exist for individuals with minimum 3 years experience with emphasis in one or more of the following areas: COBOL, OS, BAL, OS JCL, CMS and CICS. You will be called upon to develop, and fine tune our applications programs to keep pace with our continuing growth and expansion.

SENIOR SYSTEMS PROGRAMMER

Major job functions will require you to support communications software in a TCS/VS/CICS environment, and analyze and resolve technical problems. Your background should exhibit a detailed and complete comprehension of VS operating systems, TCAM knowledge, 3-5 years systems programming experience in an OS/VS shop, specific knowledge of CICS internals and SMP, good verbal and written communications skills, and a willingness to perform goal maintenance skills.

SYSTEMS PROGRAMMER

Responsibilities encompass planning, generating and maintaining VS related software, analyzing problems in VS areas, and assisting the TP on-line area in testing and development. Proper job performance will require a technical knowledge of VM and its support, technical project leadership, 2-4 years OS/VS systems programming and development, basic communications knowledge, and the ability to supervise less experienced personnel.

BAL PROGRAMMER

Your two or more years of OS/VS BAL programming will be called upon to maintain and assure the operating systems' PTFs, as well as make the necessary corrections. Additionally, this position will involve continual product and research development, assisting the TP on-line group with fixes and code changes for TCS, TCAM, and Securities/Commodities Order Match. This position requires OS/VS HASP technical skills, knowledge of VM, ability to evaluate software problems and associated areas, and good verbal and written communication skills.

SYSTEMS ASSURANCE TECHNICIANS

We seek individuals possessing the ability to code JCL, coupled with IBM 360/370 operating system and OS/VS experience. You will be called upon to test, and debug general program ABENDS. 2 years operations experience required.

Compensation will be commensurate with experience. Also included is a comprehensive benefits program. For prompt consideration, please call or forward your resume indicating position sought and salary history, in confidence to:

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Data Processing

Decision Support Software Opportunity

Northwest Industries, a $2 billion multi-industry company, is a leader in top management and staff use of decision support and mathematical modeling systems. We are establishing a Corporate Management Information Services staff position with responsibility for EXPRESS and other advanced software. EXPRESS is an advanced software package with analytic, modeling and data base capabilities. It is the application software basis for our interactive systems serving 75 users in a new IBM 158-AP VM/370 in-house environment.

The position — SENIOR SOFTWARE SPECIALIST — will require software excellence in a highly professional team oriented environment.

The successful candidate will have total responsibility for EXPRESS and will maintain effective liaison with:

- application consultants
- system software specialists
- the EXPRESS vendor, Management Decision Systems (MDS)

Prerequisites should include in-depth experience in one or more of the following areas:

- substantive analytic package support
- systems internals (particularly VM/370)
- degree in computer science or mathematics

This position provides a high degree of challenge, reward, professional development, and offers an attractive compensation package. To explore this opportunity, please respond with a resume or letter to Laurance T. Burden, Director-Management Information Services.

Northwest Industries, Inc
6300 Sears Tower/Chicago, IL 60606
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Programming

Systems & Software Professionals

TTI Welcomes You to ...the 21st Century.

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A fast-rising subsidiary of the pace-setting Citicorp, TTI seeks dynamic individuals who would like to meet the challenges ahead, and expend their expertise in an exciting state-of-the-art environment. Our current career assignments include:

SYSTEMS ENGINEERING

Play a lead role in the planning and architecture of a transaction processing system which will be oriented to concurrently accommodating interactive and batched financial transactions via a shared file facility. Experience in design and development in some of the following areas is required: Operating Systems, Data Base Management, Transaction Processing, Financial Applications, Distributed Processing.

SYSTEMS SOFTWARE

Design, develop, and support system software for delivery of transactions to financial applications within our network. Areas of concern include operating system support and enhancement, network security, transaction routing, network configuration management, and failure/recovery mechanisms.

COMMUNICATIONS SOFTWARE

Design and develop software to operate the set of communications processors within our expanding transaction processing network. Familiarity with communications protocols and packet-switching concepts is desired.

SOFTWARE TEST AND VALIDATION

Formulate test methods and develop test drivers and validation tools to support the implementation and subsequent evolution of our new network. A background in software and systems testing methodology for large scale systems is required.

SYSTEM PERFORMANCE ANALYSIS

Define and establish performance monitoring facilities for measuring response, resource utilization and congestion in a widely distributed transaction processing network. Models and empirical techniques will be developed for configuration planning and cost/performance analysis. Data reduction and statistical analysis programs will be developed.

APPLICATIONS SOFTWARE

Design, develop, and support on-line applications which provide consumer-oriented financial services through delivery points at both bank and retail locations. These applications cover the full spectrum of consumer banking services. A background in operating systems, real-time systems, or related on-line applications is desired.

DATA BASE MANAGEMENT

Design and administer large distributed data bases and associated access mechanisms for use by continuous operation applications which process very large transaction volumes. A background in either development or utilization of Data Base Management Systems is required; openings exist at various levels.

All positions require extensive background in on-line real-time systems, experience with large data bases, and knowledge of communication networks. BS, MS, PhD or equivalent related experience preferred. Send resume to **Lynn Anderson, Dept: 40, or call COLLECT: (213) 879-1212.**

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DATA PROCESSING

E G & G Idaho, Inc., the prime operating contractor to the U.S. Department of Energy at the Idaho National Engineering Laboratory, (INEL) has current opportunities for senior professionals:

SCIENTIFIC SYSTEMS PLANNER

You should have at least 8-10 years' experience in CDC scientific systems and a technical degree or equivalent. The work functions will include system design, selection and procurement with performance monitoring to be done on existing and future systems. Knowledge of scientific data base systems is desirable.

BUSINESS SYSTEMS PLANNER

You should have at least 8-10 years' experience in IBM 360/370 (or equivalent system). An appropriate degree or equivalent experience is required. The work functions will include system design, selection and procurement with performance monitoring to be done on existing and future systems. Knowledge of data base management systems is desirable.

COMMUNICATIONS SYSTEMS PLANNER

You should have at least 5-10 years' experience in remote batch and interactive communications. Both large scale system and minicomputer background is desired. A technical degree or equivalent experience is required. The work functions will include system design, selection and procurement. Network performance monitoring will be done on the existing or future networks.

SENIOR SYSTEMS PROGRAMMERS

You should have at least 5-8 years' experience in the analysis, development and maintenance of system software for the CDC CYBER 173 computer system. A technical degree or equivalent experience is required. Knowledge of software internals and proficiency in the maintenance of the CDC CYBER operating systems is required to perform functions of software development and maintenance.

You should have at least 5-8 years' experience working with CDC CYBER software, user method development, and user interface functions. A technical degree or equivalent experience is required. Work functions include developing/maintaining CYBER system user methods, system information bulletins/manuals and interfacing with users to identify, analyze and design software requirements.

COMPUTER TRAINING COORDINATOR

Responsibilities will include the development of effective training programs for computer operations personnel, including computer operators and data entry personnel. Candidate should have a degree in Computer Science/Mathematics, or equivalent experience, with at least 3-5 years' experience in operating large scale IBM and CDC computer systems. Should possess effective communication skills.

The Idaho National Engineering Laboratory has installed a CDC CYBER 76, a CYBER 173, and an IBM 360/75 in its Computer Science Laboratory. The Computer Science Laboratory has the responsibility for hardware and software configuration planning and the operation of the present system.

Idaho Falls is a medium-sized community, located close to top-flight winter sports areas (Sun Valley, Jackson Hole, Grand Targhee) and unexcelled summer recreation areas (Yellowstone, the Salmon and Snake Rivers, The Grand Tetons)

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All replies will be held in strict confidence.

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Knauf Fiber Glass, a new name in fiber glass insulation, is seeking a degreed candidate for Manager of Procedure Development.

The individual we desire will be required to establish standard procedure formats and document corporate procedures and techniques covering a broad spectrum of business, administrative and operations functions.

Knauf Fiber Glass is interested in candidates with a manufacturing background, interested in stable employment and with 2 to 3 years experience in corporate procedure analysis and development.

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New opportunities due to our rapid growth are presently available in data processing for programmer/analysts whose responsibilities will include applications in accounting, material requirement planning, order entry/billing, shop floor control and other areas. Your work will be primarily in new development, and in defining applications, designing and programming, and installing the applications with project leaders supervision.

Position requires a minimum of 3 years OS applications, with high proficiency in ANS and COBOL. Must have personally designed, program and installed a multi module medium to large scale OS application. Other helpful experience would include on-line transaction applications (CICS), interactive programming (VM/370), BOM, MRP, shop floor, costing, inventory, and structured designing and programming.

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Data Processing

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Includes the functions of network coordination and planning as well as network standards and training and documentation administration.

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We seek network analysts to assume responsibility for the planning, ordering and testing of new products or services prior to release for use. Candidates must have 3-5 years strong hardware/software and testing experience.

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Will prepare and maintain project control reports, budget analysis and perform other administrative functions relating to the project. Requires a Bachelors in Business, Engineering or a related discipline along with related experience in project administration.

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XDS/HONEYWELL: SIGMA 3,5,7,9,; 930
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SENIOR SYSTEMS ANALYST —3-5 years experience as a systems analyst including DOS/POWER/VS; ANS COBOL; DATA COMMUNICATIONS/DATA BASE (CICS). Specific experience as a project leader in insuranca data processing required. Property and casualty (premium accounting and claims processing) desirable.

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Computer Scientists

San Francisco Bay Area

Excellent career opportunities currently exist at the Lawrence Livermore Laboratory for experienced Computer Scientists. The Laboratory is involved in applied science R&D and is operated for the Department of Energy.

Lawrence Livermore Laboratory has one of the largest high-speed computer systems in the world, including extensive interactive time-sharing capability. Our needs require that we constantly advance the state-of-the-art in the computer field. We heve an immediate need in the following areas:

SYSTEMS INTERFACE

A Software Consultant is needed with excellent interpersonal skills to coordinate consultant services to the user community. Will elso assume responsibility for establishing future consulting ectivities end policy, training other consultants, and providing programming support in the areas of library and utility routine software. Will be expected to keep abreast of software developments es required to maintain an effective consulting service. This position offers the opportunity to broaden one's knowledge of operating systems end local networks. Applicants should have a minimum of 3 years' strong computer experience in a large scale machine environment with an emphasis on FORTRAN and debugging techniques. A knowledge of timesharing and user-oriented systems software or a knowledge of the CDC software product set is highly desirable.

DOCUMENTATION AND EDUCATION

A Computer Scientist with a strong background in educational theory and techniques is needed to plan, organize and implement e computer education program. Activities include investigating end developing computer-assisted and video-assisted instruction. Our educational effort is directed toward improving skills of our computer users as well as providing professional development of computer science personnel. This job may also involve user consulting functions. Applicants should have a minimum of 3 years' experience in Computer Science es well es experience in educational theory and techniques. And advanced degree in Computer Science and a knowledge of large scale computers and timeshering is highly desirable.

If you have skills to offer in the above areas, or computer experience that may match our wide renge of other career opportunities, please send your resume and salary history and requirements to Roger Wong, Employment Division, Lawrence Livermore Laboratory, P.O. Box 808 Dept. KCW-108, Livermore, CA 94550. U.S. Citizenship Required. An Equal Opportunity Employer M/F/H/V.

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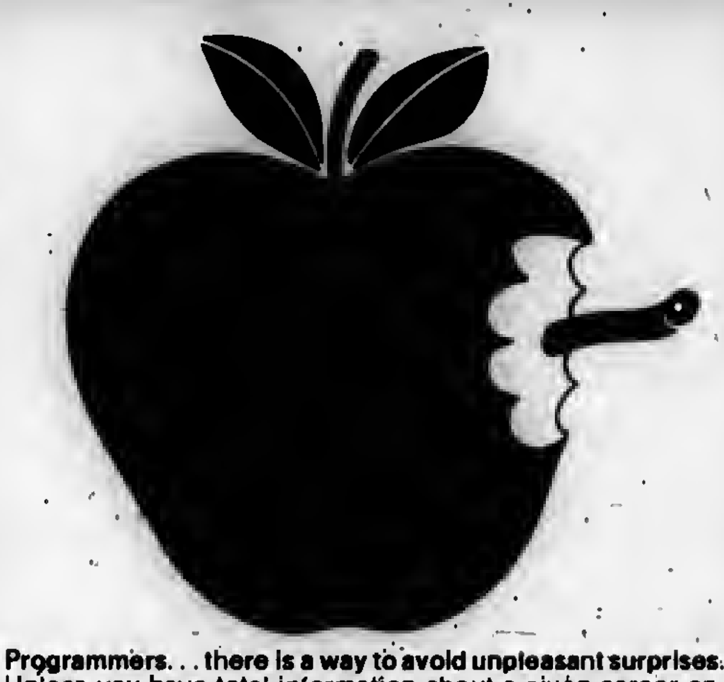

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You will be involved in the performance analysis of compiler, data management and network products. Positions include performance test base development, test plan development and development of performance analysis tools for standard scientific software products.

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Prior background in Honeywell software support. Requires thorough knowledge of GCOS, GMAP and GRTS.

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Should have at least six years background utilizing Honeywall software and H6000 equipment. COBDL programming experience to include materials/maintenance management applications. Other backgrounds may be considered based on training and experience.

In addition to paying your transportation and relocation expenses. Bell Helicopter will provide you with a highly-competitive income and a generous benefits package which includes e housing supplement, travel end cost-of-living allowances, end overseas bonuses

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Requires experience using IBM assembler language in an OS, DOS or PARS/ACP environment; experience using PL/1 in an IBM CICS/OS environment; or experience using IMS in a DB/DC environment.

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PROGRAMMER/ANALYST

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We are a Southeastern based Data Center of a Fortune 500 manufacturer with immediate needs for experienced Systems personnel. In addition to these immediate openings, we have budgeted positions for January 1979.

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For large-scale computing system. Compiler or data-base experience is helpful. Position requires routine software maintenance, with emphasis on compilers, libraries, and data-base processors.

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Programmer/Analyst

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Applications should be sent to: Personnel Office, P.O. Box 3422, University Station, Laramie, WY 82071. Applications must be received by October 16, 1978. The University of Wyoming is an Equal Opportunity, Affirmative Action employer.

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Maryland based headquarters of Management Services organization has immediate openings for high level, technically skilled programmers with proven record of accomplishment. Minimum 5 years' total experience in ANSI-COBOL language, knowledge of FORTRAN helpful. This experience should include 3-4 years' on large scale systems such as:

Honeywell 6600 with knowledge of TDS and IDS desirable.

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Applicant should have a doctorate degree and a significant experience in consulting related to scientific computing. It should be a senior person who can fill a half-time Associate or Full Professor position in an academic department. Given all other qualifications equal, an applied mathematician or statistician will be given preference. Previous managerial experience is highly desirable.

Persons interested should submit applications, vita, and names of three references to: Office of Systems and Computing, 338 French Administration Building, Washington State University, Pullman, Washington 99164, before November 17, 1978.

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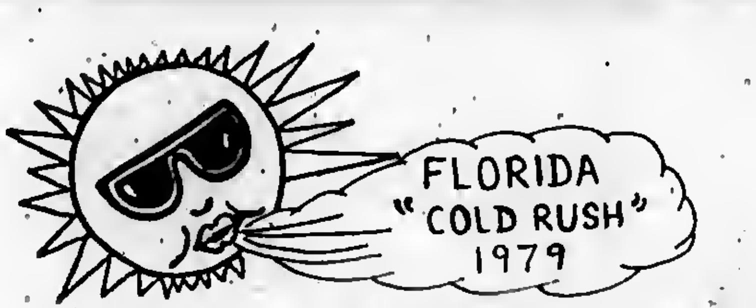

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AVAILABILITY

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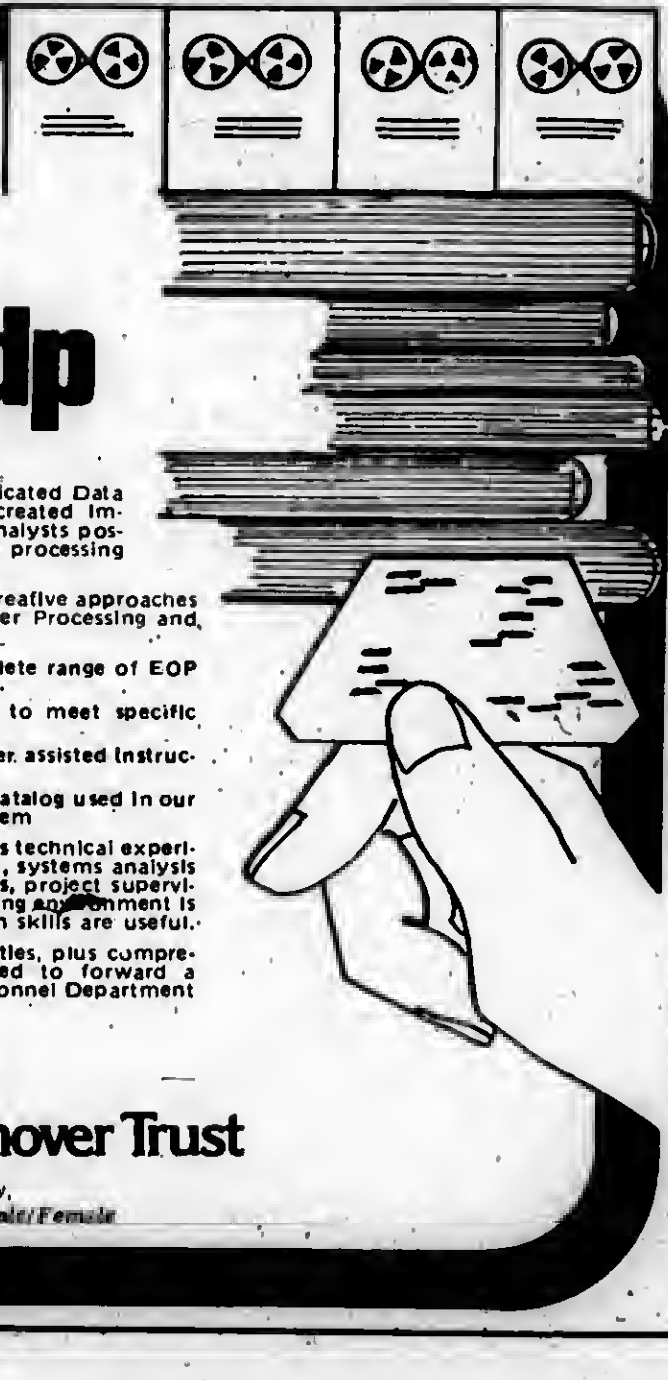

senior education analysts/edp

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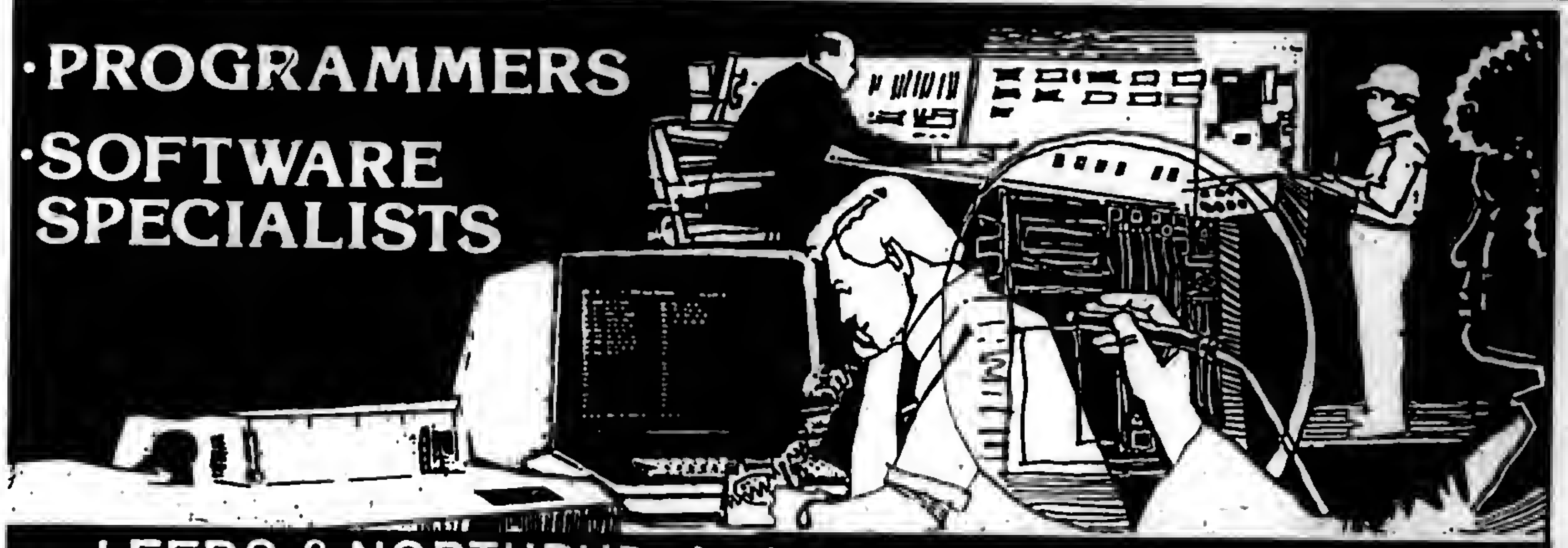

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Please send your resume to: Mr. Ed Epperson, Corporate Employment Manager, ITT North Electric Company, P.O. Box 688, Galion, Ohio 44833.

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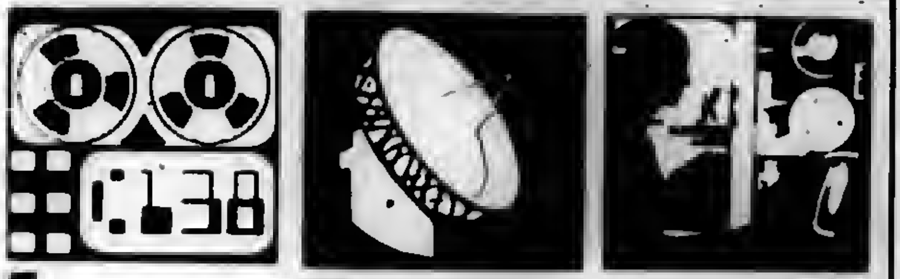
PDP 11/70

Systems Support Analyst I. Position requires 1 to 2 years experience with a PDP 11 running RSTS/E, experience with IAS helpful but not required. Position will be responsible for maintaining technical libraries of documentetion and software. This position will report to the PDP-11 Project Leader. Annual starting salary: $14,070.

Applicants for all positions must be able to communicate effectively with management and technical personnel, both verbally and in writing. Salary history should also be included with resume. Application period ends 12/October/78. Resumes are to be sent to Arizone State University, Personnel Dept., ASB 310, Tempe, AZ 85281. A criminal history check will be required of all successful applicants. Arizona State University is an Equal Opportunity/Affirmative Action Employer.



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Interested individuals should call Pat Fitzgerald at 800-227-8433 Ext. 6601 (within California call collect (415) 494-7400, Ext. 6601) or send resume to her at Dept. PF-B5.

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4. Serves as the chairperson of the District Management Information Services Steering Committee which establishes MIS project priorities to be Peveloped. Implemented and evaluated in accorPance with the short and long-range of the Management Information System.
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6. Performs other relateP Puties as assigneP by the Assistant Superintendent for Management and BuPget.

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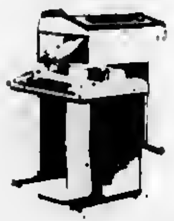

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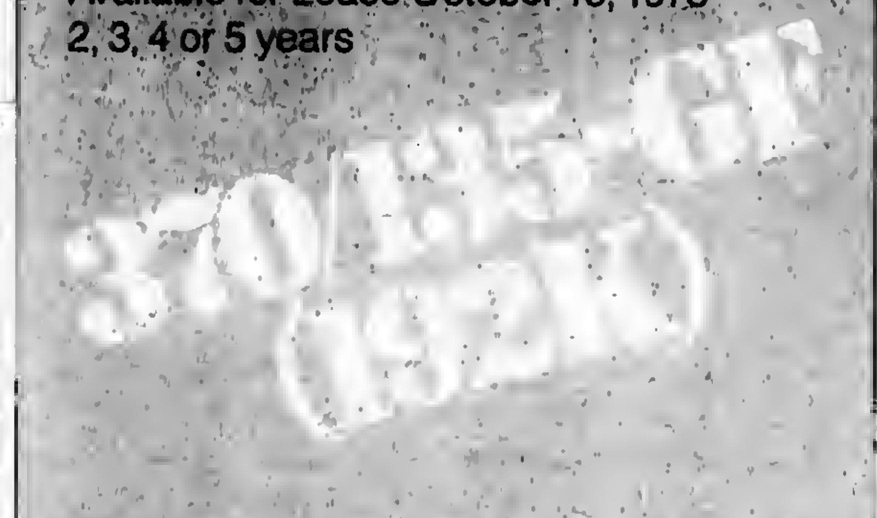

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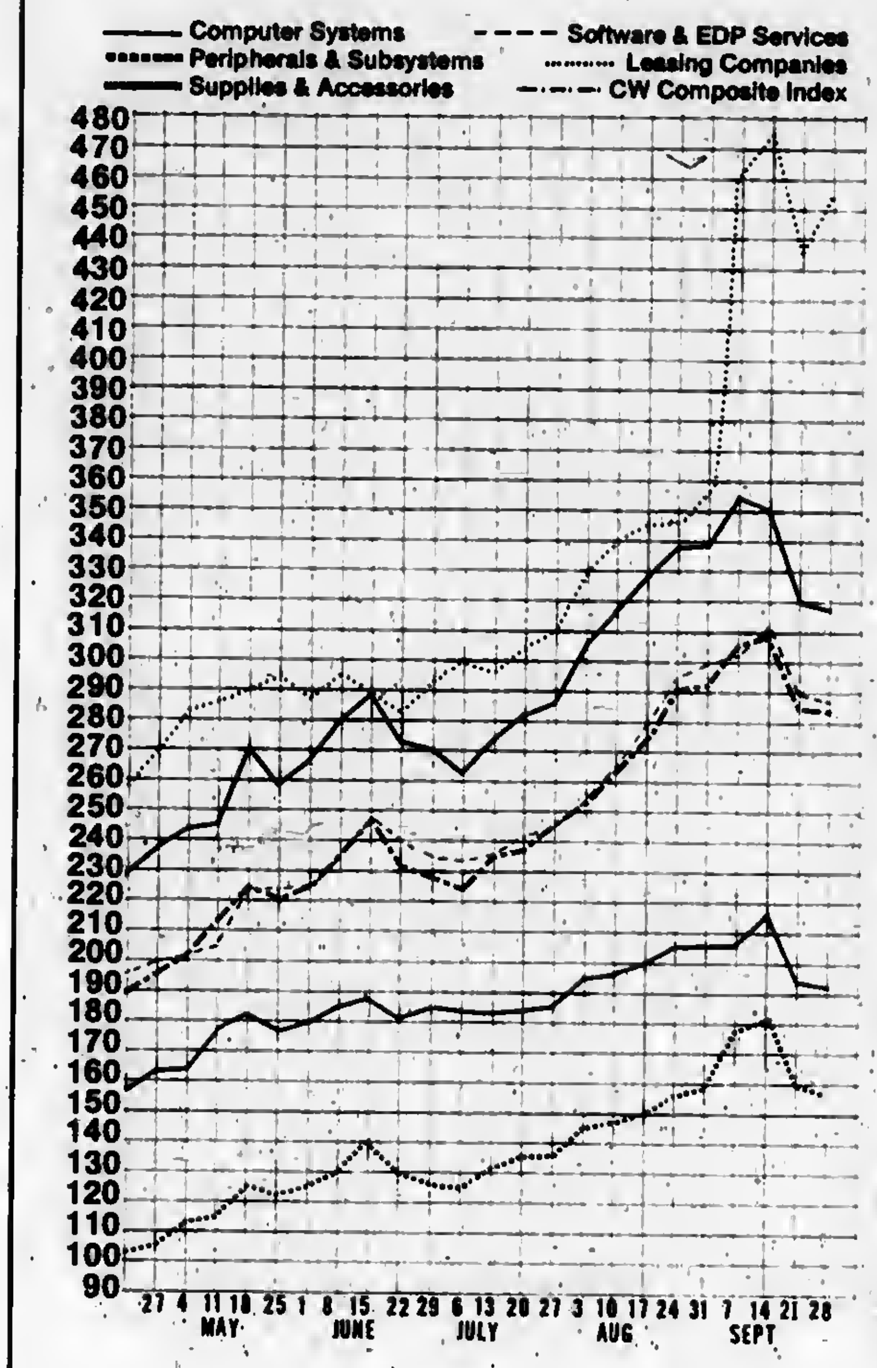

Earnings Reports

MOTOROLA
Three Months Ended June 30

	1075 (000)	1977 (000)
Shr Ernd	$1.06	$.92
Revenue	545,221	459,696
Earnings	32,912	27,817
6 Mo Shr	1.99	1.71
Revenue	1,041,010	876,860
Earnings	60,548	51,835

NORTHERN TELECOM
Three Months Ended June 30

	a1978	a1977
Shr Ernd	$.99	$.93
Revenue	366,381,000	342,415,000
Tax Cred	2,356,000	808,000
Earnings	27,289,000	24,783,000
6 Mo Shr	1.79	1.70
Revenue	876,312,000	649,909,000
Tax Cred	4,712,000	1,186,000
Earnings	48,385,000	45,065,000

a-Amounts in Canadian dollars.

TEKTRONIX
Year Ended May 27

	1078	1977
Shr Ernd	$3.19	$2.40
Revenue	598,866,000	454,958,000
Earnings	58,848,000	43,971,000
3 Mo Shr	.83	.80
Revenue	150,842,000	125,308,000
Earnings	14,867,000	14,172,000

COMPUTER NETWORK
Three Months Ended June 30

	1075	1077
Shr Ernd	$.25	$.26
Revenue	4,671,000	3,377,000
Earnings	423,000	319,000

DATA 100
Three Months Ended June 30

	1078	1977
Shr Ernd	$.18	$.33
Revenue	39,894,000	33,411,000
Tax Cred	.....	155,000
Earnings	1,111,000	1,237,000
6 Mo Shr	.43	.68
Revenue	78,841,000	62,348,000
Tax Cred.	.....	295,000
Earnings	2,553,000	2,551,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 27, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

EXCN		1978 RANGE (1)	CLOSE SEP 27 1978	WEEK NET CHNGE	WEEK PCT CHNGE
		PRICE			
	COMPUTER SYSTEMS				
A	AMDAHL CORP	28- 69	55 1/4	-2 1/8	-3.7
N	BURROUGHS CORP	59- 87	76 1/8	-1 1/2	-1.9
O	COMPUTER AUTOMATION	23- 44	33	+ 1/4	+0.7
N	CONTROL DATA CORP	23- 44	36 1/2	- 1/4	-0.6
O	CRAY RESEARCH INC	21- 74	61	+1	+1.6
N	DATA GENERAL CORP	42- 71	61 7/9	-2 5/8	-4.0
N	DATAPOINT CORP	34- 75	65 5/8	- 3/8	-0.5
N	DIGITAL EQUIPMENT	39- 54	49 3/4	- 3/8	-0.7
N	ELECTRONIC ASSOC.	2- 13	9 3/4	+1	+11.4
A	ELECTRONIC ENGINEER.	11- 19	14 3/4	+1 1/8	+8.2
O	FOUR-PHASE SYSTEMS	19- 46	38 7/8	+1 1/8	+2.9
N	FOXBORO	28- 40	37 1/4	+ 3/4	+2.0
O	GENERAL AUTOMATION	7- 26	18 1/9	- 1/8	-0.6
O	GPI COMPUTER CORP	1- 2	1 3/4	0	0.0
N	HEWLETT-PACKARD CO	62- 93	85 7/8	- 1/4	-0.2
N	HONEYWELL INC	43- 72	64 3/9	- 7/8	-1.3
N	IBM	236-305	275	-9 1/2	-3.3
O	MANAGEMENT ASSIST	9- 29	21 1/2	-1	-4.4
O	MICRODATA CORP	10- 23	18 1/2	-1	-5.1
O	MINI-COMPUTER SYST	5- 8	7 1/2	- 3/8	-4.7
O	MODULAR COMPUTER SYS	7- 17	13 1/2	-1 1/4	-8.4
N	NCR	37- 67	59 5/8	-2 7/8	-4.5
N	PRIME COMPUTER INC	23- 43	35 1/4	+1 5/8	+4.8
N	PERKIN-ELMER	17- 28	25	- 1/8	-0.4
N	RAYTHEON CO	29- 58	47 3/8	-1 1/8	-2.3
N	SPERRY RAND	33- 49	44 1/4	-1 3/8	-3.0
A	SYSTEMS ENG. LABS	11- 24	16 3/4	- 3/8	-2.1
A	WANG LABS.	12- 32	25 3/8	- 1/4	-0.9
	LEASING COMPANIES				
O	BOOTHE COURIER CORP	13- 20	19 1/4	0	0.0
O	COMDISCO INC	5- 19	17 3/4	+ 1/2	+2.8
A	COMMERCE GROUP CORP	1- 1	5/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	5 1/4	+ 3/8	+7.6
M	DATRONIC RENTAL	1- 2	2 1/4	+ 3/8	+20.0
A	DCL INC	3- 5	4 3/8	- 1/8	-2.7
N	DPF INC	8- 14	11 3/8	+ 3/8	+3.4
N	ITEL	16- 36	31 7/8	+1 3/8	+4.5
N	LEASCO CORP	24- 36	31 3/8	+ 5/8	+2.0
O	LEASPAC CORP	1- 4	2 1/2	0	0.0
A	PIONEER TEX CORP	4- 7	5	+ 3/8	+8.1
N	U.S. LEASING	13- 20	17 7/9	+ 1/4	+1.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1978 RANGE (1)	CLOSE SEP 27 1978	WEEK NET CHNGE	WEEK PCT CHNGE
		PRICE			
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 1/2	- 1/8	-7.6
O	ANACOMP INC	8- 22	16 1/4	+1	+6.5
A	APPLIED DATA RES.	8- 17	15	- 3/8	-2.4
N	AUTOMATIC DATA PROC	24- 36	31	+ 1/4	+0.8
O	COLEMAN AMERICAN COS	1- 2	1 1/2	- 3/8	-20.0
O	COMPU-SERV NETWORK	7- 12	8 1/4	+ 1/4	+3.1
O	COMPUTER HORIZONS	1- 9	8 1/4	0	0.0
O	COMPUTER NETWORK	8- 16	11 7/8	+ 1/8	+1.0
N	COMPUTER SCIENCES	8- 17	14	+ 1/2	+3.7
O	COMPUTER TASK GROUP	1- 4	3 1/4	0	0.0
O	COMPUTER USAGE	2- 4	3 3/4	+ 1/4	+7.1
O	COMSHARE	6- 19	17 1/4	- 1/4	-1.4
O	DATA DIMENSIONS INC	4- 9	7 1/8	- 7/8	-10.9
O	DATATAB	1- 2	1 3/8	+ 1/8	+10.0
N	ELECTRONIC DATA SYS.	15- 25	21 7/8	- 3/4	-3.3
O	INSYTE CORP	1- 3	1 3/4	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3 1/4	0	0.0
O	KEANE ASSOCIATES	3- 6	6	0	0.0
O	KEYDATA CORP	1- 3	2	0	0.0
A	LOGICON	11- 19	15 1/4	-1 3/4	-10.2
A	MANAGEMENT DATA	1- 1	7/8	0	0.0
A	NATIONAL CSS INC	15- 36	30 5/8	+ 7/8	+2.9
O	NATIONAL DATA CORP	7- 13	13 7/8	- 5/8	-5.4
A	ON LINE SYSTEMS INC	17- 30	26 5/8	- 1/4	-0.9
N	PLANNING RESEARCH	4- 10	8 5/8	0	0.0
O	PROGRAMMING & SYS	1- 1	1 1/4	0	0.0
O	RAPIDATA INC	3- 7	6 1/2	+ 3/8	+6.1
O	REYNOLDS & REYNOLD	18- 36	28 1/2	-1 1/2	-5.0
O	SCIENTIFIC COMPUTERS	3- 9	8 3/8	0	0.0
O	TYMSHARE INC	18- 33	27 3/8	-2 1/2	-8.3
A	URS SYSTEMS	5- 8	7 5/8	+ 7/8	+12.9
N	WYLY CORP	1- 7	5 7/8	- 3/8	-6.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	14- 32	26 5/8	- 1/8	-0.4
O	ADVANCED MEMORY SYS	7- 18	16 3/8	- 1/8	-0.7
N	AMPEX CORP	10- 19	16 1/4	0	0.0
O	ANDERSON JACOBSON	5- 10	7 3/4	- 1/8	-1.5
N	APPLIED DIG DATA SYS	13- 22	14 3/8	-1 1/4	-5.0
O	BEEHIVE INT'L	4- 7	6 3/8	0	0.0
A	BOLT,BERANEK & NEW	6- 14	13 1/2	+ 3/4	+5.8
N	BUNKER-RAMO	10- 20	17	- 1/4	-1.4
A	CALCOMP	3- 13	10 7/8	+ 3/8	+3.5
O	CAMBRIDGE MEMORIES	3- 9	6 5/8	- 1/8	-1.8
N	CENTRONICS DATA COMP	16- 36	33 1/2	+ 3/4	+2.2
O	COGNITRONICS	1- 4	2 1/4	+ 1/4	+12.5
O	COMPUTER COMMUN.	6- 12	10	0	0.0
O	COMPUTER CONSOLES	4- 10	8 3/4	+ 1/2	+6.0
A	COMPUTER EQUIPMENT	3- 6	5 1/8	- 1/4	-4.6
O	COMPUTER TRANSCEIVER	1- 3	3 1/8	0	0.0
O	COMTEN	4- 38	31 3/4	+ 3/4	+2.4
N	CONRAC CORP	19- 26	21 3/4	- 1/4	-1.1

EXCN		1978 RANGE (1)	CLOSE SEP 27 1978	WEEK NET CHNGE	WEEK PCT CHNGE
		PRICE			
O	DATA ACCESS SYSTEMS	3- 14	12	0	0.0
O	DATA 100	9- 20	19 1/4	0	0.0
A	DATA PRODUCTS CORP	15- 25	18 1/2	-1 1/8	-5.7
O	DATUM INC	2- 6	4 5/8	- 1/8	-2.6
O	DECISION DATA COMPUT	2- 6	4 3/8	0	0.0
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
A	DOCUMATION INC	6- 34	29	- 5/8	-2.1
O	DATARAM CORP	6- 31	26 1/2	+1	+3.9
N	ELECTRONIC M & M	4- 9	6 5/8	- 1/8	-1.8
O	FABRI-TEK	1- 2	1 3/8	-	-4.1
O	GENERAL COMPUTER SYS	1- 3	2 3/8	0	0.0
N	HAZELTINE CORP	10- 17	15	- 1/4	-1.6
N	HARRIS CORP	17- 36	34	+ 1/2	+1.4
O	INFOREX INC	6- 11	9 1/2	- 1/4	-2.5
O	INFORMATION INTL INC	8- 12	9 3/4	0	0.0
O	INTEL CORP	39- 62	52 1/2	-1	-1.8
A	LUNDY ELECTRONICS	4- 8	6 7/8	0	0.0
O	MSI DATA CORP	12- 19	14 5/8	-1 1/2	-9.3
N	MEMOREX	27- 59	48 1/2	-2 1/2	-4.9
N	MOHAWK DATA SCI	6- 15	11 3/8	- 1/4	-2.1
O	OMEX	2- 3	3 1/2	0	0.0
O	PENRIL CORP	5- 12	10	0	0.0
N	PERTEC CORP	9- 17	14 3/4	- 1/4	-1.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 1/2	0	0.0
O	RECOGNITION EQUIP	7- 13	10 7/8	- 1/2	-4.3
O	SCAN DATA	1- 5	3	- 1/2	-14.2
N	STORAGE TECHNOLOGY	19- 46	31	-1 3/8	-4.2
O	T BAR INC	11- 20	18 1/2	- 1/4	-1.3
O	TALLY CORP.	4- 9	7 5/8	- 1/8	-1.6
A	TEC INC	6- 13	11	+ 3/4	+7.3
N	TEKTRONIX INC	33- 50	46 1/2	- 1/4	-0.5
N	TELEX	3- 9	7 1/2	+ 1/4	+3.4
O	TESDATA SYSTEMS CP	13- 23	15 1/2	-4 1/2	-22.5
O	WILTEK INC	1- 1	7/8	0	0.0
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS PRODS	6- 11	9 3/4	- 1/8	-1.2
O	BALTIMORE BUS FORMS	2- 5	2 1/2	0	0.0
A	BARRY WRIGHT	14- 30	26 1/4	+ 1/2	+1.9
O	CYBERNATICS INC	1- 1	1	- 1/4	-20.0
O	DUPLEX PRODUCTS INC	18- 30	26 1/4	-1	-3.6
N	ENNIS BUS. FORMS	8- 17	12 7/8	-1 1/8	-8.0
N	3M COMPANY	43- 66	58 5/8	-1 3/8	-2.2
O	MOORE CORP LTD	26- 34	30	- 1/4	-0.8
N	NASHUA CORP	18- 37	31 3/4	+1 3/4	+5.8
O	STANDARD REGISTER	20- 27	24 3/4	+ 1/2	+2.0
A	TAB PRODUCTS CO	9- 16	14 1/8	- 1/8	-0.8
N	UARCO	19- 28	25 5/8	+ 1/2	+1.9
A	WABASH MAGNETICS	10- 22	19 1/4	+ 1/4	+1.3
N	WALLACE BUS FORMS	18- 33	28 1/4	- 3/4	-2.5

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NEWSPAPER

M Takes Distributed Processing Plunge

oftware Unbundled • 8100 Features 64K Chip

By E. Drake Lundell Jr.
CW Staff

WHITE PLAINS, N.Y. — IBM completely unbundled its operating system software from the price of hardware with the announcement of the 8100 information system here last week.

Instead of supplying operating systems with the processor, as has been the IBM tradition, the two operating systems for the 8100 carry price tags. All of the utility software is also priced separately.

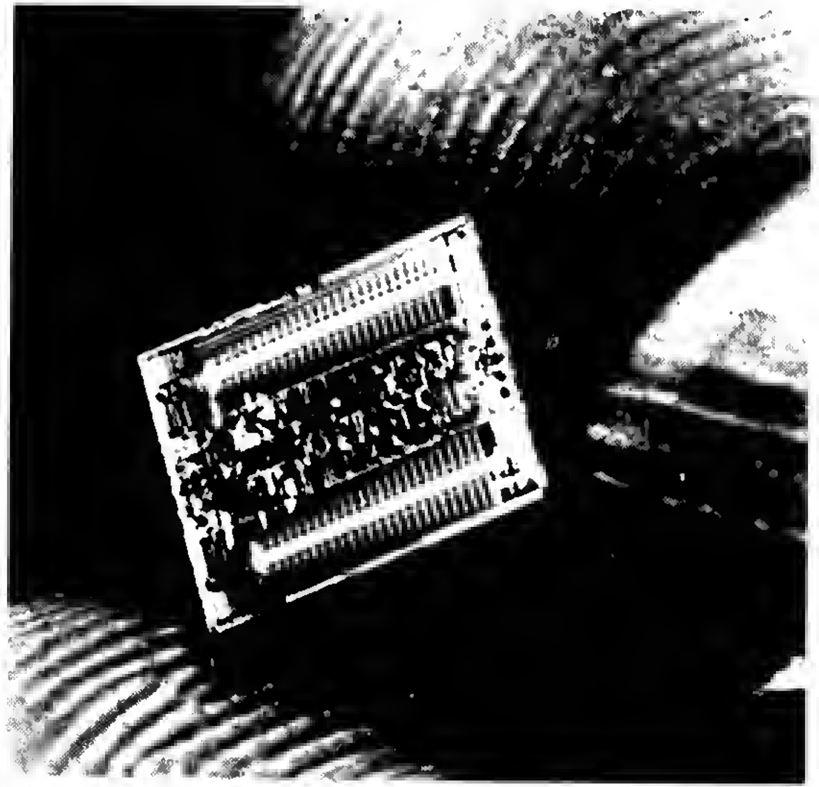
In addition to the pricing scheme, the software also features a programming aid that uses English language statements to lead operators through the creation of application programs, then automatically translates the operator's instructions into Cobol, IBM said.

While the systems are incapable of running IBM 370 applications, the operating systems do accommodate programs developed for the 3790 clustered terminal communications system.

The Distributed Processing Programming Executive (DPPX) can be used on an 8100 running either in stand-alone mode or as part of a distributed processing system. The second operating system introduced, the Distributed Processing Control Executive (DPCX), can be used only in networks that are tightly controlled by a host 370 mainframe.

IBM has offered completely unbundled operating systems only on one other product — the Series/1 from its General Systems Division, which is sold primarily in the stripped-down

(Continued on Page 4)



This tiny 64K-bit chip — the densest IBM has ever produced — is the heart of the 8100 information system announced last week. See stury on Page 4.

WHITE PLAINS, N.Y. — IBM jumped head first into distributed processing last week with the announcement of the 8100, a system that features new 64K-bit chip memory technology and aggressive pricing but won't be available for at least a year.

The system is one of the first from IBM to come completely unbundled, meaning users may be paying almost as much for software as for hardware.

For example, while the smallest 8100 processor with storage and disk leases for as little as $780/mo, a full complement of operating system software for a processor could run as high as $850/mo on license.

In other pricing actions, the use of the 64K-bit memory chips has allowed IBM to reduce the price of a 256K-byte memory increment to $4,500, while it remains at about $27,500 for the 370 and Series 30 computers.

While the 8100 is in many ways a replacement for the firm's 3790 clustered terminal system, it is in reality much more than that. The system, which will be sold by the firm's Data Processing Division here, can be used as a stand-alone processor or linked with IBM 370s or other 8100s as part of "a cooperative network processing plan," which seems to be IBM's buzzword for distributed data processing.

In either mode of operation, IBM claimed "portions" of the system can be installed by users "with a set of easy-to-follow directions — in much the same way as a basic household stereo system might be set up." Programs are loaded from diskettes.

While the 8100 operating as a stand-alone processor cannot run 370 programs, when linked to a 370 in a network it can access central computer program libraries, data files and diagnostic services and use the 370's power for peak load processing, IBM said. In addition, the host can pass computing jobs to the 8100s in the network to balance central site loads.

The 8100s can communicate with each other or with the host CPU at

(Continued on Page 4)

Itel Adds Programmer Workstation

By Don Leavitt
CW Staff

NEW YORK — Taking a page from the book on data entry systems, Itel Corp. has introduced a remote program development system consisting of both hardware and software that appears to free DP professionals from the physical problems associated with coding work.

Developed by Softlab GmbH of Munich following a German government-funded study on the things needed to improve programmer productivity, the Maestro distributed programming system enables the programmer, as well as the systems analyst and program designer, to work at a CRT, an Itel spokesman said at a press conference here last week.

This eliminates reams of undisciplined design documentation, as well as all coding sheets and punched cards, most program listings and virtually all the handwritten notes that so typically are generated by project leaders and programmers alike, he explained.

Maestro is built around Four-Phase Systems, Inc. hardware and is said to support all phases of the program development cycle from problem definition and program planning through documentation and coding.

Control and evaluation of program compilation and testing on a mainframe — whether from IBM, Itel Corp., Univac, Siemens or some other vendor — linked to a Maestro processor are also components of the system, the spokesman added.

There is nothing within the Maestro logic to prevent its use with any programming language, except perhaps one such as APL, which has special characters.

Itel specifically noted that the system supports development of programs in Cobol, PL/I, Fortran or Algol, although compilation and testing are

(Continued on Page 6)

Britons Fearful of DP

By Rex Malik
Special to CW

LONDON — Two-thirds of Britain's employed labor force believes computers are more likely to put people out of work rather than create more jobs.

That is among the results of the first survey ever conducted on British attitudes about computers, work and employment. It was also the first nationally representative survey ever carried out in Europe on the employment consequences of computing.

The survey was made by National Opinion Polls Ltd. as a contribution to a wide-ranging discussion now going on in the UK on technology — particularly the microprocessor — and employment. This discussion has involved government, including the Prime Minister, the trade union congress, the government's "think tank" — the Central Policy Review Staff — and the media.

DP's employment consequences have been a subject of perennial interest since Norbert Wiener's *Cybernetics* was published in 1948. This round of discussion was sparked by a BBC "Horizon" program, a 50-minute film shown in April called "Now the Chips are Down."

(Continued on Page 8)

IN DEPTH IN DEPTH

If you've been dividing by nine to see whether a transposition error has been made, Irwin Kraus has an enhanced method that he believes offers attractive time and labor savings. See 'Locating Transposition Errors' beginning on Page 13.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Cincom 'Software of the '80s' Combines 'Total,' Inquiry and Retrieval Packages

By Don Leavitt
CW Staff

CINCINNATI — An enhanced and integrated, although apparently still modular, package of three current products was introduced last week by Cincom Systems, Inc. as "the software of the '80s."

The Total Information System (TIS) blends and extends the capabilities of the Total data base management system with the T-Ask inquiry facility and the Socrates batch-oriented retrieval package, which work with current versions of Total.

TIS also includes an interface to Cincom's Environ/1 teleprocessing monitor and to the user's choice of host languages for application programs, as does Total. But Total is not the central piece of TIS; a full-blown data directory — not just a data dictionary — drives the system, according to Cincom spokesmen.

The directory not only defines all the data elements in the system but does so many times over, providing a Finite Logical View (FLV) of the data available to each user. The term "subschema" was used synonymously with FLV as Cincom described this feature; it clearly is comparable to Codasyl's concept of the subschema.

'End-User Friendly'

The vendor characterized TIS as an end-user-friendly system, including both the DP novice and the professional programmer in the "end user" category. It was also described as a system that is machine-independent, even though TIS Release 1 — due in the second quarter 1979 — will be IBM 370-oriented.

In addition to data base management and communications management, linking to IBM's CICS and ultimately other monitors as well as Environ/1, TIS features both retrieval management — on-line and batch — and update management. FLVs can thus be maintained independent of data base structure or data location, according to Cincom.

The user-friendly nature of the TIS on-line query facility, "showing many of the characteristics of artificial intelligence," is illustrated, a spokesman claimed, by the "free-form natural language" instruction "Print Customer, Order and Quantity Times Cost if Zipcode is between 90000 and 99999 and When Finished Print Total and Average of Quantity Times Cost."

The system will prompt the user in the preparation of a request, questioning, for example, references to data outside the user's FLV or key words that are misspelled, the spokesman said.

Once completed, a request may be stored for subsequent reuse. Requests destined for such reuse may include parameters to be specified at runtime so reports can be customized without having to be re-created each time they are used, he continued.

Although the batch-oriented query facility was described as a subset of the on-line offering, it includes a sort facility that is not part of the interactive mode facility.

Both the on-line and batch query facilities include the means of equating a single word or phrase to a much longer or more complex phrase so requests may be shorter and less prone to the errors that might crop up as long expressions are retyped.

Task-Level Recovery

With its ability to support multiple concurrent users running in both online and batch mode, the data base management portion of TIS has been "heavily rewritten" to provide task-level recovery in case of problems on the system, the spokesman pointed out.

As long as a problem can be isolated to the logic handling a single task, it will be; other work can continue unimpeded by the problem, he said.

While TIS Release 1 will support only the network data structures supported over the years by Total, backing for other structures — hierarchies and inverted lists, for example — will "almost inevitably" be available as TIS evolves, another spokesman noted.

That makes TIS an alternative for users of other data base management systems who see its range of facilities as more attractive than what they are now using, he acknowledged.

Release 1 will include directory management, both batch and on-line; data base management with task-level recovery; and both on-line and batch retrieval management. The purchase price of the package is expected to range from $120,000 to $150,000, depending on the type of installation.

Most users would be expected to rent it, the company said, but declined to provide monthly rental prices.

For purposes of comparision, however, DOS Total/Logging sells for $43,000 and rents for $1,025/mo. OS Total/Logging sells for $54,000 and rents for $1,300/mo.

Cincom Systems is at 2300 Montana Ave., Cincinnati, Ohio 45211.

Correction

In *Computerworld*'s coverage of the Intergovernmental Conference on Strategies and Policies in Informatics (Spin) [CW, Sept. 4, 11] the term "informatics" appeared several times. Our attention has been called to the fact that "Informatics" is the registered trademark of Informatics, Inc. of Sherman Oaks, Calif. The trademark is used to identify the goods and services of that company.

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Dr. JEKYLL

What do you do if your IBM sort starts turning into Mr. Hyde?

(Call us at the first sight of fangs!)

(201) 568-9700.

Get your act together with a SyncSort benchmark.

We think you'd better know that some OS/VS sort programs out there are leading *pretty colorful* double lives.

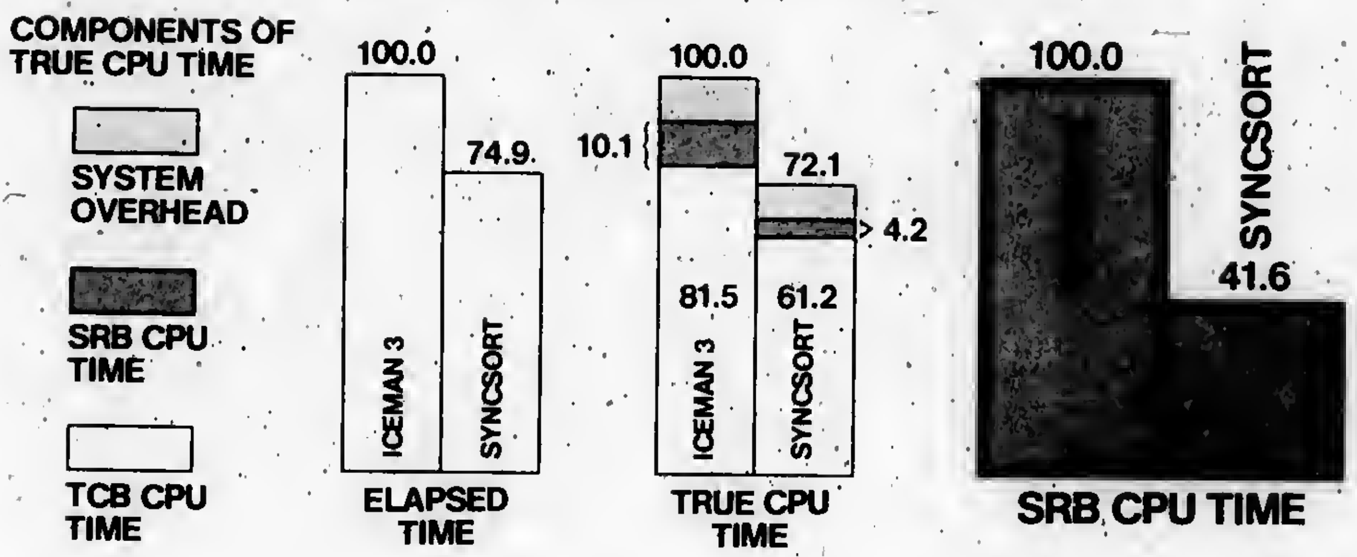
At first glance these Good Time Charlies look respectable enough. They're scions of that Grand Old Hardware Family. And under "normal conditions" — when did you last see any? —these programs look okay.

But then the data-processing climate changes. The sorting moon gets full, and the multi-programming jobs begin sending out their urgent messages on the jungle drums.

And the next thing you know your respectable sort program is out there committing atrocities — against your MVS resources and your non-sorting jobs in the mix.

What do you do if you think you've got a Jekyll/Hyde problem? Call us and we'll arrange a sorting survey. It's designed to tell you more about sorting — and your sort programs — than you ever knew.

The critical step is a benchmark that compares SyncSort's performance with that of your other sort(s). If you happen to be using the Computer Giant's 5740-SM1, Release 3, you'll see an eye-opening difference in resource utilization. On average it will look like this:



Incidentally, those charts on the right are particularly worth noting. They show the considerable difference in "locked-up" SRB Time between their sort and ours.

As you probably know, SRB Time is that component of True CPU Time when no messages can get through to the CPU. The more SRB Time in a sort, the greater the evil impact on other, non-sorting jobs in the mix.

It's a sure indicator of possible sort kinkiness. And the quickest way we know to spot Mr. Hyde in a crowd.

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IBM Unbundles Software

(Continued from Page 1)

minicomputer market.

The firm's Data Processing Division, which is marketing the 8100, previously offered certain parts of operating systems — such as the System Extensions to MVS — for a separate charge, but never an entire operating system.

IBM has also established a two-tiered licensing structure for the operating systems. There is a basic charge for the first use of an operating system or program product; if the same program is to be run on several processors, each subsequent use is eligible for the Distributed Systems Licensing Option (DSLO), which carries a lower monthly charge.

The DPPX — available for a license fee of $150/mo — provides the system's basic ability to perform network and stand-alone processing, including application program development in Cobol, Fortran and Assembler, IBM said.

For specific functions, DPPX works with a number of other IBM program products for the 8100, IBM said. The Data Base and Transaction Management System, for example, is similar to the Customer Information Control System/Virtual Storage (CICS/VS) used on 370s, IBM said, so local data bases can be created in accordance with central procedures.

The program manages transactions and data files in the system, IBM said, providing a number of users with simultaneous access to information.

The basic system costs $90/mo and the DSLO carries a tag of $68/mo.

The Host Command Facility runs on a 370 host when the 8100 is hooked up in a distributed network. It allows the central site staff to check, operate or program any 8100 in the network. The Host Command Facility is available on a basic license of $85/mo.

On the other side, a 3270 Data Stream Compatibility feature provides pass-through capability, permitting IBM 3270 and 8775 terminals attached to an 8100 to reach programs and applications in the 370 to which the 8100 is linked. It costs $15/mo for the basic package and $11/mo on DSLO.

The Development Management System is the program aid that translates English language statements into Cobol. This will allow people without DP backgrounds to create their own programs, IBM said. The basic charge is $85/mo and the DSLO is $64/mo.

In addition, DPPX/Cobol, DPPX/Fortran and DPPX/ASSM allow programs to be compiled and run in Cobol, Fortran and Assembler, respectively, IBM said.

The DPPX/Cobol compiler costs $80/mo for the basic unit and $60/mo under DSLO; the Cobol runtime library costs $15/mo and $11/mo respectively.

The Fortran Compiler carries a basic price tag of $60/mo and the DSLO is $45/mo, while its runtime library costs $30/mo and $23/mo, respectively. DPPX/ASSM costs $40/mo for the first copy and $30/mo for others.

Another feature — the Distributed Presentation Services package — allows users to tailor 3270 or 8775 CRT screen formats, IBM said. The feature comes in two parts; the Interactive Map Definition package costs $65/mo for the first 8100 and $49/mo for DSLO, and the Format Management package costs $25/mo and $19/mo under the pricing schemes.

RJE Capability

In order to let the 8100 act like a remote job entry (RJE) terminal, IBM is offering a program product called DPPX/RJE. This program rents for $20/mo for the first use and $15/mo for subsequent uses.

A sort/merge package for the system will cost $20/mo for the first use and $15/mo for use on other processors.

Furthermore, an Executive Performance Tool is available, that permits users to monitor the performance of the 8100 processors and receive regular reports, IBM said. The monitor portion costs $35/mo and the reporter portion will run users $40/mo.

A parameter-driven table generation facility that allows 8100s to change, use and update programs and data bases in an organization's central data files is also available for $15/mo on the basio charge and for $11/mo under DSLO.

All of those program products work only with the DPPX, but in tightly controlled distributed networks users can use DPCX on the central 8100 or 370 site for a fee of $215/mo.

DPCX offers such users "improved processing speed" compared with present 3790-type installations, IBM said, as well as access to as much as 320M bytes of disk storage and the ability to use the IBM 8809 tape unit.

DPCX incorporates the functions of the 3790 system including the ability to be programmed from a central 370 site, IBM said, adding that all programs written for the 3790 will operate on a 8100 running DPCX.

On an 8100, DPCX permits the system to function as a remote batch terminal operated from the host system, performing batch printing and message exchange functions, IBM added.

The 8100 systems can be attached to host 370 processors operating under OS/VS1, OS/VS2 MVS or DOS/VS, IBM said.

First Use of 64K Chip

WHITE PLAINS, N.Y. — IBM's use of 64K-bit memory chips in the 8100 information system is believed to be the first system applications of such devices, industry sources indicated last week.

The maximum chip size used in presently available systems is 16K bits, they noted, even though some firms have announced plans to offer 32K devices.

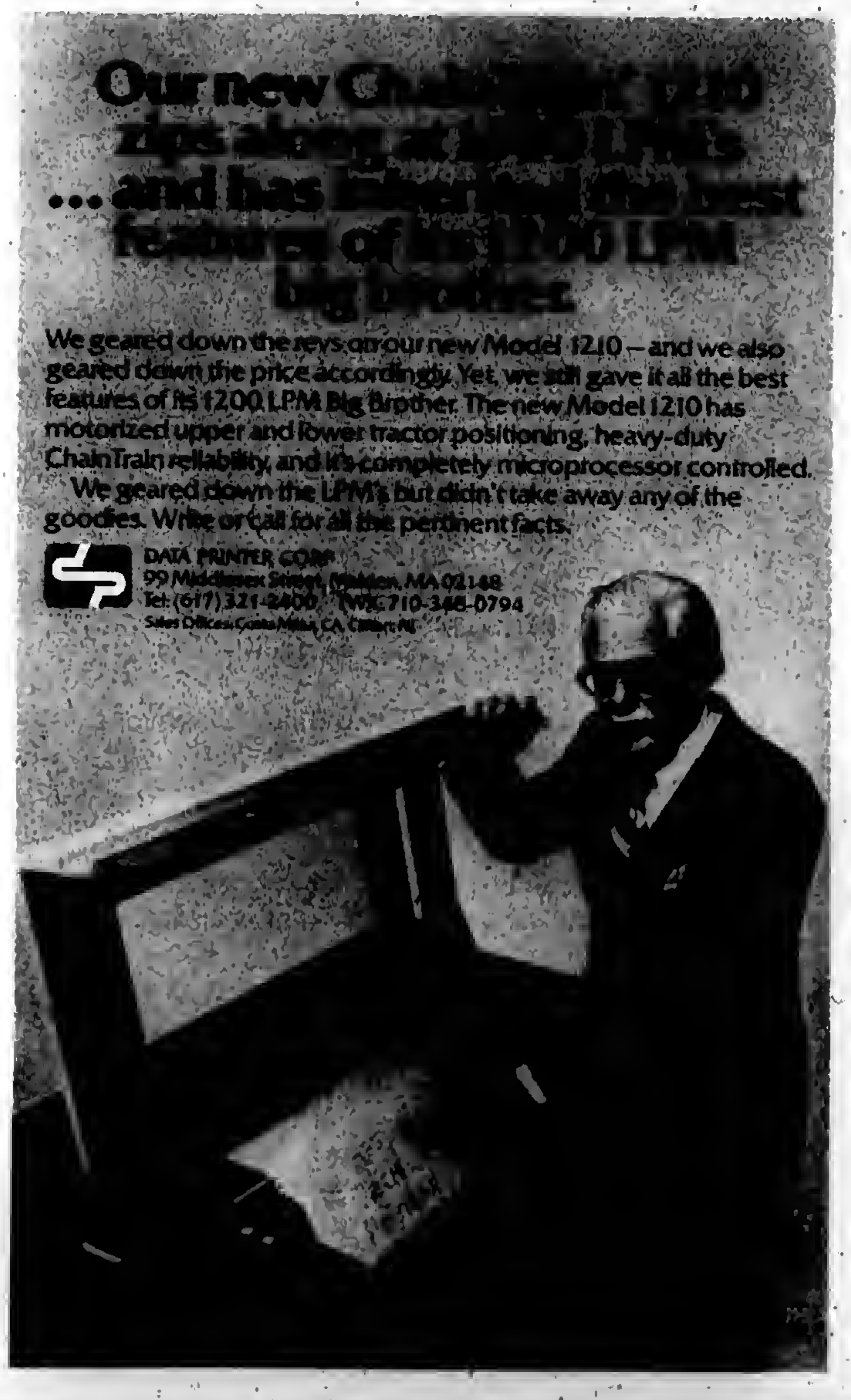
The only announcement to date of complex chips containing 64K bits has been from Texas Instruments, Inc., which announced plans to develop and deliver such a chip next year. The TI chips, however, have not yet been incorporated in any systems and will initially be available for testing only.

The IBM announcement, therefore, is seen as a major jump in technology, particularly since IBM claimed to be "in production" of larger chips at its Burlington, Vt., and Sindelfingen, Germany, plants.

The chip is made by a new IBM process for forming reliable metal gates that register the presence or absence of information, IBM said.

That process involves n-channel, metal gate FET technology which uses silicon nitride to enhance gate reliability, IBM added.

Furthermore, a conductive field shield is used in the chips to control surface leakage, IBM said.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Two IBM 8100 CPUs Debut

(Continued from Page 1)

speeds up to 56k bit/sec, IBM said.

The 8100 family features two processors — the 8130 and 8140, built-in disk storage, built-in communications capabilities, a new CRT terminal — the 8775 — and an electronic reel-to-reel tape unit, as well as two new printers.

The 8130 processor uses the 64K-bit memory chip technology developed by IBM and has an internal operating speed of 1,500 nsec. Processor storage ranges from 256K to 512K bytes in 256K-byte increments.

The 8140 processor uses older memory technology for an operating speed of 800 nsec; its storage ranges from 256K to 512K bytes in 128K-byte increments.

Both processors feature a 1M-byte diskette unit and can also handle a 256K-byte diskette for supplementary storage. Each comes with 64M bytes of built-in disk storage which features an access time of 27 msec and a data transfer rate of 1,031 byte/sec.

An 8130 processor with a 512K memory, 1M-byte diskette and a 64M-byte disk will sell for $29,940 and rent for $917/mo on a straight rental plan or as little as $780/mo on a two-year lease plan that was announced with the system. Memory is priced at $4,500 for a 256K-byte increment.

The 8140 processor with the same amount of main memory, diskette and disk storage will sell for $46,980, rent for $1,786/mo and lease for $1,520/mo on the two-year plan. Its memory is available at a price of $6,240 for an increment of 128K bytes.

An additional storage and communications unit, the 8101, can be used with the system to boost disk storage up to 320M bytes. Up to four of these units can reportedly be used with the 8140 — two with the 8130 — to accommodate additional CRTs, printers or magnetic tape units.

The 8101 with 64M bytes of storage will sell for $16,410, rent for $524/mo and lease for $446/mo.

All of the units will be delivered in the third quarter of 1979, IBM said.

The 8775 CRT terminal announced with the system uses a new IBM-developed 18K memory chip and features a tilted antireflective screen. It can display up to 3,440 characters, and the screen can be partitioned into eight separate work or display areas.

(Continued on Page 6)

First Commercial Use of SOS

Small Systems Bridge Gap in HP's Mid-Range

By Jeffry Beeler
CW Staff

NEW YORK — A wide gap in the middle of the Hewlett-Packard Co. business systems line was bridged last week when that minicomputer manufacturer announced two small systems that provide compressed packaging densities through what is said to be the first commercial application of silicon-on-sapphire (SOS) technology.

Designated the models 300 and 3000 Series 33, the two systems form a middle-of-the-line bridge between HP's low-end Model 250 system and its high-end Model 3000 Series III, formerly the only two members of its business systems family. With the latest additions to its product line, HP for the first time offers an unbroken series of small business systems ranging in price from $24,500 to about $250,000, according to a company spokesman. (See related story on Page 63.)

As part of the same product announcement, the firm also introduced the first two members of its 2620 series of character-mode CRT terminals — the 2621P, which provides an integral 120 char./sec thermal printer, and the 2621A, which lacks a hard-copy output capability.

HP sources credited the use of SOS technology with squeezing the capabilities of nine 3000 series processor boards occupying 700 sq in. into three chips totaling less than 1 sq in. The resulting compression allows the company to fit the 3000 Series 33 into a desk-sized space and to configure the 300 in a cabinet not much larger than a stand-alone terminal, the sources said.

SOS technology also reportedly permits the two systems to rival the performance of TTL-based equipment and to cut their power dissipation to 1W compared with 3W to 5W for hardware incorporating standard N-channel MOS technology.

Both the 300 and 3000 Series 33 use the same processor, which offers a 270-nsec machine cycle and a 500-nsec memory cycle, the spokesmen explained. The former system's CPU, however, is microprogrammed to implement HP's virtual memory Amigo 300 operating system, while the latter system is microcoded to implement MPE III, the same multiprogramming executive operating system used with the firm's 3000 Series II and III systems.

HP spokesmen characterized the Series 33 as the LSI version of the company's 3000 product line and said the system provides half the processing power of the top-of-the-line Series III.

In System/34's Class

Positioned in roughly the same product class as the IBM System/34, the Series 33 supports a minimum of 256K bytes of error-correcting memory expandable to 1M byte — the same main memory capacity as the 300, HP sources said.

Both systems support any member of HP's 2640 terminal series as well as either version of the recently introduced 2621. The 300 accommodates up to 16 of these terminals, while the Series 33 supports up to 32, with a practical limit of 15 to 20, the company officials noted.

A basic HP 300 and Series 33 configuration incorporates a 12M-byte and 20M-byte disk unit, respectively, as well as a 1M-byte floppy disk unit. Optional mass storage models available with both systems include the 20M-byte HP 7906, 50M-byte HP 7920 and 120M-byte HP 7925 removable-pack disk units.

The HP 300 accommodates any two of these disk options for a total mass storage capacity of 260M bytes, while the Series 33 supports up to eight 7925s for a maximum capacity of 960M bytes.

In addition, the Series 33 operates with HP's 1,600 bit/in. 7970E tape unit.

Typical applications for the Series 33 include order entry, inventory-status checking and materials planning, while the HP 300 typically serves either as a dedicated control station in the inventory control and payroll departments of large companies or as the central business system in small firms, an HP official explained.

Although both systems accommodate Basic and RPG-II, the Series 33 also supports Cobol, Fortran and SPL. Other software features available with the latest HP 3000 member include the Image/3000 data base management system and the View/3000 data entry package.

The HP 300, meanwhile, provides software tools like the Image/300 data base management system and development aids like text editor, sort/merge and Help.

Among the HP 300's other hardware features is an integrated CRT screen with up to 32 display windows, each of which can attach to a data file and scroll horizontally or vertically to accommodate entries or changes, the spokesman said. One window labels a column of eight software keys that allow users to select operating system functions or application menus.

Although neither the HP 300 nor the 3000 Series 33 at present provide synchronous communications capabilities

(Continued on Page 6)

DOS LEAPS AHEAD OF OS THANKS TO SPACE/MANAGER

Well, almost

At last, DOS/VS users can keep the low core, low overhead and high efficiency of DOS/VS while enjoying the powerful capabilities of OS file and space management.

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☐ **Expanded Capability** — An automatically maintained total-system catalog, comprehensive activity reports, automatic secondary space allocations, are just some of the system improvements provided by SPACE/MANAGER.

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IBM 8100 Makes Debut

(Continued from Page 4)

The 8775 with a 2,560-char. screen costs $3,645 and rents for $95/mo or $81/mo on a two year lease plan.

The 8809 tape unit does away with vacuum columns to maintain tape tension, using electronic sensors which constantly monitor and adjust the tension of the tape. The unit features 1,600 bit/in. recording for compatibility with other IBM tape systems, the firm said, adding that data transfer rates on the unit range from 20K to 160K byte/sec.

This unit will sell for $10,440 and rent for $341/mo or $290/mo on a two-year lease.

The printers for the system are the 3289 Model 3, which can produce up to 400 line/min and the 3287, which comes in 90- and 120 char./sec models.

HP Adds Mid-Range Units

(Continued from Page 5)

like networking, remote job entry or multipoint terminal support, HP plans to add these features to both systems in the coming months, the spokesmen said. The 300 and Series 33 also currently lack a library of applications software as well as upward hardware expandability with the other members of HP's business sytems line, the spokesmen conceded.

Turning their attention to the two members of HP's 2620 terminal series, the sources credited the 4K-byte units with storing 48 lines and using a 9 by 15 dot matrix cell to display up to 24 lines with as many as 80 char./line. Both the 2621A and 2621P incorporate 12-in. diagonal displays, provide 128 Ascii character sets and transmit 110 bit/sec to 2,400 bit/sec.

A basic HP 300 configuration consisting of a 256K-byte CPU, 1M-byte floppy disk unit, 12M-byte fixed disk unit, one language and an integrated display costs $36,500. A minimum 3000 Series 33 with a 256K-byte processor, 1M-byte floppy disk unit, 20M-byte fixed system disk unit, system/-maintenance console and desk enclosure costs $70,000.

The 2621A and 2621P, meanwhile, sell for $1,450 and $2,550, respectively. Deliveries of the HP 300 will begin in 14 weeks; shipments of the 3000 Series 33, in January, and deliveries of the two character-mode terminals, in eight weeks.

HP is located at 1501 Page Mill Road; Palo Alto, Calif. 94304.

Programming Work Aided

(Continued from Page 1)

"obviously" dependent on the availability of those languages on the user's mainframe.

Unlike some of the terminal-based or communications-oriented systems already on the U.S. market, Maestro utilizes its processor's disk storage and local intelligence to support most of the facilities needed by programmers.

Nassi-Schneiderman Charts

The version-by-version archiving of programs for review or quick reinstatement has been matched by other systems, but Maestro's support for the generation of Nassi-Schneiderman charts, to make sure the program designs are complete and logical, appears to be a breakthrough.

An "electronic paper clip" or mark enables a programmer to identify lines of code to which he wants to return and an associated function key allows him to move from mark to mark, forward or backward, as he reviews or reworks the code, the spokesman added.

Reflecting the common practice of programmers working on several problems concurrently, Maestro provides each user with up to nine "bins" of disk storage, each of which can be brought to the CRT screen on command so that work can begin again right where it left off.

He also noted that portions of code or documentation developed by one Maestro user can be copied into another user's program, if appropriate, to avoid "reinventing the wheel." Beyond that, Maestro supports an electronic messaging system so that project leaders and programmers can immediately share ideas or news of specification changes.

To avoid the needless repetition of commonly used coding — the Environment Division in a Cobol program, for example — Maestro provides a procedure language under which code and function key use can be defined once, then invoked any time it is required, by keying in its name and any runtime parameters, he continued.

Maestro enables the user to scroll up and down through work-in-progress and, when something of interest appears, to scroll sideways as well in order to see all of a 132-column listing, for example, even though the CRT screen normally accommodates only 80 characters horizontally.

The remote job entry implementation of Maestro is expected to be ready for delivery to U.S. users by the end of the month. A version supporting interactive compilations and testing under IBM's CMS or TSO "should be ready in the second quarter of 1979," the spokesman estimated.

The minimum Maestro configuration will include a processor, disk subsystem, line printer, tape drive and four terminals. It will cost $188,000 and will be expandable at $3,000/terminal until it reaches its current maximum of 10 terminals per processor for $206,000.

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Professors' Study Indicates

Team Approach May Cut Programmer Output

By Nancy French
CW Staff

The chief programmer team concept, which fragments the tasks involved in systems analysis and programming and forces greater social interaction among those working on a project, could actually reduce rather than increase productivity.

The reason: both fragmentation and forced interaction work against the aspects of DP jobs that satisfy and motivate DP professionals.

This is one of the implications of a study by Daniel Couger, professor of computer and management science at the University of Colorado's College of Business, and Robert A. Zawacki, an associate professor of management and organizational behavior at the university.

The study, which Couger described briefly at this year's National Computer Conference [CW, June 13] was published in part in the September issue of *Datamation* magazine.

According to Couger and Zawacki's findings, DP professionals rate their need for social interaction lower than do other professionals and show a greater need for "personal growth" — or learning or developing beyond their current level. With these general characteristics, they "are not actively seeking a 'team experience" and in most cases would rather work alone or work with others only for short periods of time.

Relatively Satisfied

The study also found that DP professionals in general rank their jobs as relatively satisfying. This is because the highly motivating atmosphere in the DP environment dovetails nicely with the DP professionals' unusually high need for personal growth. The classical descriptions of programming and systems analyst positions, then, are "a good match" for the individuals who fill them, the study found.

But what about the chief programmer team concept? Will it reduce job satisfaction and productivity?

This approach resembles the efforts of "the industrial engineers of the 1940s who kept chipping away at each job on the auto assembly line until it was splintered into the ultimate level of specialization.

"We seem to be concentrating just as fervently on fragmenting the jobs of analysis and programming," and to achieve greater productivity and hence greater job satisfaction, such jobs "should be enlarged in scope rather than reduced," the authors said.

"If we devote equal time to the analysis of motivation and the ingredients of job satisfaction, this alone may increase productivity," the suggested.

What does this mean to the DP manager who has already implemented team approaches to programming?

The team approach will work, the authors said, if the "frequency" and duration of team meetings are controlled. They recommended, for example, that structured walkthroughs be limited to two hours.

Feedback Lacking

There is one area of human interaction, however, that DP professionals did not get enough of, according to the study, and that was supervisory feedback. This may be because their supervisors were once programmers and systems analysts themselves with "low social need." Perhaps these supervisors and managers should be getting additional training in supervisory techniques and working with people when they are promoted, the article suggested.

The study was based on a survey of 1,600 people in DP jobs, 600 of whom were programmers or analysts.

The researchers used a behaviorists' model developed by Greg R. Oldham of the University of Illinois and J. Richard Hackman of Yale University. This model has been used to collect data on other professionals, and its use allowed the two authors to compare the results to some kind of a norm, the article said.

The model identified five important job characteristics, or "core job dimensions." These included skill variety, task identity, task significance, autonomy and feedback. Skill variety, task identity and task significance lead to the first of three critical psychological states described as "experienced responsibility for outcomes of the work"; and feedback leads to "knowledge of the actual results of the work activities."

These psychological states are associated with "high internal work motivation," "high-quality work performance," "high satisfaction with the work" and "low absenteeism and turnover," the article said.

DP employees seem to experience the same level of meaningfulness in their jobs as other professionals do, but have "lower perceptions of the degree of responsibility and knowledge of results," the authors found. Specifically, all professionals, including DPers, said they get most of their feedback from their jobs themselves and scored this element around five on a scale of one to seven. However, DP professionals scored feedback from supervisors at 3.97, compared with 4.21 for other professionals.

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Britons Believe DP Means Unemployment

(Continued from Page 1)

The film argued that the microprocessor will destroy employment as it is now known and that without substantial change, the UK could by the middle 1980s face unemployment three to four times higher than the 6% of today.

The results of the survey on computers and employment was presented to a UK press symposium organized by Univac at its international executive center at St. Paul de Vence, just outside Nice in Southern France. The symposium was attended by, among others, Michael Spicer, Conservative member of Parliament and a key figure in the opposition's development of policy for the industry, and by Reay Atkinson, formerly director of the UK goverment's Central Computer Agency which purchases and runs the government's DP power. Atkinson is now in charge of Computing and Microelectronic's support policies.

The survey, carried out with a nationally representative sample of 1,001 people in employment, showed that 25% expected computers to put "lots" of people out of work and 41% think they will put "some" people out of work.

The breakdown according to type of employment showed fears of computing are at their highest among the unskilled. For instance, where 16% of those in management expect computers to put "lots" of people out of work, 35% of unskilled workers expect the same consequence.

Only 16% of the sample — broken down into managerial, other white-collar, skilled and unskilled — expect computers to create more jobs. All groups indicated that even if computing were to create more employment, this would not be much more. "Create many more jobs" received percentage answers ranging between 2% and 4%, with an average of 3%.

However, when asked "Should we have more or fewer computers?", more people replied "Yes, we should have more" than those whoe wanted "fewer," by a score of 39% to 38%. Twenty-three percent replied they didn't know.

The questions for the survey conducted by National Opinion Polls Ltd. were developed by journalist Rex Malik.

Again there was a marked difference between the classes: 56% of managers said "more" while 17% said "fewer." Among unskilled workers, 24% said "more" and 48% said "fewer."

Here there was also a noticeable difference between the sexes, with 46% of men saying "more" and 36% "fewer" as opposed to 28% of women saying "more" and 43% saying "fewer."

Rampant Puritan Ethic

If the mix of technologies threatens employment as we now have it — the premise the symposium set out to discuss — then the UK's working population faces some severe challenges to its attiudes. The survey showed the Puritan ethic runs rampant in the UK, contrary to the attitudes many foreigners have of Britain's working population.

To the question "Do you enjoy the work you do a lot, a little or not at all?", 75% replied they enjoy it "a lot." The range was highest in the management group where 81% said they enjoy work a lot, and still at a remarkable high 66% among unskilled workers.

Only 1% of managers liked what they are doing "not all all," and that figure rose only to 8% among the unskilled.

Job satisfaction, however, was highest among other white-collar workers, with 83% liking their work "a lot." In view of the general expectation in the UK — expressed at conference after conference during the last year or two — that technology is now going to start biting into employment prospects in the office, the white-collar field, this does not auger well for the future of labor relations.

When respondents were asked "If you had the opportunity to give up work without loss of pay, would you do so?", 56% said "no" while 40% said "yes" — across all classes.

The subject was then presented another way. "If you could be paid the same for doing another job, would you want to continue the job you do, or would you like to do something else?" Here 65% said they would continue, while 33% would get other work, with a high of 40% among 15 to 24 year olds.

Retraining With Pay

Those surveyed were also asked, "Would you like to be retrained for another job (the retraining would be paid and you would not lose any money)?" Fifteen percent said they would like very much to be retrained, and 21% said they would "quite like" it.

However, 61% stated they would either "not like at all" or 'not really like" retraining even without any loss of money.

Nevertheless, as National Opinion Polls calculated from current national labor statistics, if one adds the two groups in favor, 7.5 million people would accept retraining provided they suffered no financial loss.

The British, it seems, are prepared to change their work habits in enough numbers to cushion the shock of change, if the financial conditions for their not fighting it can be created. As the survey showed, however, unemployment is the great British preoccupation.

To the question "Do you think the figure of 1.5 million unemployed is acceptable in our economic circumstances?", they came out 5-1 against its acceptability. The actual questions were "acceptable in our economic circumstances" or "unacceptable in any circumstances," 76% took the latter view.

Crux of Argument

At the heart of the argument over the impact of computers on employment has been the view that one either believes or does not believe that people are going to be an essential element within the conventional economy. If jobs cannot be found, then a means of income distribution must be found and the leisure society encouraged.

But do people want to leave work? "If you had the opportunity to give up work without loss of pay, would you do so?" was also asked; 40% said yes, 56% said no.

The no figures — a shock for those who believe the younger generation has lost the will to work — were at their highest among those 15 to 24 years old.

However, the notion of a society in which people could choose whether to work got short shrift. To the question "Do you think it would be a good thing for society if people didn't have to work to get money, but could choose to work or not?", the no's had it, 83% to 12%.

Nearly twice as many women said yes as did men — 16% to 9%.

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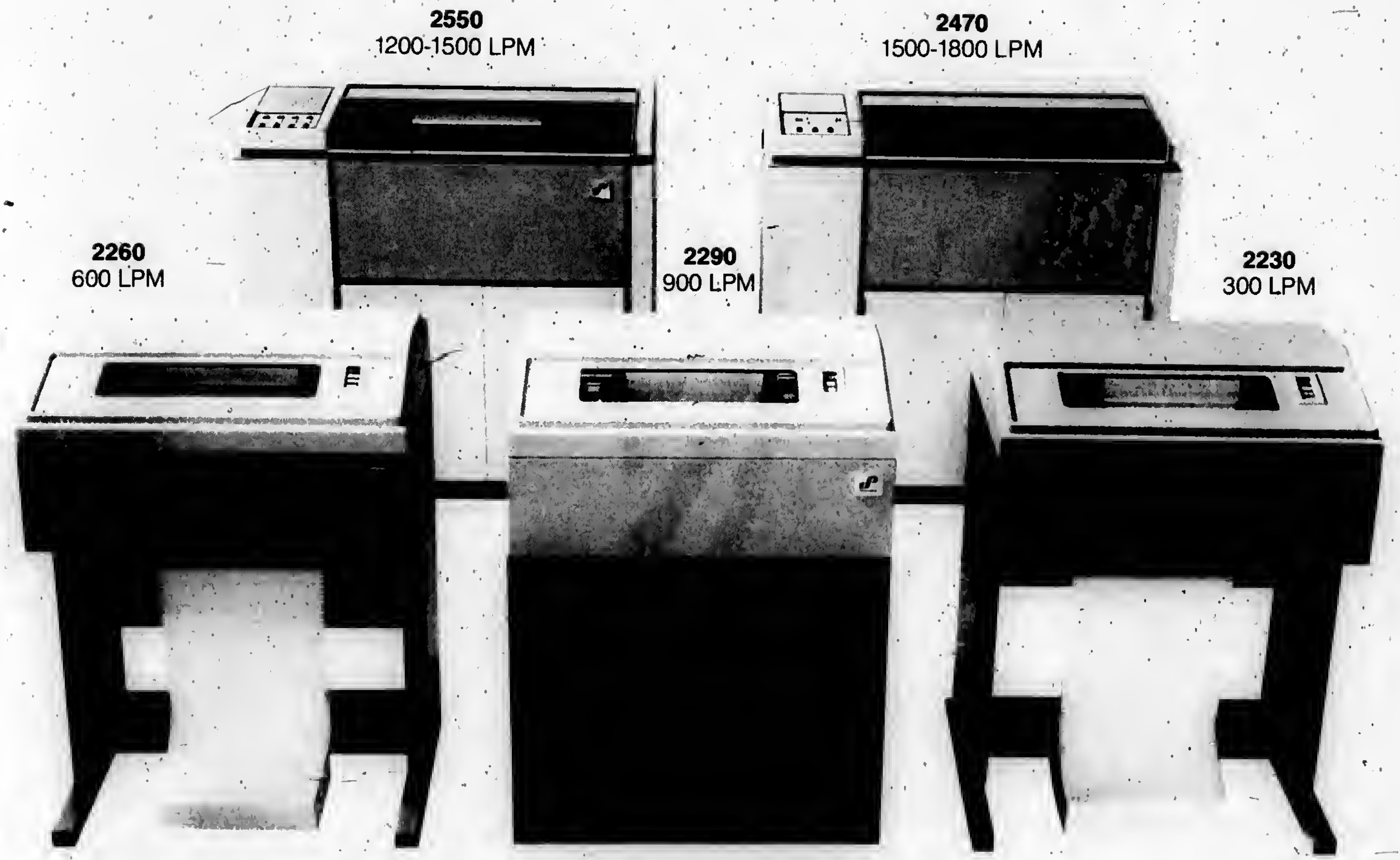

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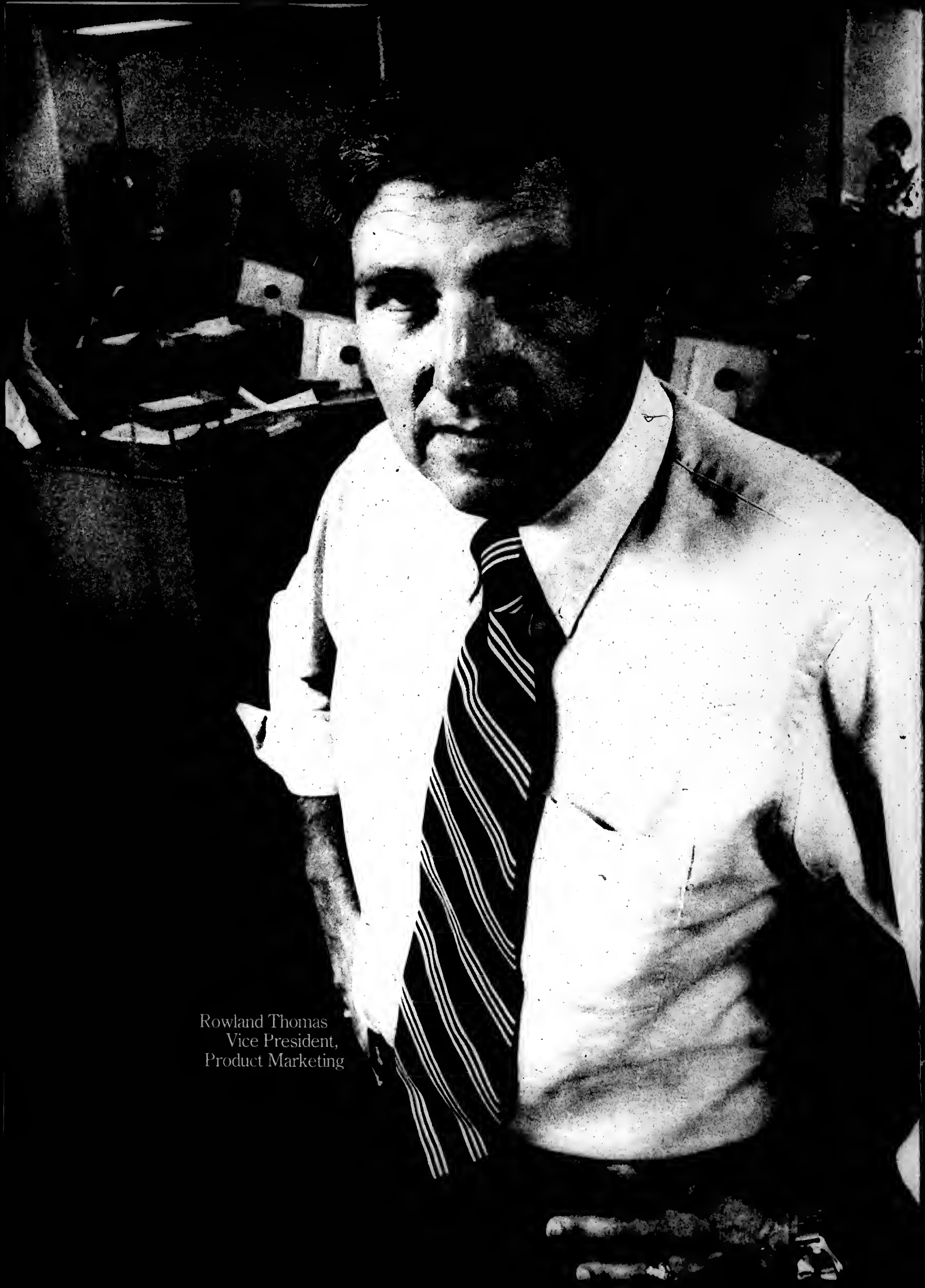

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System Computes Odds for Workable Marriage

By Ann Dooley
CW Staff

SALT LAKE CITY, Utah — Choosing a marriage partner is a decision that is rarely made rationally or logically, according to two sociology professors who developed a marriage analysis simulation system that puts a note of cold, hard logic into romance.

Called Matesim, the computer simulation is designed to help people analyze marriage decisions and values. Using Matesim, an individual can describe an ideal mate in terms of personal values and determine how closely one's intended measures up to that ideal, according to profes ors Gerald Smith and Jerry Debenham.

The simulation took nearly three years to develop and includes 108 categories for analyzing marriage. The system is programmed to ask the respondent a series of questions about his marital values and expectations, his general value system and his prospective partner's values.

Run on a Univac 1108, the simulation performs an analysis for each potential partner, notes the person's strengths and weaknesses, makes a prediction of the marriage's success, points out potential trouble spots resulting from divergent values and also notes how the respondent would have to change to improve the success potential, Smith explained.

The simulation records the respondent's marriage values and compares them with a set of idealized values that marriage counselors have determined lead to a successful marriage.

The professors have implemented the Matesim analysis in their classes at the University of Utah to show students how to think rationally about marriage and also to "turn them on to computers," according to Smith. As many as 100 males and 100 females can simultaneously indicate their values and their marriage expectations by using Digital Equipment Corp. Decwriter terminals located at the University.

Trying Out Marriage

Students can simulate marriage to classmates or to specific beaux to find out if a marriage might prove successful.

To describe themselves and what they want in a mate, the students choose from more than 1,000 different judgments in categories such as physical characteristics, personal habits, work and economic orientations, family expectations, mental orientations, sexuality, personality characteristics, personal preferences and social characteristics.

Questions about individual values cover physical attractiveness, television viewing habits, job mobility, child discipline, goals, ambitions, attitudes toward life, class association and self-confidence.

The system is programmed in APL and has a capacity of 250,000 bytes, according to Smith, who also noted that the program runs entirely in English and requires no user knowledge of computer languages.

The simulation is composed of more than 2,000 programming steps and — it is such a large program — APL is almost too small, Smith pointed out.

Once the candidate and the respondent's value information has been entered, the system compares and contrasts the two responses and also compares them to the marriage counselors' information. This source consists of the collective opinion of social workers and psychologists who looked at all the values from a professional viewpoint and decided what values were important to marriage.

The system also compares how a candidate differs from the respondent's ideal by determining the candidate's traits in each category and then subtracting the value the candidate assigned to the trait from the value the respondent assigned to the trait. The resulting number indicates how close the candidate is to the respondent's ideal mate in terms of values.

Similiarties and differences between value systems can also be compared by the system. It can indicate how the respondent should change priorities to experiment with alternative value orientations, Smith explained.

In addition, the system points to the most fulfilling and the most troublesome areas to expect in the marriage according to similarities and differences in hgih priority values.

Three Major Factors

The simulation results are derived from three major factors: values considered important in a marriage by counselors' standards, proximity of the partner to the respondent's ideal and closeness of the partner to the respondent's values. If the couple is in conflict in 50% of the areas, the marriage would not be determined successful, according to Smith.

Debenham and Smith have distributed the simulation program to several universities and nonprofit institutions while acting as consultants to the project.

In order for social and behavioral scientists to use the simulation concept, change routines were built into the program for modification to fit the user's needs.

Brigham Young University, for example, changed many of the questions relating to sexual values to questions about spiritual values since that institution felt the latter were more significant to its students, Smith noted.

Such changes can be implemented on an interactive computer terminal, he pointed out.

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Locating Transposition Erorrs

By Irwin Kraus

Tranposition errors, the interchange of two adjacent digits when transcribing a number, have been the bane of accountants, clerks and statisticians. A common method for detecting transposition errors has traditionally been taught in basic accounting courses. The method states that if a column of figures is out of balance and the amount of the error is evenly divisible by nine, one of the figures has probably suffered transposition.

At this point each figure must be verified, a process which is complicated by the mind's perverse tendency to perceive the incorrect figure as it should be and not as it is.

Mathematical analysis of the basic accountant's method has yielded some relationships which provide additional information about the figure containing the transposition error. The enhanced method identifies a subset of candidate figures, one of which will contain the error.

As will be shown, the subset comprises approximately 5.5% of the figure population, thereby drastically reducing the time required to locate and correct the error. Due to Murphy's Law, these errors most frequently occur under the severe time constraints of financial closings or quickly approaching project deadlines. Hence, the time and labor saving qualities of the enhanced method become quite attractive.

The method can be used manually, but is particularly suitable for computerization. A typical application would be a batch of transactions accompanied by a batch header containing a control total. If the amounts in the transactions do not balance to the control total and the difference is evenly divisible by nine, the transactions may be listed with the transposition error candidates flagged. From a population of 1,000 transactions, only about 5.5% or 55, would have to be examined.

The information provided by the enhanced method which permits error candidates to be recognized is:

- The position of the transposed digits within the figure.
- The arithmetic difference between the two transposed digits.

The arithmetic difference will range from -1 to -9 and 1 to 9. If the difference is zero, the digits are identical and the transposition has no effect. By locating which two-digit positions should be inspected and knowing the arithmetic difference of those two digits, the search for the error is considerably narrowed.

Control Total	Figures
$3,738.55	$ 651.32
	171.95
	18.28
	937.62
	1,952.18
	$3,731.35

Figure 1

Figures	Third - Second Digit
65132	1 - 3 = -2
17195	1 - 9 = -8
1828	8 - 2 = 6
93762	7 - 6 = 1
195218	2 - 1 = 1

Figure 2

An example at this point should clarify the process. First, the groundrules:

1. Digit positions will be counted from right to left.
2. Decimal points will be ignored. Treat the figures, totals and differences as whole numbers.

Given the control total and column of numbers shown in Figure 1, the method will be used to locate and correct a transposition error.

Step No. 1

Using the basic accountant's method, determine if the out-of-balance condition may be a transposition error. If the difference between the two totals is evenly divisible by nine, transposition is probably the culprit.

This may be stated:

$$(\text{Figure Total}) - (\text{Control Total}) = 9k$$

where k is a whole number.

$$\begin{aligned} 373135 - 373855 &= 9k \\ -720 &= 9k \\ -80 &= k \end{aligned}$$

Since k is a whole number, transposition is indicated and the procedure may continue.

Step No. 2

The value of k bears a clue as to which digit positions were transposed. This is based on the fact that any number may be represented as the sum of a series, such as:

$$9{,}238 = 9 \times 10^3 + 2 \times 10^2 + 3 \times 10^1 + 8 \times 10^0$$

If k is converted to this notation, it will be:

$$-80 = -8 \times 10^1$$

This signifies that the transposition error begins in the 10^1, or second, digit position. The other digit taking part in the transposition will be the next to the left: the 10^2, or third, position.

Step No. 3

Having located the digit positions in question, the digit difference must now be determined. The value of k also yields this: it is simply the mantissa portion of k as expressed in scientific notation, or -8. The column of figures may now be scanned for one whose third less second digit equals a negative 8. (See Figure 2).

The second figure, $171.95, fits the criteria. (Correct the transposition to $179.15 and see if the control and figure totals balance.) In a larger population of figures, other digit combinations may have also

(Continued on Page 14)

IN DEPTH

IN DEPTH

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               COBOL EXAMPLE - TRANSPOSITION ISOLATION

WORKING-STORAGE SECTION.

01   BATCH-HEADER-RECORD.
     05   CONTROL-TOTAL                                 PIC S9(7)V99.
     05   FILLER...
01   TRAN-RECORD.
     05   MISCELLANEOUS-TRAN-DATA...
     05   DETAIL-FIGURE                                 PIC S9(5)V99.
01   WORK-AREAS.
     05   DETAIL-TOTAL                                  PIC S9(7)V99.
     05   ERROR-AMOUNT                                  PIC S9(7)V99.
     05   REMOVE-DETAIL-SIGN                            PIC S9(5)V99.
     05   DIGIT-BREAKDOWN REDEFINES
               REMOVE-DETAIL-SIGN.
          10 DIGIT OCCURS 7 TIMES PIC S9.
     05   K                                             PIC S9(7).
     05   X-POS                                         PIC S9.
     05   Y-POS                                         PIC S9.
     05   END-OF-FILE                                   PIC XXX.
     05   TRANSPO-ERROR                                 PIC S9(7).
     05   DIGIT-DIFFERENCE                              PIC S9.

PROCEDURE DIVISION.

     Housekeeping

PROCESS-TRAN.

     Normal transaction processing

     ADD DETAIL-FIGURE TO DETAIL-TOTAL.
     •
     •
     •
END-OF-JOB.
     SUBTRACT CONTROL-TOTAL FROM DETAIL-TOTAL
          GIVING ERROR-AMOUNT.
     IF ERROR-AMOUNT NOT = ZERO
          DIVIDE ERROR-AMOUNT BY 9
               GIVING K, REMAINDER TRANSPO-ERROR
          IF TRANSPO-ERROR = ZERO
               PERFORM TRANSPOSITION-ERROR
          ELSE
               DISPLAY 'OUT OF BALANCE, NOT TRANSPO.'.
TRANSPOSITION-ERROR.
     CLOSE TRAN-FILE.
     OPEN INPUT TRAN-FILE.
     NOTE - CALCULATE Y DIGIT POSITION.
     PERFORM DIVIDE-K
          VARYING Y-POS FROM 1 BY 1
               UNTIL K IS LESS THAN 10.
     NOTE - CALCULATE X DIGIT POSITION.
     ADD 1, Y-POS GIVING X-POS.
     NOTE - AT THIS POINT, K IS EQUAL TO THE
          DIGIT DIFFERENCE BEING SOUGHT.
     PERFORM PASS-TRAN-FILE
          UNTIL END-OF-FILE = 'YES'.

PASS-TRAN-FILE.
     READ TRAN-FILE INTO TRAN-RECORD
          AT END MOVE 'YES' TO END-OF-FILE.
     IF END-OF-FILE NOT = 'YES'
          MOVE DETAIL-FIGURE TO REMOVE-DETAIL-SIGN
          SUBTRACT DIGIT (Y-POS) FROM DIGIT (X-POS)
               GIVING DIGIT-DIFFERENCE
          IF DIGIT-DIFFERENCE = K
               DISPLAY TRAN-RECORD, 'POSSIBLE TRANSP. ERROR'
          ELSE
               DISPLAY TRAN-RECORD.

DIVIDE-K.
     DIVIDE K BY 10.
```

Figure 3

(Continued from Page 13)

yielded a negative 8, but the search for the error will have been narrowed to a relatively small subset of figures.

A short excursion into the realm of probability will explain why the method identifies a subset of error candidates averaging 5.5% of the figure population.

Of the transposed digits, the first may range from 0 to 9, giving 10 states. The second may also range from 0 to 9, but if it is equal to the first, transposition would have no effect. The second digit, therefore, has nine states which, combined with the 10 states of the first, result in 90 possible digit combinations.

The arithmetic difference between the two digits ranges from -1 to -9 and 1 to 9, 18 possible values. Each value can be found in only a certain number of ways. For example, there are only three digit combinations which yield a difference of -7:

0 — 7
1 — 8
2 — 9

The number of ways that digit differences may be found range from one (for -9 and 9) to nine (for -1 and 1). The total of these possibilities is 90 different ways in which the 18 digit differences may be found. The average number of ways is, therefore, five (90/18).

Since any of the 18 differences from a transposition error have an equal probability of occurring, the probability of finding a figure which contains two digits yielding a specific difference is the average number of ways that a difference may be obtained divided by the total number of digit combinations:

5/90 = .055555

This means, that, on the average,

Irwin Kraus has been senior DP auditor at Blue Cross/Blue Shield of Kansas City, Mo., for about six months. Prior to that he was a programmer/-analyst.

Kraus, who is working on a bachelor's degree in finance, became a programmer when he joined the Marine Corps in October 1968.

5.5% of all figures will contain a digit combination which yields a specified difference.

A sample Cobol implementation of the method is shown in Figure 3. The position of the two transposed digits will be referred to as X and Y, respectively, X being the leftmost. The digit difference will be found by subtracting the Y digit from the X digit.

It should be noted that k could be simply converted to scientific notation, the mantissa yielding the digit difference and the exponent indicating the position. This example will, however, divide k repeatedly by 10 until k is less than 10. The number of divides required will be equal to the exponent and the residual k value will equal the mantissa had k been expressed in scientific notation.

For example, if k = 5,000, three divides are required before k is less than 10:

$$5000/10 = 500$$
$$500/10 = 50$$
$$50/10 = 5$$

The residual k value and the three divides signify that

$$5000 = 5 \times 10^3$$

When a transposition error has been made, the following statement is true:

(Erroneous Figure) - (Correct Figure) = 9k

Letting x and y represent the transposed digits at some position 10^{n+1} and 10n within the figure, this may be restated:

$$(x10^{n+1} + y10^n)-(y10^{n+1} + x10^n) = 9k \quad (1)$$

Simplifying:

$$(x10^{n+1} + x10^n)-(y10^{n+1} + y10^n) = 9k \quad (2)$$
$$x10^n (10-1) - y10^n (10-1) = 9k \quad (3)$$
$$9 x10^n - 9 y10^n = 9k \quad (4)$$
$$10^n (x-y) = k \quad (5)$$
$$x-y = \frac{k}{10^n} \quad (6)$$

This last expression allows the digit difference (x-y) to be found. The power of 10 required to make the statement true specifies the position of the transposed digits. That power of 10 may be obtained intuitively.

However, it may also be found by restating the expression:

$$10^n = \frac{k}{x-y} \quad (7)$$
$$n = \log^{10} \frac{k}{x-y} \quad (8)$$

Although this method requires the simultaneous solution of x-y and n, the procedure is simplified by the fact that if k were expressed in scientific notation, the mantissa is equal to x-y and the exponent is equal to n.

Lecht to Speak At Datapro Meet

DELRAN, N.J. — Charles P. Lecht, chairman and president of Advanced Computer Techniques Corp., will be the featured speaker at a series of workshops sponsored by Datapro Research Corp. on Nov. 30 at the Americana Hotel in New York.

Lecht will talk about white- and blue-collar information processing symbiosis on the third day of Datapro's national conference on "Information Technology and the Office." The conference begins Nov. 28.

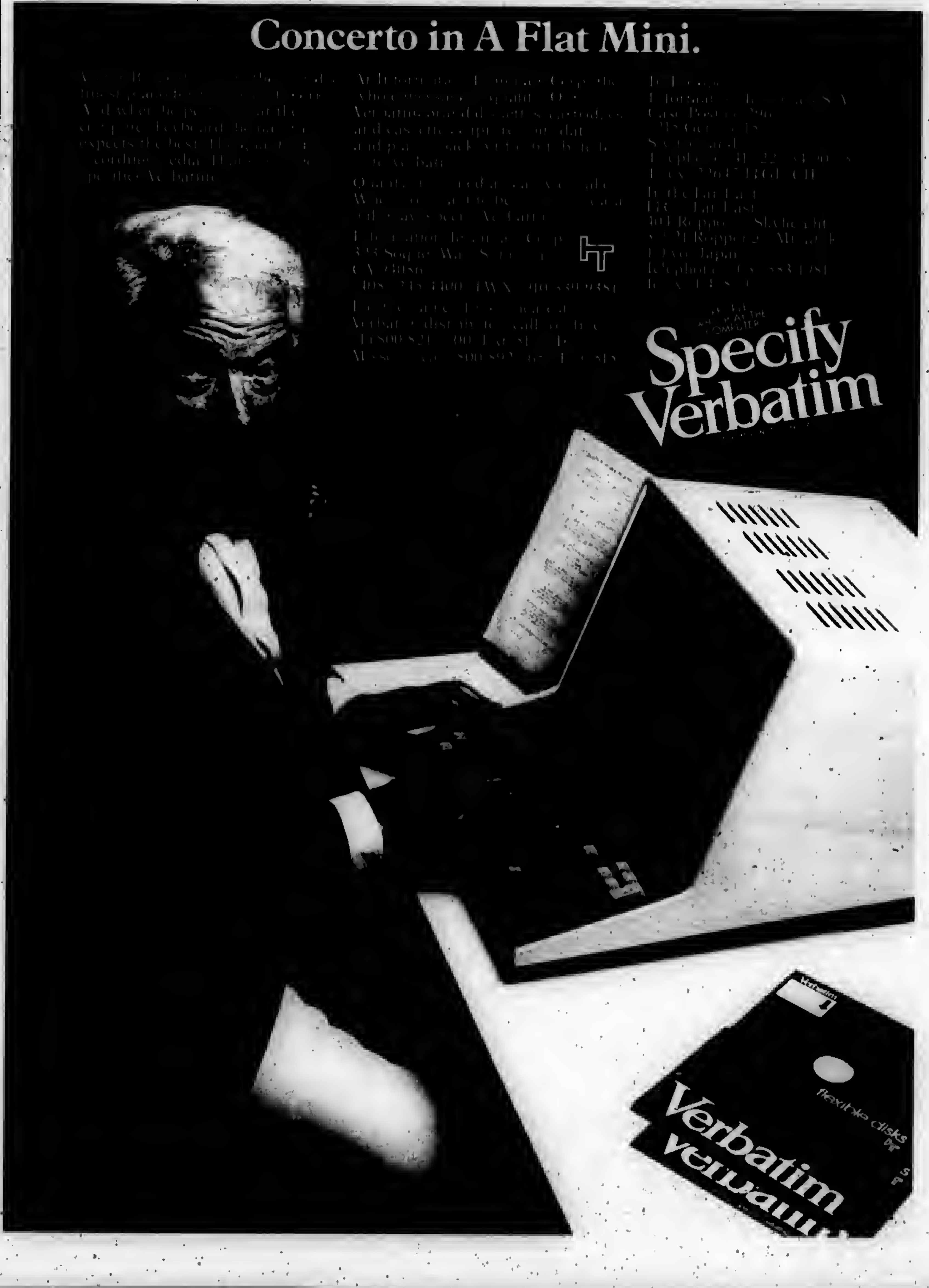
The speaker is author of *The Waves of Change; A Techno-Economic Analysis of the Data Processing Industry,* which was serialized in the pages of *Computerworld.*

Other Speakers

Other speakers will include Robert V. Head, assistant for ADP Technology for the U.S. Department of Agriculture; Dr. Robert M. Landau, president, Science Information Association: Amy D. Wohl, word processing editor for Datapro Research Corp.; Frank R. Heath, vice-president of management systems for Crouse-Hinds Co.; and Dr. William J. Wenker, chief of the WWMCCS Computer Performance Evaluation Office in the Department of Defense.

Registration costs $440 for Datapro subscribers and $485 for nonsubscribers before Oct. 28 and $490 and $540, respectively, after that date.

Additional information is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075



Citizen-Managed Utility Seen Avoiding '1984'

By Ronald A. Frank
CW Staff

KYOTO, Japan — A new type of computer utility — owned and managed by citizens — may avoid the threats now posed to individual privacy, according to Yoneji Masuda of the Japanese Institute for Information Society.

Speaking at a session dealing with the social aspects of computer communications at the recent International Conference on Computer Communication (ICCC '78), Masuda said only through the citizen-managed utility can the information society avoid the dangers of a controlled society.

CW at ICCC '78

Three basic types of information utilities will evolve, as Masuda sees it. These are business-managed, government-managed and citizen-managed.

The Business Utility

The business utility will operate with private capital and will be a for-profit organization. It will be similar to the commercial time-sharing networks now in operation, he predicted.

This type of utility will grow in the advanced, free countries. He pointed out, however, that private utilities would soon drop social welfare services that do not render profits.

The government information utility will be funded from the national budget, and the management goal will be to increase the general welfare of the people. This type of utility will draw revenue from both taxes and network users. The information processing and services of this utility will include all types of government statistics and government policy information.

Rates for this utility will be the same as for the business utility: an hourly charge for processing plus a basic fee to access the utility, Masuda noted.

The government-type of information utility will grow initially in the socialist countries where it will be characterized by low rates and determination to serve the public good, according to Masuda. The disadvantages of this type relate to the inefficiency of a bureaucratic organization and the threat of excessive government control. The latter area could affect individual rights, he remarked.

Most Novel Utility

The third and most novel utility will be citizen-managed, with capital raised by citizens. The management goal of this utility will be the voluntary creation and utilization of information by citizens.

The operations base will consist of citizen-raised maintenance funds, network usage fees and voluntary contributions. Rates charged for access to this citizen utility will be based on an individual's income, in addition to a standard network access charge, Masuda explained.

Difficulties associated with this concept include the inability to raise the necessary capital, the lack of highly trained specialists and inefficient management. Each citizen must have a high degree of civic awareness and motivation to contribute to such a computer communications offering, he added.

Despite the drawbacks, only with this type of utility can the dangers of a controlled society be avoided, Masuda believes. If the citizen management protects personal information and, if the network is used to improve private lives, then this type of offering will succeed.

The citizen-operated utility has the capability of improving the quality of social activity and maintaining the individual in a healthy, active state. These social benefits will be unlike any before, he explained.

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Pay Heed to Total System, Standards Makers Urged

By Ronald A. Frank
CW Staff

KYOTO, Japan — The trend in standards making today seems to be aimed at satisfying immediate needs without properly studying the total systems impact, according to Harold C. Folts, a senior engineer with the U.S. National Communications System.

Speaking at a session about network interfacing at the recent International Conference on Computer Communication (ICCC '78), Folts, a participant in various standards-making committees, said that "in the frenzy of developing interface standards for data communications applications, little attention has been given to the total perspective of the picture."

Among the issues that need immediate attention, Folts listed the relationships of the total spectrum of applications for which data terminal equipment can be used as well as the total range of telecommunications services that may be provided by public networks.

Folts charged that as a result of piecemeal approaches, the Consultative Committee on International Telegraph and Telephone (CCITT) is simply trying to satisfy immediate needs without considering the total systems impact.

A proliferation of standards seems to be emerging which may result in data terminal equipment and operating procedures becoming so complex that the user will lose the flexibility and economic benefit gained from having standards, Folts noted.

After reviewing the current status of various standards-making areas, Folts called for an "orderly evolution" into the future to avoid further proliferation. Basic criteria must be established to set the direction.

This path should not be so constrained that it suffocates innovation and advancing technology, Folts advised.

The emergence of microprocessor technology is probably the most profound factor influencing new work. As a result, procedural software considerations take precedence over hardware and logical considerations of the past. This adds flexibility since variations can be more easily accommodated, he explained.

This ease of accommodation should lead to a considerable reduction in controversy over issues affecting national alternatives. But it does not mean wholesale alternatives should be allowed to meet any whim, Folts stressed.

The jungle of data commmunications standards can become an orderly cultivated field supporting the spectrum of user applications efficiently and economically, he said.

Turning to the adoption of the X.25 standard, Folts said the standard for packet-switched services includes the first interface to explicitly describe the three levels of data communications architecture. This work must continue in an orderly fashion.

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But Solution Held Possible

Nations Seen at Odds on Software Protection

CW at ICCC '78

By Ronald A. Frank
CW Staff

KYOTO, Japan — After 10 years of study, there is still no unity of opinion among nations on the legal protection of software, according to George K. Davidson of the Canadian Department of Communications.

Speaking at a session on privacy and security at the International Conference on Computer Communication (ICCC-78) here recently, Davidson said the World Intellectual Property Organization (Wipo), a nongovernment body representing many nations, has decided that full protection cannot be given to software under existing laws. As a result, Wipo has drafted a model for a new law.

On the other hand, Great Britain and the U.S. "lean heavily" toward copyright protection, but their arguments concerning the key issue of software use in a computer are neither similar nor convincing, he said.

In Canada, two government white papers concerned with patent law and copyright law, respectively, have separately proposed that no protection be offered for the use of software in a computer.

In addition, Japan has elected to support patent law so long as "laws of nature" are excluded from the conception of the program.

Working Solution Possible

However, despite the divergence of views, it is possible to suggest a working solution to the problem, Davidson said. Software, including programs and data bases, undeniably has rights to protection under both patent and copyright laws as they exist. In the case of copyright law, protection should be improved by minor modifications, he said.

The ultimate issue of software use in a computer may eventually require a new law, but there is reason to defer such a new law because technology in the form of microcircuits may be well on the way to "producing its own solutions," he said.

In order to make the most of the present situation, three assumptions are necessary, according to Davidson. First, a broad definition of software, including programs as an element, should be used. Second, it should be recognized that software can be either nonresident or resident in a computer. And third, no requirement should be placed on present laws that would reduce their effectiveness.

Three More Assumptions

Policy decisions can be made in this area, he continued, based on three assumptions: that all nonresident software will be protected under copyright; that resident software may be protected under existing laws; and that resident software will be protected and new laws will be written.

The main argument advanced for protection of resident software under copyright law is that when a program is running in a CPU, this constitutes only a simple set of instructions in the program. This argument must be rejected because it "undervalues the performance of a computer system," Davidson said.

Rather, a CPU running an applications program goes through a powerful set of operations controlled inherently by its hardware and operating system and only incidentally by the particular applications program.

If these arguments are accepted, then the second assumption could be changed to state that resident software may be protected under existing patent law.

Operating Systems Patentable?

It should also be accepted that resident software cannot be protected under copyright law. As a result, operating system software may be patentable and could also be copyrightable, according to Davidson.

While systems software may be protected under patent law, Davidson suggested that such use of the law should be discouraged "in every practical manner."

There is still a gap in the protection of resident software, but Davidson advised waiting to see what happens with technology before drafting new laws to cover this area.

Three-Day Computer Show To Open in Toronto Soon

TORONTO — "People, Data and Systems," will be the theme of the upcoming 1978 Canadian Computer Show, to be held at the International Centre of Commerce here Nov. 28-30.

Sponsored by the Canadian Information Processing Society (Cips), the conference will offer three sessions per day, and each day will have its own subtheme, according to a Cips spokeswoman.

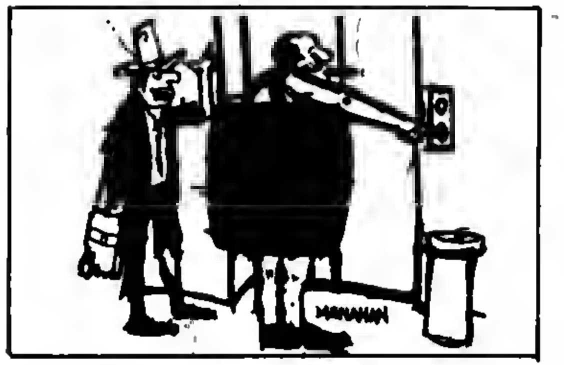
The first day's theme will be "The DP Staff Dilemma: How Much Talent Do You Drive Away?" Sessions will include "Career Opportunities for the DP Professional," "How to Keep Your DP Staff" and a panel discussion on "Is Our Raw Material Suitable?"

The second day's overall theme is data and will include "The Technology of Data Storage," "Public Access of Data" and "Business Data Communications in Canada."

"Systems Are For Users — Displacing Motherhood With Methodology" will be the theme of the third day. Sessions that day will include "An Update On User-Oriented Approaches to Information System Development," "Determining Information Requirements" and "Incremental Information System Development — A Prototype Approach."

The registration fee is $45 for one day, $85 for two days and $125 for all three days, if paid in advance. At the door, the fee for one day is $60, for two days, $110, and for three days, $150.

Additional information is available from Cips, Suite 214, 212 King Street West, Toronto, Ontario, M54H 1K5, Canada.



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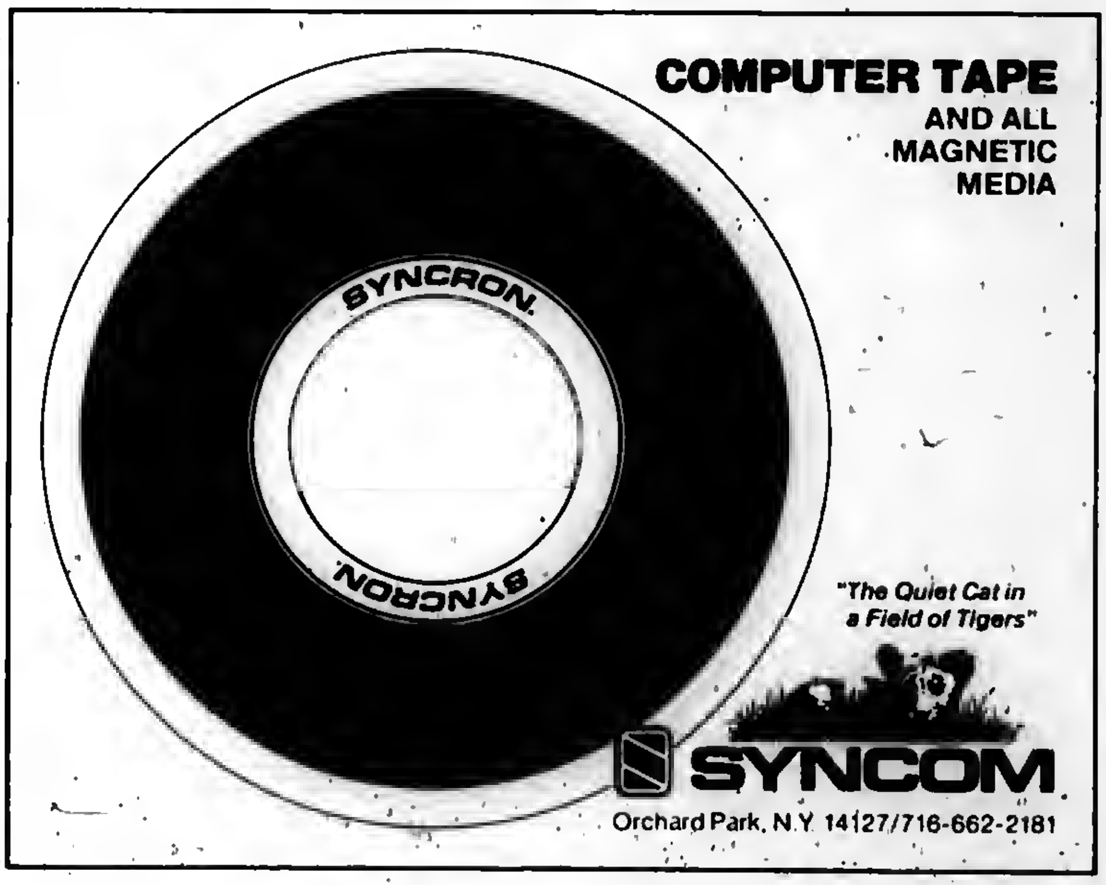
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Computerized Mail Seen Future Office Benefit

By Ronald A. Frank
CW Staff

KYOTO, Japan — The real benefits of the office of the future may lie in computerized mail instead of word processing. And if the behaviorial problems can be overcome, computer mail could provide the greatest benefits in office automation, according to James H. Bair, a senior information scientist at SRI International.

Word processing concentrates on streamlining the secretary-typist functions in the office, but statistics show that this function accounts for only 6% of the labor costs of U.S. business, Bair told a session on computer-based office systems at the recent International Conference on Computer Communication (ICCC '78) here.

In contrast, nonclerical labor costs account for 66% of total costs, and this is the area where the real payoff for the office of the future may be, he said.

CW at ICCC '78

Only 20% of the average secretary-typist's daily time is devoted to typing, so word processing systems are aiming at only a small portion of regular office operations. But a study of activities by nonclerical office people shows a greater potential for computerized benefits, he said.

Bair defined the nonclerical area as consisting of two categories: managers and professionals. According to one study, 95% of typical managerial functions are related to written and oral communications. Professionals or nonmanagers spend about 63% of their time engaged in written and oral communications, he explained.

It seems reasonably certain that technology in the form of computer mail can be used to support the communications functions in the nonclerical area. Several systems are already in operation to test the benefits of computer technology as a means of interpersonal communications in office automation systems, he said. One example is computer-based message systems used in the Arpa network.

These systems have shown that benefits in four areas can probably be translated into labor savings. The first of these is a reduction in what Bair called "shadow functions." These are the unpredictable time-consuming operations associated with typical tasks in the interpersonal communications process.

For example, only 28% of business phone calls make connection with the called party. The rest of the time is consumed by shadow functions such as leaving messages for the intended recipient, Bair noted.

A second benefit area would be message cuing, which he defined as a potential labor savings based on the elimination of interruptions. Phone calls are now delivered at times when ongoing work is interrupted, and these interruptions have a strong negative impact on the quality of work. That effect could be eliminated by a cuing system that would deliver messages at appropriate times.

The third benefit area lies in automating such routine functions as addressing, labeling, dating, formatting, distributing, storing and signing. Even if these operations are performed by a secretary, the tasks must first be explained. Automation would allow direction control of these types of operations.

The fourth benefit area was defined by Bair as media transformations. Included, for example, were changing the medium of the message from speaking to writing, from handwriting to typewriting or from dictation to typewriting. A reduced number of such transformations would be required if the system were computerized.

Profound Changes

Profound changes in the fabric of organizations and the sociology of interpersonal communications would be associated with these areas, Bair pointed out. But to date, "no negative consequences of computer-mediated communications that would be cause for limiting usage have been uncovered," he told the attendees.

Attaching cost savings to the computer mail area is difficult, but the savings can be estimated based on currently available systems. Using Hewlett-Packard Co.'s Comsys and Tymnet's OnTym services, it is generally accepted that it costs less than $1 per message, Bair said.

Assuming that a user will send and receive an average of four messages per hour, and using a composite figure of $2 per message sent and $1 per message received, a typical hour's worth of messages would cost about $6. Using an estimated six hours of communications per day, this represents a 33% reduction in potential labor savings, Bair explained.

Stressing that these figures were conservative, he added that more study is needed. Nevertheless, he said, it can be concluded that computer-based interpersonal communications technology is cost-effective.

Despite the apparent benefits, major questions remain. Typing is required by all users and since some people look on this function as demeaning, they have not developed this skill. But most executives and administrators can learn to type on a computer terminal

(Continued on Page 23)

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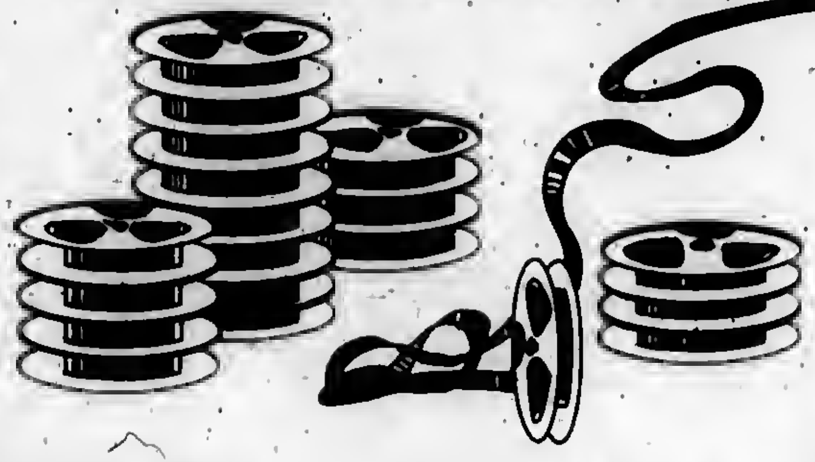

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Models to Help Predict Global Climatic Change

By Jake Kirchner
CW Washington Bureau

CORVALLIS, Ore. — Sophisticated computer modeling techniques are being used by a research group at Oregon State University to make predictions on earth climatic changes and to gauge man's effect on the world's climate.

Supported by a $225,000 grant from the National Science Foundation (NSF), the Climatic Research Institute (CRI) here is using a Cray Research, Inc, Cray-1 large-scale system to refine several computer models of global climate. The models will later be used to predict climatic changes.

The purpose of the project is "to learn why climate is the way it is and what controls the changes of climate that we know have gone on and that we expect will go on," according to Prof. W. Lawrence Gates, the institute's director.

On a more practical level, Gates noted, climate "has an enormous impact on man," and it would be very valuable to know what changes in the climate will take place and what effect, if any, man has on climate.

Carbon Dioxide

The first major experiment, he said, will be to raise the level of carbon dioxide in the model to try to determine the effects on global climate of the atmosphere's increasing carbon dioxide content. Through the burning of fossil fuels, man has raised the worldwide level of carbon dioxide about 20% since the beginning of the industrial revolution 100 years ago, Gates explained.

He predicted that by early in the next century, that level might be 100% higher. Such a level could produce enough warmth in the atmosphere to melt the polar ice regions, drastically changing the climate of the world, with severe concomitant economic changes, he said.

Since 1971 the institute has been refining two computer models — a numerical model of global atmosphere and a numerical model of global oceans. Gates said the researchers have been looking at "how well [the model] simulates what the real world looks like."

They try to define what is happening with the climate and use that information to refine the models. Gates said they compare the models' projections with known data, such as that provided by weather satellites.

Bob Mobley, the institute's director of computations, explained that the models contain grid lines for every five degrees of earth longtitude and every four degrees of latitude. The models provide climate values for the intersections, or nodes, of the lines.

Values programmed into the model for each node on the grid include those for wind velocity, ground temperature, air temperature, barometric pressure, definition of surface (such as desert, forest or grassland) and solar radiation.

The models, which are written in Fortran, produce information on a global scale that can then be analyzed by different regions, according to researcher Gates.

Forward Integration

Mobley explained that the researchers start with the values provided for the model grid and then integrate forward in time, using a set of differential equations. Using the Cray-1, he said, they can simulate one day of the world's weather in 40 seconds of computer time.

The Cray-1 is owned by the National Center for Atmospheric Reseach in Boulder, Colo., and accessed over dial-up lines by the Oregon researchers. Because the Boulder center is also financed by the National Science Foundation, CRI is allotted free computer time, Mobley said.

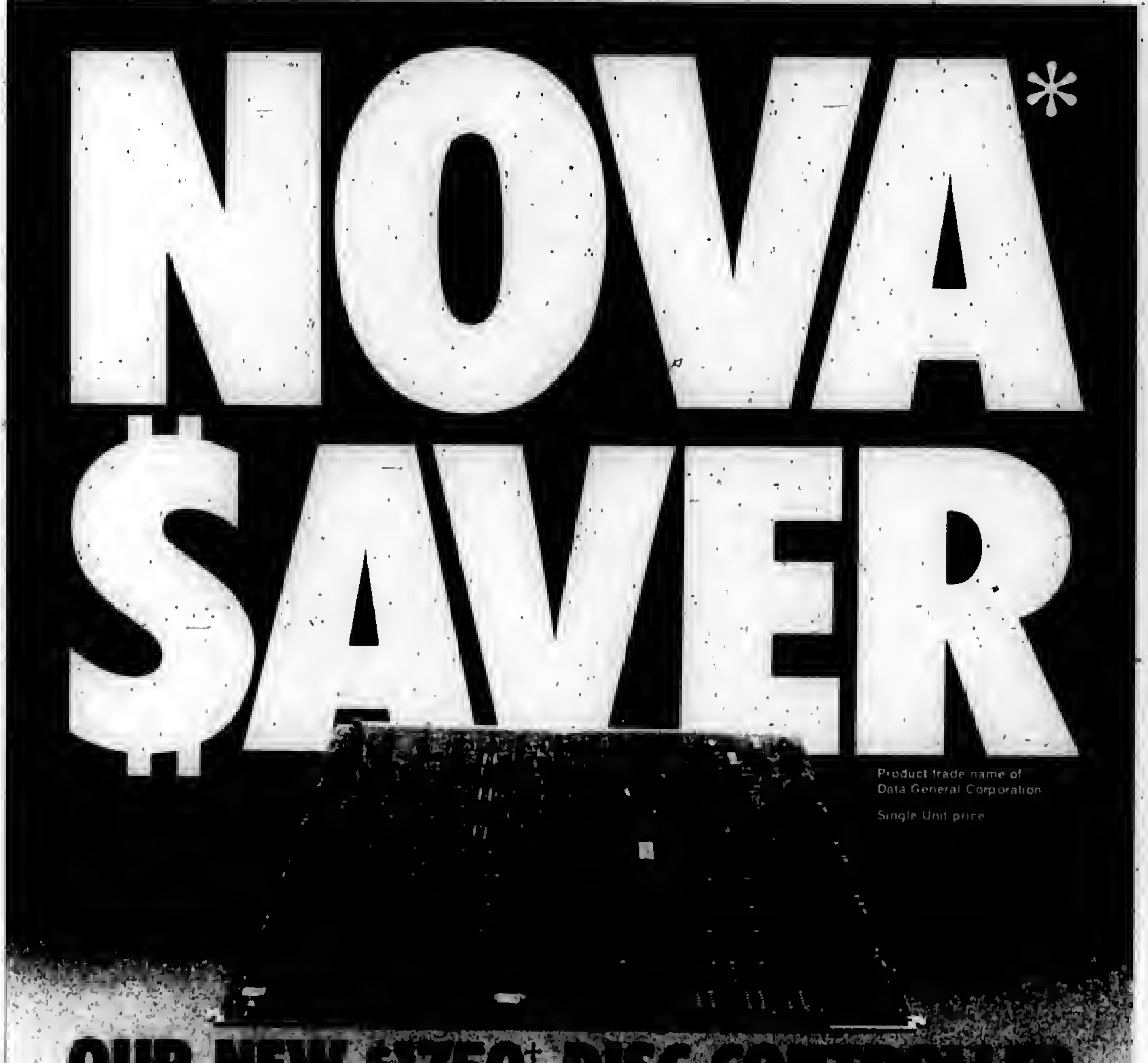
For 1978, he said, the project was allotted 50 hours on the Cray-1 as well as 50 hours on a Control Data Corp. CDC 7600, also at the Boulder center. CRI hopes to be given 100 hours of Cray-1 time next year, Mobley said, as well as time on a National Aeronautics and Space Administration Amdahl Corp. 470V/6 located in Greenbelt, Md.

Renewable Grant

The NSF grant is renewable for another two years, and the institute is hoping for an increase next year over the 1978 $225,000 figure, Mobley said. A major item in the institute's budget will be the purchase of a minicomputer to access the several mainframes the group will be using, he said.

Mobley said he has not issued a procurement request for the mini yet but will be looking for something in the Digital Equipment Corp. PDP-11/70 class.

A minicomputer has rarely been used to access one or more large mainframes on as large a scale as the institute plans, Mobley said.



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Tells Others to Get Involved

Student Winner Reflects on Israeli DP Contest

By Denise Petski
CW Staff

NEWTON, Mass. — Qualifying for an all-expense-paid trip to Israel was hard enough for Eric Enderton to believe when he and three other team members were selected to compete in the Jerusalem Conference on Information Technology's International Youth Competition in Computer Science in August. But to actually win was beyond belief, 16-year-old Enderton said in a recent interview here.

The Santa Monica (Calif.) High School senior, accompanied by fellow team members Alex Melnick and Chris Pettus, won the programming competition in Israel by scoring 195 out of 200 possible points in the final competition. The U.S. team beat Emek Hefer Regional High School and Midrashiat Noam-Yashiba High School of Pradeff-Hanna to win the cash prize of 5,000 pounds, or approximately $250.

The U.S. contenders qualified for the final competition by first winning a local and semifinal competition, both of which were held in California. In the local competition, the team competed against about 20 other teams. The entrants were given a written examination, a programming problem to be solved at a terminal and a short oral quiz, Enderton explained.

In the semifinals, the contenders were reduced to four teams — two from Southern California and two from Northern California. The requirements were the same as for the local competition but without a written examination, Enderton said.

Jerusalem Competition

Victory in the semifinal competition brought the Santa Monica team to Jerusalem.

In the first part of the final competition, each member of the team — while seated at a computer terminal — was given 1-1/2 hours to solve two out of three programming problems. The second part consisted of a two-hour question-and-answer period in front of an audience. Each part was worth 100 points; 200 total points were possible.

All programming for the competition was done in Basic, according to Enderton. The Santa Monica team programmed in Digital's Basic Plus and said it helped them win the competition, especially with one question which involved a recursive function.

During the question-and-answer portion of the competition, the team members were seated at their terminals onstage. Each team member was given an identical mathematical question in an envelope. He worked independently to solve the problem, using the terminal if he wished.

There were a total of six questions to be answered in three to five minutes. The written answers were handed to the judges for their decision, which was then read aloud to the audience.

Eric Enderton

Enderton noted that teammate Alex Melnick was able to figure out the answer to one question faster mentally than Eric could by programming the question into the terminal.

Fascinating Place

Israel proved to be a fascinating place for the students, with Israeli families in Tel Aviv hosting the young men at their homes. An interesting side trip for Enderton was a visit to the home of his host family's relatives. The sights of Jerusalem and Bethlehem were enjoyed by all during available free time.

Enderton pointed out that he was introduced to computers and programming by his father who is a mathematics professor at the University of California at Los Angeles. He took his first and only computer programming course in the eighth grade.

Enderton attributed his success in programming to the availability of his high school's computer facilities and the experience and guidance of older students at the school. He is well-versed in Basic, Fortan, Cobol and at least two assembler languages.

Employed as a part-time computer programmer at RCW Computing

(Continued on Page 22)

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WASHINGTON, D.C. — A five-day workshop in structured design and programming will be held here Oct. 30-Nov. 3.

Sponsored by the Brandon Systems Institute Public Service Corp., the workshop is intended primarily for programmers, systems designers and systems analysts engaged in the development, implementation, conversion and maintenance of applications or system software.

Upon satisfactory completion of the course, according to sponsors, attendees will be able to define, design and program a structured module using functional specifications, basic control patterns and formatted code; a structured program using functional decomposition; and a structured system using data flow analysis, functional decomposition and flexible resource allocation.

The course fee is $695, which includes each day's luncheon and reference materials. More information is available from Brandon Systems Institute Public Service Corp., 4720 Montgomery Lane, Bethesda, Md. 20014.

Knox Honored At IIA Meeting

PHILADELPHIA — William Tyndall Knox, founding board president of the Information Industry Association (IIA) and former director of the Department of Commerce's National Technical Information Service, was inducted into the Information Hall of Fame at the association's annual meeting here recently.

Celia Deese Knox accepted the award, presented posthumously to recognize her husband's service to the industry as a pioneer in the field of information.

"Without the foresight and hard work of Bill Knox, the information industry might not have an association today to focus public attention on its contributions and to represent its view in the area of government relations, copyright and other vital issues," according to Paul G. Zurkowski, current IIA president.

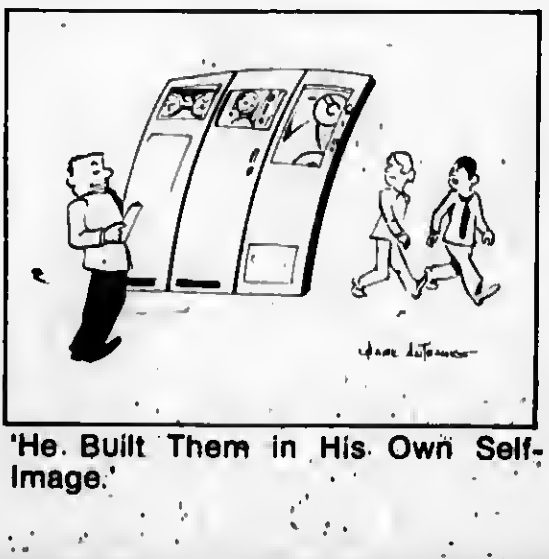
Student Winner Ponders Meet

(Continued from Page 21)

Services in Santa Monica, Enderton is considering either computer science or music (possibly computer-aided synthesis) as a career. Enderton lists his favorite hobbies as computer programming and jazz piano.

When he entered his senior year at Santa Monica High School last month, fellow team member Alex Melnick entered his freshman year at the University of California at Berkeley and Chris Pettus entered his first year at the University of California at Los Angeles.

The Fourth Jerusalem Conference will be held in the next two to four years and Enderton encouraged other high school students to become involved in the worthwhile, educational experience. Interested persons may contact Anthony Ralston, conference chairman, State University of New York at Buffalo, 4226 Ridge Lea Road, Amherst, N.Y. 14226.



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Conference to Examine Data Regulation Issues

NEW YORK — The International Conference on Data Regulation — European and Third World Realities will be held at the Sheraton Hotel here Nov. 28-30.

The conference will present international representatives from commerce, industry and government to analyze the burgeoning problems of transborder data flow and to provide information to aid in the planning of future international activities, according to the conference sponsors.

Among the 40 speakers taking part in the program are Jan Freese, director-general of Sweden's Data Inspection Board; Hans-Peter Gassmann, head of information for the Computer Communications Policy Group of the Organization for Economic Cooperation and Development; and Gerhard Stadler of the Austrian prime minister's office.

Key American participants include Henry Geller, assistant secretary for information and communications, U.S. Department of Commerce; Richard Neustadt, assistant director of the White House Domestic Policy Staff; and William Norris, president of Control Data Corp.

Session Topics

Sessions will include "Data Flow Developments: Legal and Economic Dimensions"; "National Privacy Concerns and Actions," including the fundamentals of existing legislation and the question of international legal harmonization; and "Information and Communications Programs of International Organizations."

Also presented will be a session called "Towards a New World Information Order," which will examine global computer-communications opportunities and the establishment of national information strategies; "Multinational Corporations and Transnational Information"; and "Development of U.S. Policies."

The conference is being sponsored by Online Conferences Ltd., a British organization that specializes in the coordination of conferences in the fields of information processing and communications technology.

The delegate fee is $685, including documentation, daytime refreshments and a cocktail reception. Further information is available from The Wayne Smith Co., Suite 810, 500 12th St. S.W., Washington, D.C. 20024.

Future Office Benefit Seen

(Continued from Page 18)

with little difficulty.

If computer mail systems are implemented in the automated office, won't the remaining work expand to fill the available time? Is interpersonal communications via computer mail as effective as traditional modes of interaction? With regard to the latter, a certain level of face-to-face communications may be a fundamental human need, according to Bair.

Certainly more involvement and research is needed to study the human factor in this area, he said.

It is possible that increased productivity from the implementation of computer mail systems could lead to unemployment. But at the same time, low productivity among white collar workers "seems to be contributing to a general weakening of the U.S. economy, especially when it is compared with more industrious nations such as Japan," Bair said.

In any case, the evolution of technology to support interpersonal communications is here, and the prospect that such a system can be cost-effective is encouraging, he concluded.

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Calendar

Nov. 8-10, Washington, D.C. — 1978 **Analyzer Users Conference**, sponsored by Program Products, Inc. Contact: Michael Suscreba, Program Products, Inc., 95 Chestnut Ridge Road, Montvale, N.J. 07645.

Nov. 9, Framingham, Mass. — **Microfilm Technology Seminar**, sponsored by the National Micrographics Association, New England Chapter. Contact: Gary L. Moore, Seminar Chairman, c/o Ingersoll-Rand Co., 150 Burke St., Nashua, N.H. 03060.

Nov. 12, New York — **How to Be an Entrepreneur in the Information Industry**, sponsored by the American Society for Information Science's (Asis) Special Interest Group on Management of Information Activities. Contact: Asis, 1155 16th St., N.W., Washington, D.C. 20036.

Nov. 13-14, Houston — **Planning and Initiating the Data Base**, sponsored by Performance Development Corp. (PDC). Contact: PDC, 1101 State Road, Building M, Princeton, N.J. 08540.

Nov. 13-14, San Francisco — **Managing Data as a Resource**, sponsored by Data Resource Management Associates. Contact: Arnold Barnett, Data Resource Management Associates, 19 Orchard Way North, Rockville, Md. 20854.

Nov. 13-14, New York — **Federal Procurement Process**, sponsored by the University of Chicago. Contact: Heidi E. Kaplan, Department 20NR, New York Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Nov. 13-15, San Francisco — **Data Processing: An Introduction to Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 13-15, Washington, D.C. — **Increasing EDP Usage and Benefits Through Organizational Communications**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 13-15, Chicago — **Data Communications — Effective Network Design**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 13-15, Cherry Hill, N.J. — **Data Entry Management & Supervision Seminar**, sponsored by Management Information Corp. (MIC). Contact: Denise King, MIC, 140 Barclay Center, Cherry Hill, N.J.

Nov. 13-15, Los Angeles — **Interface West**, sponsored by Interface West, Inc. and *Datamation* magazine. Contact: Sheldon G. Adelson, conference director, Interface West, Inc., 160 Speen St., Framingham, Mass. 01701.

Nov. 13-15, New York — **Zero-Based Budgeting: A Planning Approach for Increased Productivity**, sponsored by the American Institute of Planners. Contact: Irving Levinson, Conference Manager, U.S. Professional Institute, 11009 Inwood Ave., Silver Spring, Md. 20902.

Nov. 13-16, Chicago — **Computer Software & Applications Conference**, sponsored by the IEEE Computer Society. Contact: Harry Hayman, P.O. Box 639, Silver Spring, Md. 20901.

Nov. 15-16, San Francisco — **How to Build and Use a Data Resource Directory**, sponsored by Data Resource Management Associates. Contact: Arnold Barnett, Data Resource Management Associates, 19 Orchard Way North, Rockville, Md. 20864.

Nov. 15-16, Kansas City, Mo. — 1978 **Mid-America Electronics Conference (Maecon)**, sponsored by the Kansas City section of the Institute of Electrical and Electronics Engineers. Contact: Maecon, P.O. Box 4356, Overland Park, Kan. 66204.

Nov. 15-17, Chicago — **Distributed Systems: Are They Right for You?**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 15-17, New York — **Effective Computer Operations**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 15-17, New York — **Effective Executive Speaking**, sponsored by American Management Associations (AMA). Contact: AMA, 135 W. 50th St., New York, N.Y. 10020. Also being held Nov. 20-22 in San Francisco.

Nov. 15-17, Stockholm, Sweden — **Microtech 78**. Contact: Microtech 78, c/o Stockholm Convention Bureau, Strandvagen 7 C, 114 56 Stockholm, Sweden.

Nov. 15-18, Anaheim, Calif. — 1978 **Western Educational Computing Conference**, sponsored by the California Educational Computing Consortium. Contact: Oliver Seely Jr., program chairman, Department of Chemistry, California State University, Dominguez Hills, Carson, Calif. 90747.

Nov. 16-17, San Francisco — **Data Communications: Advanced Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 20-21, Chicago — **Understanding Proprietary Software and How to Buy It**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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Managers on the Move

Spinelli

Thomas

ROSS F. SPINELLI has been named Director of DP at Bolton-Emerson, Inc. in Lawrence, Mass.

Spinelli was previously employed for nine years as DP manager for Gamewell Corp., formerly a division of Gulf & Western Industries.

• • •

KEITH THOMAS has been promoted to senior vice-president of DP at Commercial Federal Savings & Loan Association in Omaha, Neb.

Thomas joined Commercial Federal's DP department in 1961. He was named assistant vice-president and director of the department in 1970, then vice-president in 1973.

He attended Omaha University.

• • •

RONALD NIPER has been elected a vice-president in Irving Trust Co.'s computer processing division in New York City.

A graduate of Pace College, Niper joined in 1977 as an assistant vice-president. Prior to that, he was an assistant vice-president of the European American Bank, where he was manager of equipment research and software development in the computer operations area.

• • •

MARILYN T. WELLES has been appoinfed security manager for the Comnet Corp. in Washington, D.C.

Welles, a graduate of Albright College in Reading, Pa., was previously employed at Booz, Allen & Hamilton.

• • •

KINLOCH F. DUNLOP III has become director of information systems at Wilton Enterprises, Inc., a Chicago-based division of the Pillsbury Co.

Dunlop was previously employed as director of systems and DP for Congoleum Corp. in Milwaukee.

• • •

FRANCIS B. PHELAN has been promoted to the position of day manager/DP computer operations of *The Washington Post* in Washington, D.C.

Phelan joined *The Post* in 1977 as a computer operator and was promoted a year later to computer operations supervisor. Before that, Phelan was computer operations manager for the U.S. Chamber of Commerce.

• • •

FRED C. DAVIDSON, VIRGINIA C. BURTNETT and RICHARD D. PULLINGER have been named to new positions in GTE Data Services' Northern region.

Davidson, formerly management information systems manager in corporate accounting for GTE Sylvania, has been named northern regional network director. Burtnett, formerly Midwest regional operations manager, has been appointed Fort Wayne data center director, and Pullinger, formerly Northwest regional services director, has been named Erie data center director.

Davidson holds a master's degree in economics from the University of Virginia. He joined GTE in 1952 as a systems and programming supervisor.

Burtnett is a graduate of Vanderbilt University. She joined GTE in 1972 after working as a programmer for the General Telephone Co. of California.

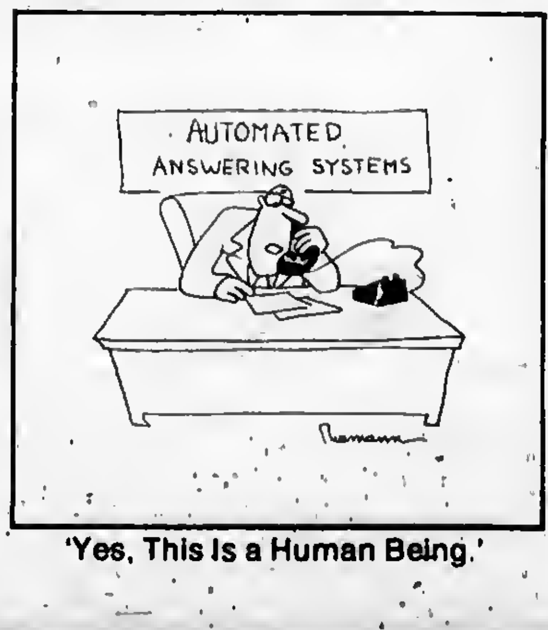
Pullinger was employed by the Bell Telephone Co. of Pennsylvania before joining GTE in 1969 as a systems supervisor for the Fort Wayne data center.

• • •

STUART J. YUILL has been appointed senior director of data communications services at Aeronautical Radio, Inc. in Annapolis, Md.

Yuill was employed by the Defense Communications Agency before joining the Aeronautical Radio, Inc. Research Corp., where he was a principal engineer.

Yuill is a graduate of Johns Hopkins University with a B.S. in engineering. He received his M.S. in electrical engineering from Northeastern University and is completing his doctoral research in the area of computer communications by satellite.



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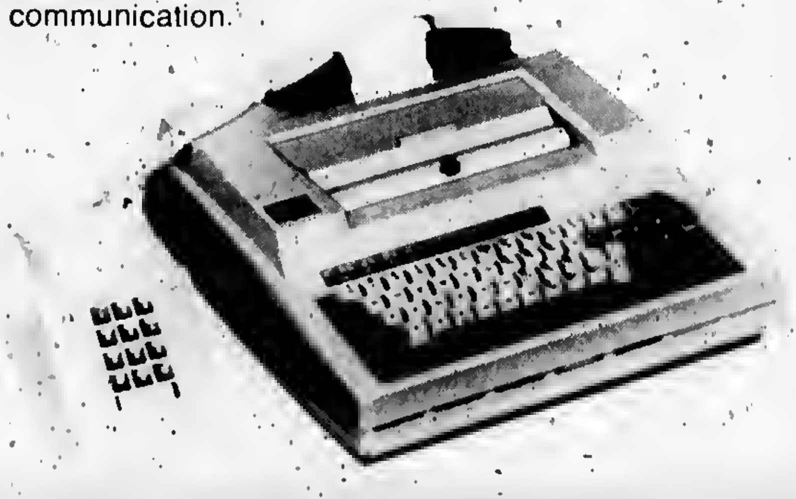

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Editorial

Zapped by the Zip

The impact on DP operations of adding four digits to the Zip Code may not be appreciated by the U.S. Postal Service, which recently announced that the digits will be added by 1981 "to help keep down postage rates" [CW, Oct. 2].

The transition from a five- to a nine-digit format will force many DP departments in the private and public sectors to undertake a massive rewriting of data base software. Since the Postal Service monopolizes the mail industry — which is vital to any organization — it plays the music to which all businesses and agencies must dance.

DPers therefore must adapt to this new format in the next three years. Many face nontrivial and costly programming tasks in the changeover process, including redefinition of data structures and rewriting I/O routines and job control procedures.

Further, the hardware constraints of existing systems may impede or even prevent the changeover, forcing DP management to extend or replace system configurations.

For example, many software designs have Zip Codes stored as elements of arrays written in a high-level language. On many computer systems, five-character strings may be stored as array elements, but not nine-character strings.

In such cases, the nine-digit Zip Codes could not be stored or manipulated in the same manner as the old codes; hence, a different software design would be needed.

Moreover, the size of disk files will have to be extended to accommodate the new format, entailing a need for more memory. Another consequence could be a significant hike in I/O and network communications costs as the number of characters per jobstream grows.

The Postal Service plans to employ optical character recognition equipment to scan the nine-digit codes, allowing "eight or nine [postal] workers to do the work now done by 20," according to Postmaster General William F. Bolger. The extra four digits will designate a street block, allowing more efficient sorting of letters and parcels on the basis of mail carrier "beats."

Although the extended Zip Code could make life easier for postal workers, it is not clear whether any benefits will be passed to the whole of society. Postal rates are not likely to decrease, so at best the policy change will retard an inevitable increase.

But what difference does this make if a leveling off of one set of charges is more than offset by a rise in another set of charges — the costs associated with DP?

Unless the Postal Service can reasonably argue that a nine-digit format will benefit the society it supposedly serves, rather than just itself, the DP community — among other segments of society — should protest this policy change.

Even if the changeover is justified, there should be strong assurance that, in the style of postage rates, a 15- or 20-digit format will not follow soon afterward.

Data Past

Eight Years Ago
Oct. 14, 1970

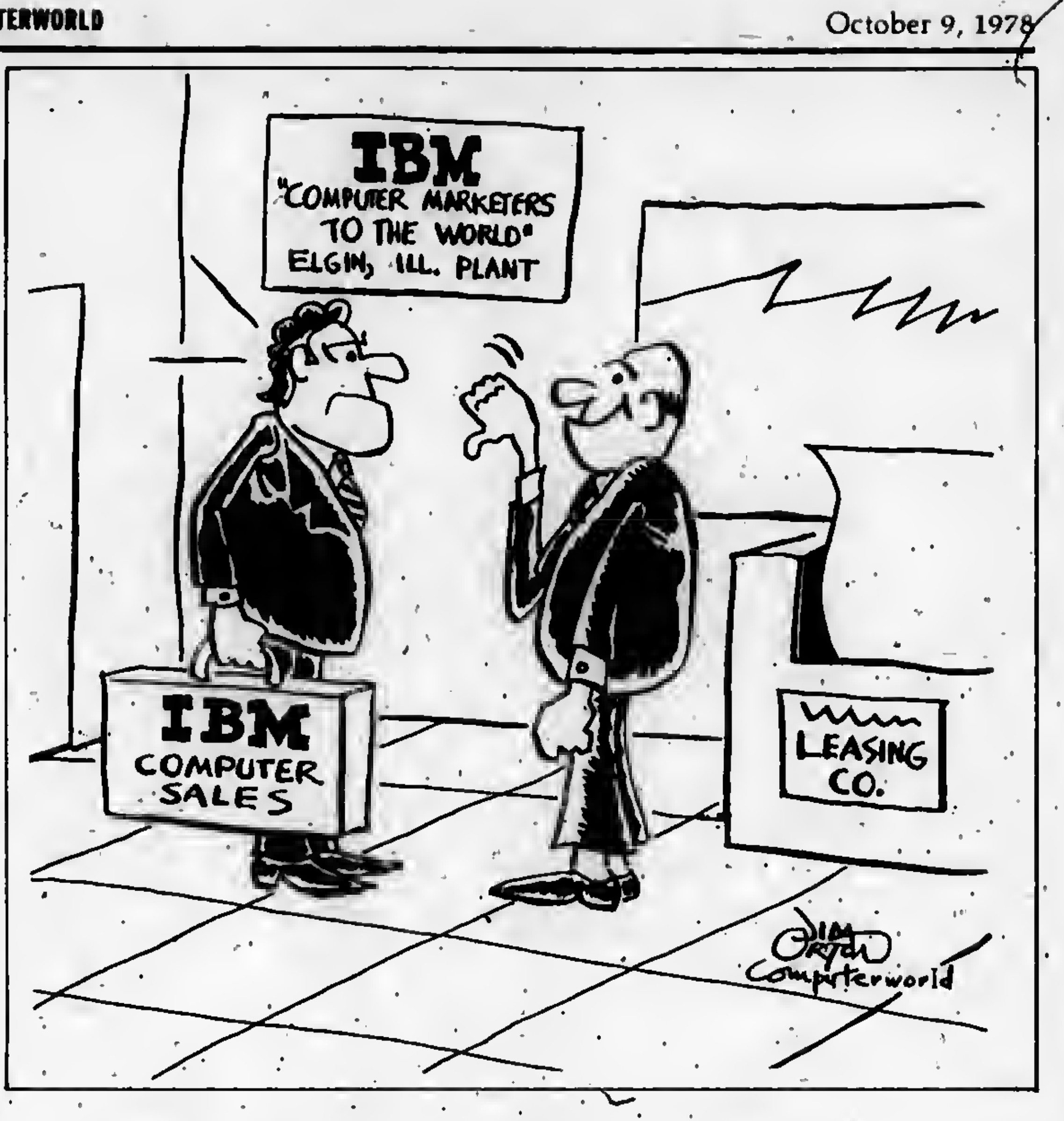
DETROIT — As the time for the general election in November drew nearer, more and more irregularities with the August primary were discovered. Many of Detroit's troubles with an extra vote count seem to have been caused by partly perforated punch cards. The improper removal of chads from the punched cards compounded the prohlem.

— — —

CAMBRIDGE, Mass. — Fifty dollars was the prize in a contest that required designing the most effective plan for destroying computerized information. The contest was sponsored by two graduate students of computer science at Harvard who admitted to being concerned over the potential misuse of the blueprints for sabotage, but they considered the contest the most effective way to arouse public concern over the misuse of computers and to deter large organizations from abusing privacy and data banks.

— — —

NEW YORK – Burroughs Corp. unveiled a family of systems that would succeed the B5500 and more powerful systems. The B700 series was unveiled with the announcement of three models — B5700, B6700 and B7700 — which compared with the three announced models of the IBM 370 series and with the top of the 360 line on a price/performance basis. Burroughs also introduced a disk pack storage system, the B9484, similar in performance hut lower in price than the IBM 3330, and an expanded head-per-track disk drive, the B9472, for use with the company's optimized access memory banks, which queue randomly accessed data.



Letters to the Editor

Intention Missed

Judging by some reactions I received personally and by Stockenherg's letter [CW, Sept. 25], Computerworld's decision to omit the last two paragraphs of my article on IBM's Extended Control Program Support (ECPS) [CW, Aug. 28, Sept. 4] has caused some people to come to a conclusion in direct opposition to the intent of the article.

First, the benefits of ECPS were not ignored. It was the intent of the article to argue that, despite the significant improvement in performance, it is the functional improvement that is the most significant aspect of the feature.

Second, the article intended to allay the fears of potential plug-compatihle CPU customers by pointing out that a plug-compatible manufacturer could provide a feature such as ECPS. It hardly sounds like sour grapes to point out that IPL offers an ECPS which contains more function than IBM's and will soon have the only 3031-class machine with the full ECPS.

Charles A. Cornell
IPL Systems, Inc.
Waltham, Mass.

Deafening Silence

Up until now, the computer industry has met the new nine-digit Zip Code proposal with deafening silence. It is understandable why vendors would welcome the change; it is a bonanza for everyone from form suppliers to mainframe manufacturers. Addressograph-Multigraph Corp. alone will make a fortune replacing all the obsolete plates.

But where are the users who must pay programming, operations and hardware overtime to change programs, rebuild files and retest practically every nonscientific application in the country?

Write your congressman now. There is a plan to extend the Zip Code again in a couple of years to 12 digits. Apparently, the costs of these conversions to American business and taxpayers are of no consequence to the post office monopoly.

Frances Smith Abernathy
Rockville, Md.

Too Many Bureaucrats

Charles R. Conner's article "Certification Does Not Produce a Professional" [CW, Sept. 18] seemed to squarely meet the issue of certification. A piece of paper does not make someone a professional, nor does it do much to ensure that the holder is either capable or honest. What it does ensure is that someone will make a lot of money out of certifying programmers, analysts or whatever.

Trying to liken a programmer to a lawyer is a poor analogy. Has anyone made a count of the number of lawyers who went to jail (or should have gone to jail) as the result of Watergate? How many congressmen-lawyers have taken bribes from Tongsun Park?

What does certification really do for a programmer? Does it ensure that he is competent, or does it merely show that the programmer is also a good test-taker? How many of us knew people in school who had mastered the art of taking tests but really knew nothing of their subject?

Let's ask ourselves some simple questions: Aren't we regulated enough? Aren't there enough government agencies running our lives without adding another? Aren't there enough otherwise unemployable bureaucrats telling us what to do, and when, and how, without adding a state director of data processing certification and his well-paid (from our tax dollars) staff?

Chris Rohrs
W. Chicago, Ill.

The Human Connection

Terminal Training Mode Wins Executives

By Jack Stone
Special to CW

Training top executives who are not in the information systems swim is certainly one of the toughest intellectual challenges we have in the business. The need, of course, derives from the well-known fact that their abysmal lack of knowledge in the area almost invariably leads to poor, if not disastrous, decisions.

Last week, I described three basic rules of concepts training for executives that I have found useful. These rules, which derive from the premise that successful training of top executives requires their intense involvement, are: use interactive terminals, give briefings, not lectures, and put a touch of class into the production.

There's much more, of course, to the development of a successful program. To illustrate, I wanted to relate a recent experience of mine which involved the training of some top executives of one of my customer organizations, who, although they had a background in electrical systems, were very short on data systems knowledge.

I advised my customer of the idea of using interactive time-sharing terminals for basic training in data systems, which constituted only a part of a larger program. My immediate contacts were enthusiastic about the notion, although they indicated that much hard work was necessary to absolutely ensure a successful reception by the "student" executives. There were, however, some advisers who acted as "prophets of doom and gloom." They said the risk of failure by using terminals for executive training was unacceptably large (when contrasted with archaic, but safe, lecture methods) because:

- "They will be embarrassed because they can't type."
- "We will look bad when the mainframe fails, and it will."
- "They will get confused by the logon procedure."
- "They will frustrate quickly when they don't grasp the concepts."

Negatives Overruled

At any rate, the "negative Nellies" were overruled. Here's what we did, working as a team:

There were three hands-on instructional modules, each designed to run for a little more than an hour. The modules covered the three subject areas of: terminal operations (keyboard/screen device in local mode), on-line execution of programs (using canned programs in the time-sharing environment) and on-line program development (with interactive Basic).

Each module was organized into this format: an instructor briefs the audience for about three minutes with a general overview of the systems concepts that will be examined, plus a couple of minutes of comments on the hands-on procedures and projects to be accomplished. Then a short movie is shown, which further explains the concepts to be discussed. The movies were selected because of their capability for presenting the material in a humanistic and not mechanistic kind of way.

For the next step, the attendees filed into the terminal area, where the terminals were already operational and logged on.

Each pair of executives shared a terminal, taking turns at the keyboard, although they were encouraged to work together to figure out the proper entries. Each person had a workbook of our design which used every technique imaginable to make the instructions for each project clear, concise, complete and consistent: large-size type fonts, new project on new page, sample answer (hard copy of a typical interactive sequence) and brief narratives to introduce major groups of projects.

But more important, we tested those sequences over and over again on the terminals to make sure the procedures were flawless.

We also spent quite a bit of time building a project which required that the students use a step-by-step procedure for constructing a small Basic program. We then modified the logic.

The success of the terminal training is best conveyed by this comment from one of the instructors: "When the executives arrived, they were very doubtful they would learn anything about systems. But after the first hands-on session, we practically had to use crowbars to pry 'em loose from the tubes."

Repeating the offer I made last week, if you want a free copy of the second edition of my informal paper on "Training the Top Executive," send a self-addressed, stamped (30 cents) envelope (no. 10) to me at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007. And if you have had any experience with executive training you wish to share (identities not revealed), send it along.

The Taylor Report

Two DP Crimes Covered In One Day in Nashville

By Alan Taylor
Special to CW

On Sept. 26, I was in Nashville, Tenn., to talk about computer crime with the local chapter of the Association of Systems Management (ASM); I came away thinking Nashville had plenty to teach me in a day on the subject. Quite a bit of this knowledge came from the pleasant, intelligent group at the local ASM chapter, but still more came from the local newspapers — *The Nashville Banner*, in particular.

The *Banner* covered two separate computer crimes that day — one case was in court and the other was just taking shape, with the arrest of suspects. First let's examine the case that was in court.

Gary Denami, a 29-year-old former short-term employee in the DP department of the First American National Bank, was arrested last December for attempting to cash bad checks.

While in the jail cell, he reportedly borrowed a match from a pair of drunks locked up with him and burned a $10,000 cashier's check — part of the vital evidence in the case. That $10,000 check represented part of Denami's success in cashing a worthless check.

Denami's defense centered on the computer balance of $78,556.32 in his bank account. Since there was a large balance showing, why was the check "worthless?" I left Nashville before the jury made its decision — but the facts of the crime are important.

Adequate Check?

The First American National Bank used an on-line computer system which was only balanced every 24 hours but which paid out within minutes. Verification of the input before payment consisted only of checking that it had come in on "one of the bank's phones," according to George Publow, a former assistant manager at the bank.

On Dec. 16, Denami was apprehended with more than a few $15,500 checks made out to himself, on his person, as well as a packed suitcase and a newly acquired passport. He had apparently gone to three of the bank's branches and succeeded in cashing one of the worthless checks before he was arrested. It seems the stack of checks would have just about emptied his registered balance in the computer.

It was found that on Dec. 16, at 9:10 a.m., Denami's bank balance had mysteriously climbed to $78,556.32 as a result of a message from one of the bank's

(Continued on Page 32)

Sociology of Computing

Time-Sharing 'Messiah' Triumps Over Managers

By Miles Benson
Special to CW

Time-sharing is one of those things like pregnancy — you either have it or you don't.

What I mean is, when it comes to the use of time-sharing facilities for software development in a company, the company either does it or it doesn't. Rarely does a company allow programmers or projects the option of choosing between time-sharing and batch development.

Clickety-Clack and Western Railroad is one of those nontime-sharing shops. It is an unwritten company policy that "thou shalt hold no CRT images before thee, and thy testings shall only spew forth from a batch printer." As if, parenthetically, someone had said, "If God intended for people to talk to computers, he would have equipped them with modems."

And Slim Griffen knew that. When Slim hired in at Clickety-Clack five years ago and was given a tour of the computer center, his only comment had been, "But where is the terminal room?" When his manager-escort had responded "The what?", Slim's worst fears had been realized. A computing shop without time-sharing, Slim felt, was like a Cadillac in a gas crisis — it was elegant and impressive, but not of much value.

You see, Slim's computing career had been nurtured at P.Q. Aresti U., a favorite haunt of intellectual folk and a veritable bastion of belief in time-sharing. Basketweaving majors used terminals at Aresti. Janitorial services used a computerized manpower allocation system. And even the football coach played simulated games via a Decwriter in the locker room.

With that background, you may wonder why Slim ever accepted the offer from Clickety-Clack. Well, there are many perversities in human nature. Perhaps the worst of them is a missionary attitude. Slim really believed God was on his side and that time-sharing would eventually become a way of life on his new job. He even saw himself as the Messiah on the White Steed (his training in comparative religion was not up to the standards of his computer science, as you can see) who would ride in and slay the dragon of batch printers.

It was also true that he deeply wanted to live in the Monica Beach area along the Northern California coast, and Clickety-Clack was really the only computing game in town. But that practical explanation lacked romance, and Slim tried not to

(Continued on Page 30)

Time-Sharing 'Messiah' Victorious at Last

(Continued from Page 29)

think of it.

The Messiah biz at Clickety-Clack was frustrating, Slim found. No, not just frustrating — it was impossible. The power structure surrounding Slim hadn't the slightest interest in Slim's terminal-in-every-pot plot. And several years went by in which his White Steed stood around and swished flies with its tail, ate hay and did all the other things White Steeds are wont to do. But it never came near the batch printers.

But Slim was not a quitter. He still knew he was right. And if logic would not move the establishment, then perhaps being devious would.

Now it chanced that Clickety-Clack was involved in a peculiar business at the same moments in time in which Slim's devious plot was conceived. Although most of the software developed at Clickety-Clack was for internal consumption only ("sticking to our own tracks" was the mildly humorous in-plant expression), a decision had been made to develop some "end-product" software.

In the course of sticking to its own tracks, Clickety-Clack had built a fairly nifty train scheduling algorithm. When some of the other railroads began making inquiries about the system built on that algorithm (it was called Train Automated Routing System, or Tars), Clickety-Clack computing management quickly realized it had a potential money-maker on its hands. Its response to the other railroads was a brief description of the system and a promise that a proposal to define and implement a generalized Tars system for multirailroad use would be forthcoming.

And Slim was assigned to the writing of that proposal. The plot thickens.

A 'Natural'

Slim was a natural to work on the Tars proposal. He had designed most of the system and implemented a fair chunk. And what he hadn't built himself, he had learned inside-out. If anyone knew the Clickety-Clack-specific parts of Tars, the parts that needed redoing, it was Slim.

Well, to get the story moving again, Slim dashed off a technically credible, well-worded, tactically sound proposal in record time. It was when an audit committee was assigned to go over Slim's work before the proposal went out that the thickening plot really almost clotted.

I was assigned to that audit committee — along with two Clickety-Clack computing managers. I was asked to look at the technical details. The managers, naturally, looked at the Big Picture.

Slim had done a superb job. The managers were pleased with the Big Picture. The technical details were impeccable. And it was only on my second reading that I came to realize what Slim had done.

Buried deep in the proposal, in a section labeled "Implementation Methodology," was a pass-over-quickly sentence that said, "Development of the generalized Tars system shall be done in a structured manner, via a modular design and utilizing time-sharing techniques."

On first reading, I had zipped past it as Proposalized Motherhood. If I had quit then, no one else would have ever noticed it. Managers seldom read sections which begin with the word "implementation" or end with "methodology." That level of detail they generally find boring. And, of course, Slim knew that.

Have you got the picture here? Slim had slipped into a formal Clickety-Clack document a promise to use time-sharing. If it went unchallenged and a contract resulted from the proposal, Clickety-Clack's unwritten code *had* to change. Slim, mounted once again on his White Steed, had found a back-door approach to waging his fervent religious war.

And I was standing in his path. It was my responsibility, as part of the audit team, to report my findings. But — and here is where the plot really crystallizes — there was a loophole. Whereas the managers reported their findings to management, I needed only report my findings to the technologist — Slim.

I'd always been somewhat sympathetic to Slim's battle. I'm not sold on time-sharing as a way of life, mind you, but I'd like to see it tried in order to have more data for a better decision.

You see, I love the idea that management's disinterest in the details of computing technology can be used in potent ways against it. I think I slid Slim's devious plot through for that reason more than any other.

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Reader Commentary

A Sad, Partly True Tale

What's in a Name – Or Even in a Number?

By Barbara Mende
Special to CW

Once upon a time, there was a little computer named CIP 2200B. One day, he went to his parents, the Cincinnati Milacrons, and said, "I want to change my name."

"Why?" they asked. "Twenty-two hundred is a fine name, rich in tradition. Your Datapoint and Wang cousins don't mind it."

"That's the trouble," the little computer bleeped. "It's too common. Like 40."

"Don't exaggerate," his parents replied. "Forty is getting really common. It was good for a second name, like 360/40. But now that Dataspeed 40's getting popular, everyone'll be using it. We're sure that before the year is out, there'll be XL-40s and CS-40s and Cado 40s and all kinds of things. Your name isn't like that. But tell us, what would you like to be called?"

The little computer's screen blinked, then intensified: "George," he said.

"George! That's a people name! If you have a people name, you may start forgetting phone numbers!"

"My friend Adam has a people name."

"Adam's strange. He doesn't speak the same language we do. Besides, you always beat him at blackjack. You ought to play more with that PDP-11/03 down the street."

"He's no fun," the little computer said. "He's always doing his math homework. I used to like to play with some of the terminals. I once met one called Disco-Tec. My best friends were Mini Bee and Super Bee, but they moved away."

"Just as well," his parents answered. "You shouldn't be so frivolous. All you ever think about is Star Wars and Tic-Tac-Toe. Why don't you try to emulate the great computers, like 470V/6?"

"I'm only a kid," the little computer protested. "I wish I could play with the software products. They have names like Fats and Jasper and Panda."

"Software! Next you'll be wanting to hang around with the user groups. Now there's one in Chicago called Capone. Well, we'll make a deal with you. Change your name if you want, but we'll only support you for two years, and we won't get all your jobs for you. If you don't make it, that's it. You're on your own."

So CIP 2200B changed his name to George. Everyone admired him, and his big brother CIP 4400 even went into partnership with him for a while. But he couldn't make a living. So, true to their word, his parents cut him off.

Moral: If you think names are better than numbers, be a person or a race horse or a software package. Don't be a computer.

Letters to the Editor

Puzzled by Articles

A couple of articles in the Aug. 28 Special Report section have me very puzzled. "Virtual Memory Aids Support, Eases Upgrades" and "DBMS Now Powerful Tool For Small System Users" directly inferred that virtual memory and data based management systems (DBMS) are extremely valuable assets to both programmers and operators; this is very correct. What puzzled me was the inference in both of these articles that until very recently these characteristics have not been available on small business computers.

I'm not sure whether the blame lies with Microdata's public relations people or with the media, but the time has come to publish a well-documented fact. Microdata began marketing the Reality system to the end-user market in December 1973. Reality provided both a paged virtual memory system and a true DBMS that gave the small business computer user these capabilities.

John R. Kellgren
Scanning Systems, Inc.
Saint Charles, Mo.

It seems everybody is talking about distributed processing. That's understandable: the primary benefit – increased responsiveness to user needs – is an important objective.

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Two Crime Cases Point to General Problems

(Continued from Page 29)

phones or from the publicly accessible "Anytime" system. Furthermore, it was reported that some months before, Debami had shown his knowledge of the coding system used to mark up advanced deposits, to a new employee. Since that time, Denami had left the bank.

The question before the court was not about entering false deposits — the nature of electronic funds transfer makes that all but impossible to prove — just "passing worthless checks."

Computer Burned

The other computer crime reported in the local newspapers that day concerned a computer burned at the headquarters of Treetop Enterprises, a company that runs Waffle House restaurants in Tennessee and northern Alabama. On Sept. 4, an apparent arson attempt was made on the computer and the company records.

After the fire, some partially burned checks and records were found. The company decided to call in the auditors, although they had no previous qualms about the books.

The audit turned up a mysterious single entry of $161,000 in the company books. Between March and August, checks totaling $300,000 had been written against this balance — many of them in the $6,000 to $18,000 range.

The day before I arrived in Nashville, the company's receptionist and three outsiders were arrested. Arson charges were expected soon.

Both of these computer crime cases point to special problems. In the first, electronic funds transfer systems can be counterfeited without being caught because they are based on pulses, not signed documents which can be referenced and used as evidence.

The general problem is that the law is behind the times: paper evidence doesn't apply to electronic funds transfer crimes.

The second case involves the problem of one-sided entry. The $161,000 entry was left uncaught from March to September. Thus, computer accounting systems and check-issuing systems are quite vulnerable to manipulation.

Two in a Day

Finally, let us consider the way the two computer crimes coincided — the Treetop receptionist was arrested on the opening day of Denami's trial. Sophistication in computer crime is undoubtedly spreading and must now be considered as a general threat.

Nashville may be a center of government, religious publishing and music — but it's not widely known as a center of computer crime. Still, its newspapers covered two computer crimes in a day, which tells us something about the rapid spread of this type of crime.

We have emerged into a time of rapidly changing security. What was secure last year is not secure now. At this point, improvements in security, rather than in function, should determine whether our computer systems are adequate.

It is our professional duty to see that effective security is built into all systems. Users may believe in the "It can't happen here" syndrome. Well, if it can happen in Nashville twice in one day, it can happen anywhere at least once a year.

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"The Fortex fixed asset system is proven, concise, well documented... programs compiled, test system run within hours. An uncommon event."

Michael G. Morris
Financial Systems Officer
Virginia National Bank
Norfolk, Virginia

Mr. Morris calls it an uncommon event, but at Fortex it's merely our normal way of doing business. All Fortex software product systems are operational; they are production-proven systems; they are concise and fully documented.

All Fortex systems, fixed asset, credit or A/R; on line or batch are easy to set-up and install because they *are* operational systems. Refering to Virginia National Bankshares' purchase of Fortex PIMS, Mr. Morris stated, "...our data processing folks are much impressed with the concise, tested and well documented manner of the System. The material and information was so clear that the programs were compiled and the test system run within hours of receipt of the tape....an uncommon event."

But we realized our deepest sense of pride from what Mr. Morris describes as, "One of the most significant aspects of my dealing with Fortex...their excellent responsiveness to inquiries regarding use of the system, even in aspects for which it is not designed. This is again an uncommon occurrence in my experience."

When asked what he liked most about Fortex PIMS System, Mr. Morris stated, "to summarize, PIMS is: ☐ a concise, tested system with sound data processing integrity ☐ a well documented, user oriented system ☐ a system with flexibility for implementation ☐ a product from a company which has obvious pride. So, when your priorities dictate a new software package, call Fortex. We can provide you with a proven modular package that features ease of use, technical support, quick response, cost savings, DP efficiency and maximum maintainability.

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Morino Enhances TSO Monitor

ARLINGTON, Va. — An enhanced MVS version of the TSO/MON performance monitor is now available from Morino Associates, Inc. The product now permits a user to evaluate selected TSO command activity and performance information at the department, project or user level.

The MVS version of TSO/MON is available on a perpetual license basis for $9,500; SVS and MVT versions cost $8,900. More information about the product is available from Morino Associates at 1401 Wilson Blvd., Arlington, Va. 22209.

For 3270 Users

ADR Beefs Up Its 'Vollie'

PRINCETON, N.J. — A high-level procedure language, an updated system programmer's utility package and a series of statement syntax checkers are all part of the enhanced comprehensive on-line program development system Vollie from Applied Data Research, Inc. (ADR).

Version 2.0 of Vollie is designed for IBM 3270 CRT workstations and operates under CICS within a DOS/VS environment.

Command Executor

The package contains the Vollie on-line interactive command executor (Voice), which allows the user to write interactive command procedures to perform specific tasks, according to a spokesman. Voice can be used to execute a group of commands as a single command; accept input from terminals and write responses back; read from and write to members of the system's on-line library; and create screen formats for data entry.

The Voice procedures can also be used for arithmetic problem-solving applications, the spokesman added.

System programmers can utilize a number of commands that were recently added to the Vollie utility package. Users can display the directories of all active DOS libraries, volume table of contents (VTOC) information or data from the core image libraries; they can also change data in the libraries and any on-line files, the spokesman continued.

Syntax Checkers

In addition, syntax checkers allow programmers to determine whether JCL, JECL or Cobol statements are syntactically correct and whether the sequence of statements is valid. An invalid statement is highlighted by an error message which precedes the statement in question, the spokesman stated.

Vollie's standard library storage facilities and on-line data entry and editing capabilities are, of course, included with the 2.0 package.

The software is available under permanent license for $11,500; on a monthly basis for $420/mo; and on three- or five-year leases for $371/mo or $305/mo, the ADR spokesman said from Route 206 Center, Princeton, N.J. 08540.

Partition Monitor 'Boosted'

FAIRFIELD, N.J. — The Boost package from Macro 4, Inc. has been described as a partition monitor because it incorporates a method of sharing CPU power between DOS/VS partitions by setting a limit on the amount of continuous CPU time used by any one partition.

Partition monitoring, a continuous process that senses when a high-priority partition has become CPU-bound and is locking out other partitions, can change priorities dynamically to alleviate the blockage, a spokesman said.

This differs from time slicing, for example, which rotates partition priorities according to a preset time interval without considering the characteristics of the jobs, he explained.

Boost has been available for some time but several enhancements now make it more useful than ever, the spokesman continued, citing support for resident transients, a logical transient area (LTA) assist, priority I/O and an interrupt code optimizer as the areas of improvement.

Loading from disk is also greatly reduced and load time of material that must be moved from disk is "dramatically improved," he claimed.

The LTA Assist combines with partition monitoring and the resident transient feature to relieve the problems typically encountered by availability of only one LTA. The Assist gives the partition that has called a Transient top CPU priority until the LTA processing is completed.

The Interrupt Code Optimizer is of particular value to larger systems — with 30 or more devices attached locally.

The enhanced Boost is available for a total of $100/mo on a one-year lease plan, Macro 4 said from Gothic Plaza, 365 Hollywood Ave., Fairfield, N.J. 07006.

'Configurator' Aids DASD Users

SACRAMENTO, Calif. — Users of direct access storage devices (DASD) in IBM-based installations will not have to manually preallocate or reblock space on target devices when moving data sets if they use the Volume Configurator now available from Software Module Marketing (SMM), a spokesman said.

The Configurator system is an optional extension of SMM's DASD Management System (DMS/OS) and is able to provide significant support to users who are "migrating" Physical Sequential, Partition, Indexed Sequential and Direct Access data sets from one type of DASD to another.

Movement, reblocking and reallocation of data sets between various types of real and virtual DASDs is fully automated and under control of user-defined parameters with the Configurator, he said. It eliminates the need for track counting, address conversion and other clerical activities normally required when making such moves, he added.

Because of its reblocking ability, the Configurator does not restrict IBM 3850 mass storage users to certain device types when migrating in and out of the mass storage system.

The basic DMS/OS provides DASD reconfiguration, but requires that packs be dumped to tape prior to being restored to DASD. The Configurator eliminates the need to go to tape, the spokesman continued.

The Volume Configurator allows users the option of basing target allocations on tracks used, rather than tracks allocated for the source data set. The support also enables user programs to request the migration of individual data sets with optional renaming and reblocking with each use, he said.

The Configurator is available for $2,500; it requires the basic DMS/OS software, which costs $12,000, and can be ordered from SMM in the Crocker Bank Bldg. Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

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Cobol Report Writer Practical in Most Uses

By Christopher K. Janisz
Special to CW

Cobol Report Writer has generally been considered a novelty, an elaborate toy unadaptable to the demands of the practical DP world. After five years and 10 installations (as an independent consultant), I have found the utility straightforward and flexible in almost all applications while providing an increase in maintainability and a reduction in software development time.

Report Writer functions are broken down into easily identifiable modules. Regardless of programmer style, modules always perform the same operation, in the same sequence, based on the same conditional branches. From the nature of the reserved words used, modules are somewhat self-documenting and little time is spent determining function.

Usually, the ease of report formatting is acknowledged as the utility's greatest advantage, but I find that its assignments of recognizable functional modules far outweigh any field positioning abilities.

Many people seem to feel Report Writer saves time on simple reporting, but becomes an unwieldy millstone with anything complex. The power of the utility lies not only in repetitive labels (headings, footings, details), but in automatically maintained totals.

Rather than branching and rebranching inside of programmer routines, standard maintenance tasks (updating; resetting, outputting) may be completely eliminated. I believe there is little disagreement with the reduction of programmer responsibilities as a basis for development time optimization.

As an illustration, consider the Cobol source code necessary to produce an inventory report of purchase order line items with the following requirements: all line items are to be summed by part number within department, by department and by division (Figure 1).

Assuming that all data has been sorted (by division, department, part), the logic necessary for the processing of each line item is diagrammed in Figure 2; this entire logic flow can be automatically constructed by Report Writer through little more than an initial description of report line formats (Figure 3), while execution code is reduced to a single GENERATE command.

Regulation of Scheduling

The most difficult concept to appreciate is the regulation of report module scheduling; perhaps the best means of explanation is by a walk-through. Execution of a GENERATE command initiates the following:

1. If the current line count is greater than the specified page limit, a page eject and the page heading are output and the line count is reset.
2. First time through, all CONTROL headings are output (updating line count and initiating all totals).
3. All CONTROL items are checked to see if their values have changed since the last GENERATE (a control break); if so, appropriate CONTROL FOOTINGS followed by CONTROL HEADINGS are output (updating the line count).
4. DETAIL items are output (if specified) and appropriate totals are summed.
5. Last time through (TERMINATE command), all CONTROL FOOTINGS are output.

CONTROL items are both boon and scourge to the applications programmer; when originally defined (eg., CONTROLS ARE CNT1, CNT2, CNT3) a hierarchical structure is identified. A control break on CNT3 would cause a CNT3 footing followed by a CNT3 heading to be output; however, a control break on CNT1 causes all lower level controls (in addition to itself) to breakproducing CNT3 footing, CNT2 footing, CNT1 footing, CNT1 heading, CNT2 heading, and CNT3 heading to be output.

To add to the complication, the example (Figure 3) uses subtotals (department and division) which, for efficiency, are only updated on the control breaks for those levels. No substitute for practical experience can be made here, but the unfamiliar user can easily learn manipulation of these modules by a top-down approach to code development (implementing and testing one module at a time).

Unfortunately, the business programmer may find little time for the learning process, but if structured design concepts and top-down development are adhered to, the initial trial-and-error time loss should be minimal. Certainly, experienced programmers may balk at "abandoning" their own personal methods, but consider the additional time, code and documentation necessary for programmer replacement of the automatic functions.

Report Writer is a powerful utility and, while avoided by analysts in general, is nevertheless an indispensable tool to the data processor.

Janisz is a DPer living in Royal Oak, Mich.

```
DIVISION A1

DEPARTMENT        PART       QUANTITY    VALUE
   TRNP        A73-4601-A      1854     27717.30
   TRNP        A76-4601-B      1071     16525.53
   TRNP        A89-76308       0045      5570.10
               * TOTAL *       2970     49812.93

DEPARTMENT        PART       QUANTITY    VALUE
   DIST        SF-964          1416    114401.68
   DIST        WC-895          0033        53.79
               * TOTAL *       1449    114455.47
               ______________________________

DIVISION TOTAL VALUE:                  164268.40
```

Figure 1

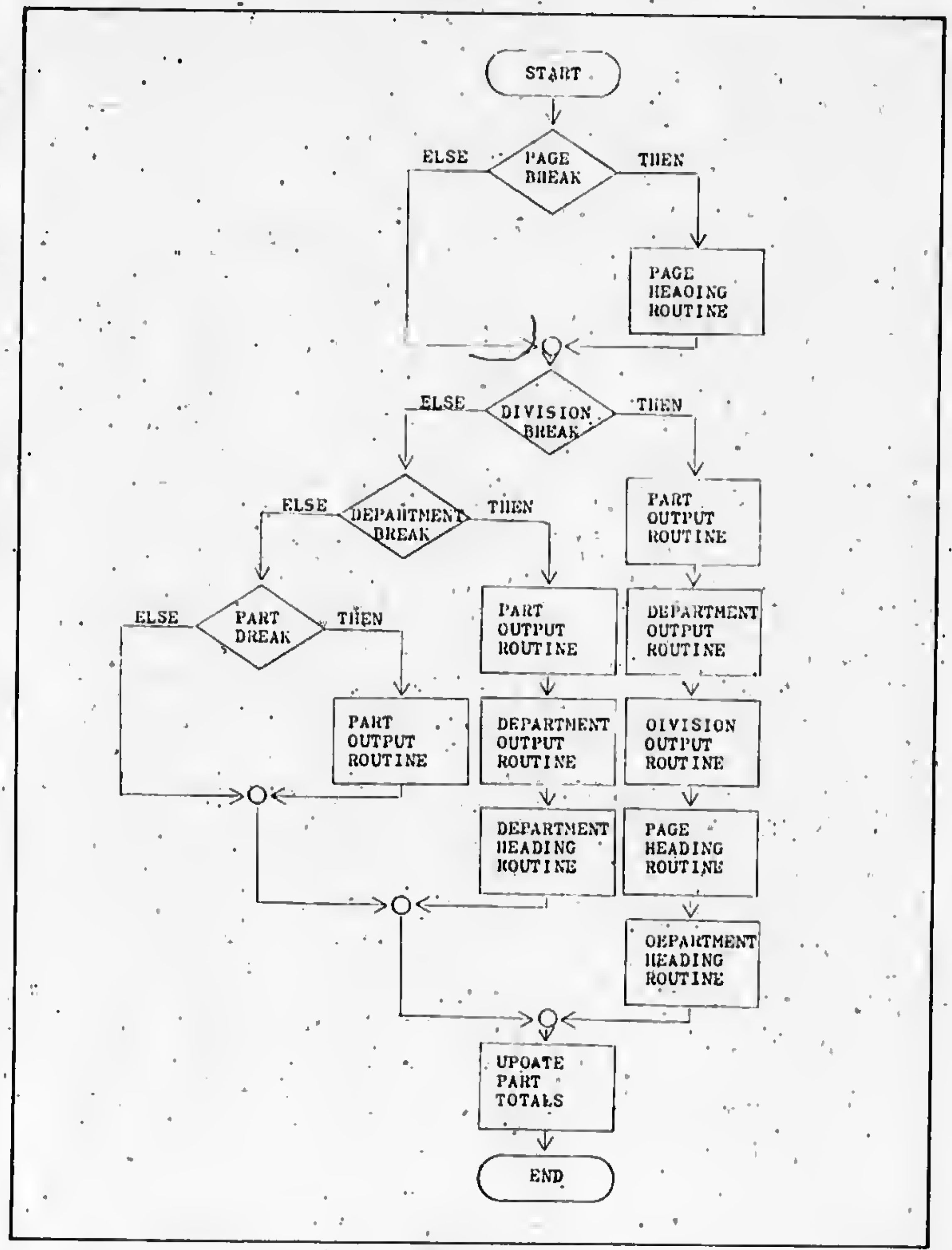

Figure 2

```
000390 REPORT SECTION.
000400 RD   PART-SUMMARY
000410      CONTROLS DIVIZION, DEPARTMENT, PART-NAME
000420      PAGE 60 LINES
000430      FIRST DETAIL 6.
000440 01   TYPE PAGE HEADING.
000450      05   LINE 01.
000460           10   COLUMN 22 PIC X(19)     VALUE   'PART SUMMARY REPORT'.
000470           10   COLUMN 51 PIC X(4)      VALUE   'PAGE'.
000480           10   COLUMN 56 PIC ZZZ9      SOURCE PAGE-COUNTER.
000490      05   LINE PLUS 01.
000500           10   COLUMN 22 PIC X(19)     VALUE   ALL '-'.
000510           10   COLUMN 51 PIC X(4)      VALUE   'DATE'.
000520           10   COLUMN 56 PIC X(8)      SOURCE CURRENT-DATE.
000530      05   LINE PLUS 02.
000540           10   COLUMN 22 PIC X(8)      VALUE   'DIVISION'.
000550           10   COLUMN 31 PIC XX        SOURCE DIVIZION.
000560 01   TYPE CONTROL HEADING DEPARTMENT LINE PLUS 02.
000570           10   COLUMN 22 PIC X(10)     VALUE   'DEPARTMENT'.
000580           10   COLUMN 37 PIC X(4)      VALUE   'PART'.
000590           10   COLUMN 45 PIC X(8)      VALUE   'QUANTITY'.
000600           10   COLUMN 56 PIC X(5)      VALUE   'VALUE'.
000610 01   PART-DETAIL TYPE DETAIL.
000620           10   SOURCE PART-QTY.
000630           10   SOURCE PART-TOTAL.
000640 01   TYPE CONTROL FOOTING PART-NAME LINE PLUS 01.
000650           10   COLUMN 25 PIC X(4)      SOURCE DEPARTMENT.
000660           10   COLUMN 34 PIC X(10)     SOURCE PART-NAME.
000670           10   QUAN-SUB
000680                COLUMN 47 PIC 9(4)      SUM     PART-QTY.
000690           10   VALU-SUB
000700                COLUMN 54 PIC Z(5)9.99 SUM      PART-TOTAL.
000710 01   TYPE CONTROL FOOTING DEPARTMENT LINE PLUS 01.
000720           10   COLUMN 34 PIC X(9)      VALUE   '* TOTAL *'.
000730           10   COLUMN 47 PIC 9(4)      SUM     QUAN-SUB.
000740           10   VALU-TOT
000750                COLUMN 54 PIC Z(5)9.99 SUM      VALU-SUB.
000760 01   TYPE CONTROL FOOTING DIVIZION.
000770      05   LINE PLUS 02.
000780           10   COLUMN 34 PIC X(29)     VALUE   ALL '-'.
000790      05   LINE PLUS 01.
000800           10   COLUMN 22 PIC X(22)     VALUE
000810                'DIVISION TOTAL VALUE:'.
000820           10   COLUMN 54 PIC Z(5)9.99 SUM      VALU-TOT.
```

Figure 3

Utility Produces Code on Series/1

E. PROVIDENCE, R.I. — A user-oriented program-generation package from Span Management Systems, Inc., SRPG/1 generates source-code programs on IBM Series/1 minicomputers with either 4955 A, B, C or D model processors operating under the Span TSS time-sharing operating system.

SRPG/1 is not a language, the firm explained, but a utility program that asks a series of user-answerable questions and generates a program to print data files from user specifications.

The software can produce single-line/record report programs with up to three user-defined detail headings and three user-defined optional report legends, a spokesman explained. The package also generates up to 15 report columns per print line and up to five optional report breaks.

Other features include variable page widths, print-line lengths and page lengths, as well as variable column spacing, the spokesman added.

SRPG/1 requires 64K of memory and costs $2,500 per machine. Span's time-sharing operating system (TSS), a prerequisite for SRPG/1, costs $5,000, the spokesman said from the company's Series/1 Division on Vision Blvd., E. Providence, R.I. 02914.

Repertoire of 30 Commands

Corporate Tax System Provided on Remote Net

LOS ANGELES — Corptax, a product of Financial Decision Systems, Inc. (FDS), is an on-line corporate tax system now available on the Interactive Data Corp. remote computing network.

With a repertoire of 30 commands, the system is said to provide a complete compliance service which prepares all corporate, state and local, combined, consolidated and separate income and franchise returns for multistate and multiunit corporations.

Data can be taken from the user's source documents from general ledger magnetic tapes or, presumably, disk-based files, eliminating the transfer of data onto input forms — a step that is recognized as error-prone, according to an FDS spokeswoman.

Trial balances, audit trails and adjustment worksheets are produced as initial output of the system. Adjustments, eliminations and information for the government's Schedule M are then entered through the terminal; tax calculations are made immediately and either the bottom line or final returns are produced, she noted.

Since the system is maintained in a central location, changes required by enactment of new laws or promulgation of new regulations can be implemented with relative ease by the vendor. Discussion of other changes takes place at a national, annual user group meeting, the spokeswoman said.

There is a $2,000 start-up fee for using Corptax, but after that normal Interactive Data Corp. rates apply, including a $35/mo minimum charge when applicable, she noted in conclusion from FDS's offices in Suite 1715, One Wilshire Blvd., Los Angeles, Calif. 90017.

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DISK DRIVE MODEL: ____________ LANGUAGES USED: ____________

'Autotab II' Now Includes Graphing, Display Abilities

PHOENIX — Capex Corp. has announced an enhancement to its Autotab II financial planning, forecasting and reporting system that is said to improve the software's flexibility in both commercial time-sharing and in-house environments.

Autotab II supports the DP novice as well as the experienced programmer in report preparation, a spokesman noted. The package provides all standard arithmetic functions (incuding square root and exponentiation) and related facilities such as summing, averaging and accumulating of specified fields, he said.

A "what-if" facility, also built in, simplifies evaluating sets of assumptions by reviewing up to 40 alternatives at one time, the spokesman added.

Release 4.0, like the previous version, is designed for use on IBM 360/370s operating in OS, VS and CMS environments.

The upgraded package incorporates a graphing facility capable of producing three types of histograms and generating any number of graphs in a single execution, according to the spokesman.

Autotab's restructured Call facility reportedly allows greater data transmission to and from Cobol or Fortran subroutines, and several other software additions are planned which will furnish the user with an extended range of depreciation, amortization and forecasting capabilities, the spokesman continued.

The package sells for a one-time fee of $14,450 or can be leased for $575/mo under an annual arrangement. Additional information on Release 4.0 is available from Capex at 2613 N. Third St., Phoenix, Ariz. 85004.

Dearborn Offers 'SIM-14' Update

PARK RIDGE, Ill. — Version 4 of SIM-14, the software package that allows programs developed on IBM 1401, 1440 and 1460 CPUs to run on state-of-the-art IBM or compatible hardware without reprogramming, has been released by Dearborn Co.

A Dearborn spokesman explained the rationale behind SIM-14. Users with second-generation programs can reprogram to run on the improved hardware now available, or they can use SIM-14. IBM 30 Series and compatible CPUs such as Control Data Corp.'s Omega 480, Itel Corp.'s AS/6 and Amdahl Corp.'s 470s simply do not contain emulation for 1400 Series programs.

SIM-14 not only supports code, probably written originally in SPS or Autocoder, but 1400 utilities and sort replacements as well, the spokesman said. The Dearborn package creates self-relocating problem programs and allows multiprogramming.

The Dearborn-provided environment supports all tape and disk devices including IBM 3350s and has no hardware restriction other than availability of the decimal arithmetic set.

SIM-14 costs $15,570 on a permanent license and monthly license plans are also available, the spokesman noted from Suite 400, 1460 Renaissance Drive, Park Ridge, Ill. 60068.

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'In-School' System Speeds Grade Reporting

By Tim Scannell
CW Staff

BROOKFIELD, Conn. — Being human, the average high school student doesn't look forward to getting a report card, especially if it includes bad news about his work. A local school's use of an in-house computerized grade reporting system makes academic scoring, if not a little less painful, at least a lot more timely than it has been in the past.

Brookfield Secondary School has approximately 1,350 pupils and until recently has relied on an outside service bureau to process each student's grades and determine academic standings. Teachers and school officials would fill out mark-sense cards indicating a student's academic progress, send the cards to the bureau to be processed and eventually receive a batch of completed report cards.

This relationship with the service bureau was fine, except it sometimes took more than 10 days from the time a student's grades were closed until the good or bad news was mailed from the school, James Chittum, dean of grades 8-10, stated.

Under the new system, grades, final reporting scores and even attendance records are processed by a Wang Laboratories, Inc. Model 2200 16K minicomputer purchased by the school's math department. "We increased the memory and added a high-speed printer . . . so that we actually bought more hardware in order to handle the in-house grade reporting system," Chittum explained.

The grade reporting software system, developed by Compleat Computer Solutions (CCS) handles a maximum of 1,500 students and maintains course files, instructor and student files, grade verification lists, quarterly ranks and up to four quarters of cumulative information. An optional attendance system, also developed by the firm, tracks absent/tardy figures and maintains student attendance information on a daily basis, a company spokesman said.

Besides reducing the average report turnaround time from almost two weeks to five or six working days, the system also allows more control over academic input. "We can have an edit or proof done as the cards come in and have the teachers immediately look for any errors they've made and change the cards before they're processed for reports," Chittum continued.

Number of Alterations

A number of alterations were made on the original software system both to improve its flexibility and to "shake out some of the bugs," Chittum noted. Programs were restructured to run faster and storage formats were rewitten to reduce the number of disk packs needed for a complete academic run. "CCS . . . squeezed things down in the file so that we got it all on two disks, whereas before we had to have a separate disk for each of the eight classes."

Brookfield also had a few minor difficulties handling the increased flood of mark-sense and punched cards. "We had been going with a card/computerized grade reporting system for three years before we started this one," Chittum continued, so the teachers had no problems dealing with the reporting method itself.

However, the teaching staff did have a hard time reading and marking the CSS cards, Chittum stated, "because they're used to writing on pieces of paper rather than on cards. Not only were the cards small, the color used for printing on them was hard to read "so we changed the color and shaded some columns to eliminate the problem."

Chittum observed that the entire system, including the software, hardware and various peripherals, is a "very expensive" proposition if approached from "scratch." In fact, he added, Brookfield probably would have voted against the present system if the school had not already purchased all of the hardware for instructional purposes.

The attendance and reporting software system, including installation, documentation and training, cost the school roughly $3,000, Chittum pointed out. "After this initial charge . . . the school merely pays for cards and paper plus . . . a clerk to run the system."

Since the software is tailor-made for the school's Wang configuration, the system has run virtually trouble-free, Chittum commented. "As it stands right now, the software has the capability of doing anything we want it to."

Print Utility Suits DOS/VS

ALTA LOMA, Calif. — Described as complementing the facilities of disk space allocation programs and improving the process of verifying test results, a utility package is now available from Efficiency Systems to print any data set in IBM DOS or DOS/VS.

With the software, any number of tape or disk data sets can be printed in a single execution, a spokesman said. The files can be sequential or indexed sequential on "any DOS/VS-supported device," he added.

Report data sets can be printed using embedded carriage control information, and records within a data set can be selectively printed. Each print control statement may be conditioned by up to eight record or range selections.

The utility runs in 32K, costs $500 and can be ordered from 8759 Hillside Road, Alta Loma, Calif. 91701.

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Meet to Focus On Data Banks

ALBUQUERQUE, N.M. – The Government-Industry Data Exchange Program (Gidep) has completed plans for a workshop on specialized data banks and communications network, to be held at the Four Seasons Motor Inn here Oct. 31-Nov. 2.

The session is intended for both government and industry representatives and will include seminars on Gidep data banks, computer and microform data retrieval equipment and techniques, and an orientation for new participants. The workshop is free to Gidep members; more information is available from the Gidep Operations Center, Corona, Calif. 91720.

Keeping Users in Mind

Documentation Requires Detail

By Richard Zaneski
Special to CW

A successful operations department needs current and well-organized program documentation. Without it, operators and DP staff personnel lose sight of many details essential to a successful computer operation.

Concepts and Techniques

Detailed program documentation has become vital with the advent of more sophisticated software and hardware. DP managers must recognize this fact and change their philosophies.

To initiate a meaningful documentation program, DP managers must select professionals who are technically competent and able to write clearly. In most cases, these people will face a complex, time-consuming and exasperating job. The end result, however, will be well worth the effort, if enough planning and research is done. The writer's initial task requires the preparation of documentation standards on a programming level. Formalized standards will establish the basic writing format and documentation complexity.

When writing program documentation, consider the needs of the personnel using the material. It should be geared for operators in the machine room and written at their level of use. However, it can be a valuable tool for the programming staff and new personnel in understanding programs and their relationship to each other.

In addition, consider the computer environment. All program documentation must reflect the operating system environment.

If the machine room operates in IBM's DOS environment, for example, prepare individual program write-ups in three sections. The first section should contain the following data:

- **Program function.** Write a functional description of the program. For example: "This program produces the trial balance report and updates the accepted transactions file.
- **Input file identification.** List all files that enter the program.
- **Output file identification.** List all files the program produces.
- **Input/output file identification.** List all files, such as work or sort files, that service the program.
- **Output report identification.** List all reports the program generates.
- **Run frequency.** Indicate the program's frequency. For example: "This program is run on the 15th of the month."
- **Program logic narrative.** Describe the actual program logic flow. The description should contain enough detail to help a programmer or operator understand the processing cycle.
- **Control card formats.** Show any control card data using a tabular format. Column headings must include the first and last column numbers of each field, fields lengths and field descriptions that include all possible code values.

The second section of the DOS program write-up provides more specific data for an operator, as follows:

- **Core required.** Show the amount of core the program uses.
- **Estimated run time.** Indicate the approximate program run time.
- **File use.** List each file and its logical identification.

Additional information should include the file status (whether it is input, output or I/O) and the device type used (such as tape or disk).

- Printer type. If reports are printed, note the type of printer used.
- **Carriage tape/forms.** List any special carriage tape and form. If normal computer paper is used, indicate the number of copies that will be printed. For example:
  1. Fargo long carriage tape.
  2. Standard three-part (11-in. by 14-in.) stock form.
- Console messages and action required. List all messages exactly as they appear on the console. Adjacent to each message, provide any corrective action that must be performed. If no messages appear, indicate this fact.

Third Section

The third section of a DOS program write-up contains the program flowchart and most current job control language. As a general rule, show the source and destination of each file on the flowchart.

Ensure that all file, report and program names are consistent with the program documentation text. The basic precaution establishes a continu-

(Continued on Page 40)

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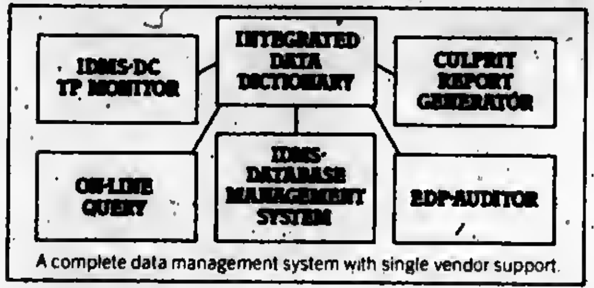

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If you have an IBM 360, 370 or 303X computer and would like to see what IDMS can do for you, write or call Cullinane Corporation, 20 William St., Wellesley, Mass. 02181, (617) 237-6600.

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Transaction Applications Backed

NEW YORK – An outgrowth of the Decision Strategy Corp. Terminal Application Processing System, the Taps Transaction Processor (TTP) from Decision is said to be a "complete environment for developing transaction-based applications" that can be used on IBM 360/370s or a variety of microcomputers.

Users build transactions interactively from a CRT – screens are laid out, transaction controls specified and data bases described through the keyboard. TTP provides security, menus, editing, temporary data storage, data collection, network and data base recovery, a spokesman said.

The system also supports data paging, documentation, terminal operator control and accumulation of statistics, he said, adding that users need only code for logical comparisons and computations.

TTP interfaces with any communications monitor or provides its own. It also interfaces with "all terminal types," he continued. The code, written in a high-level language, is "90+% portable" amongst IBM mainframes and minis from Digital Equipment Corp., Hewlett-Packard Co., Interdata, Tandem Computers, Inc. and IBM, he said.

TTP is available for $25,000, with discounts applicable for multiple installations within the same organizations. The vendor is at 708 Third Ave., New York, N.Y. 10017.

Good Documentation Needs Detailed, Orderly Approach

(Continued from Page 38)

ity between individual program write-ups and assists personnel in working with the program.

If documentation is geared for an OS environment, observe all steps used in preparing DOS program write-ups. However, ensure that the second section of the OS program write-up contains the following changes:

- In place of the "file use section" and its associated information, list each DDNAME (data description card name) and DSNAME (data set name). Adjacent to the DSNAME, indicate the unit type involved and its disposition.
- In place of the "carriage tape/forms section," identify the carriage tape/-forms control buffer. Normally the forms control buffer takes the place of a carriage tape for a high-speed printer. It is part of the control unit that serves as an interface between the system and printer.

If a low-speed printer is used, the carriage tape will be used and should be identified.

- The printer type should not be shown.
- If any console messages appear, list them.

After Completion

After completing a DOS or OS program write-up, number each page (Page 1 of 4, Page 2 of 4 and so on). Odd-numbered pages must have the page number typed in the lower right-hand corner. Even-numbered pages must have the page number typed in the lower left-hand corner.

After all principal users approve the program write-up, copies of the pages can be encased in protective plastic sheets using a back-to-back configuration. In this manner, page numbers will appear by the outer margin of the pages.

At this point, all program write-ups can be placed in individual binders by system in their operational sequence. In turn, each documented system must have a table of contents and list of effective pages. These introductory pages must show the program names in their proper order, number of pages in each program write-up and change numbers with approval dates, if applicable.

Even with slightly different requirements, each DOS or OS program write-up must be a self-contained unit reflecting all operational needs. This modular approach provides an efficient means of maintaining the program documentation and making the writer's job easier.

Packages Aimed At APL Uses

TORONTO – Numetrix Ltd. has released two application packages designed to run under most APL implementations including VSAPL and APL SV for IBM equipment and APL running on Digital Equipment Corp. and Hewlett-Packard Co. machines.

The first package, Conversational Terminal Input (CTI), was designed as a standard utility to handle all prompting transactions between an APL program and its user, a spokesman said. CTI reportedly supplies user-oriented code for man-machine interaction and reduces the effort required for applications consisting of conversational I/O.

The second package, Analyst, is appropriate for any user who needs to extract data from a data base, manipulate the data and print the results utilizing a flexible report generator.

CTI can be leased for $100/mo for the first year, after which no further charges are made, and Analyst is available for $300/mo for the first two years with no added charges, the spokesman said from Suite 600, 3 Church St., Toronto, Ont., Canada M5E 1M2.

Suffering from system hang-up? DOCS-Display Operator Console Support has the cure...

The hang-ups in most IBM S/360 and S/370 systems are directly related to the system console functions whether the native console is a typewriter or a display unit. **DOCS** permits the entire system to approach its full potential. Here's why:

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Conventional DOS and DOS/VS allow only single thread console activity.	DOCS permits concurrent console activity including Multiple Outstanding Reads.
The system hangs up when the conventional console device becomes inoperable.	DOCS allows the system to continue to write messages to the CRT thereby allowing the CPU to keep on running.
Someone needs a copy of SYSLOG data for a job being run.	DOCS provides all SYSLOG data in any or all of three ways: 1) Trickle hard copy to a typewriter or 3270 type printer. 2) All SYSLOG data can be printed on SYSLST at end of job time. 3) DOCSLIST provides a time-stamped archival listing of all SYSLOG data.
Operators don't know the current status of the system.	DOCS Dynamic System Status Display details job names and program names which are currently running as well as those that are waiting and the resource they are waiting for.
DOS and DOS/VS support only one console.	DOCS supports multiple consoles.

ICP Million Dollar Club

DOCS will run on both S/360, S/370, and 3031 DOS and DOS/VS and give added support beyond that provided by the IBM program products on the S/370/138, 148, and 158 CPUs.

DOCS will run along with other spooling or control packages such as EDOS, GRASP, GRASP/VS, DOS/RS, POWER II, ASAP, ASAP/VS, POWER/VS, ITEL's DOS/VS, and DOS/MVT.

DOCS is available from C F S, Inc as a licensed program product and may be leased monthly, yearly or on a one-time lease arrangement for $175.00, $1,890.00 and $5,670.00, respectively. All three plans include free maintenance for as long as DOCS is installed.

Send requests for DOCS to C F S. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:

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1330 Boylston Street, Suite 608
Chestnut Hill,
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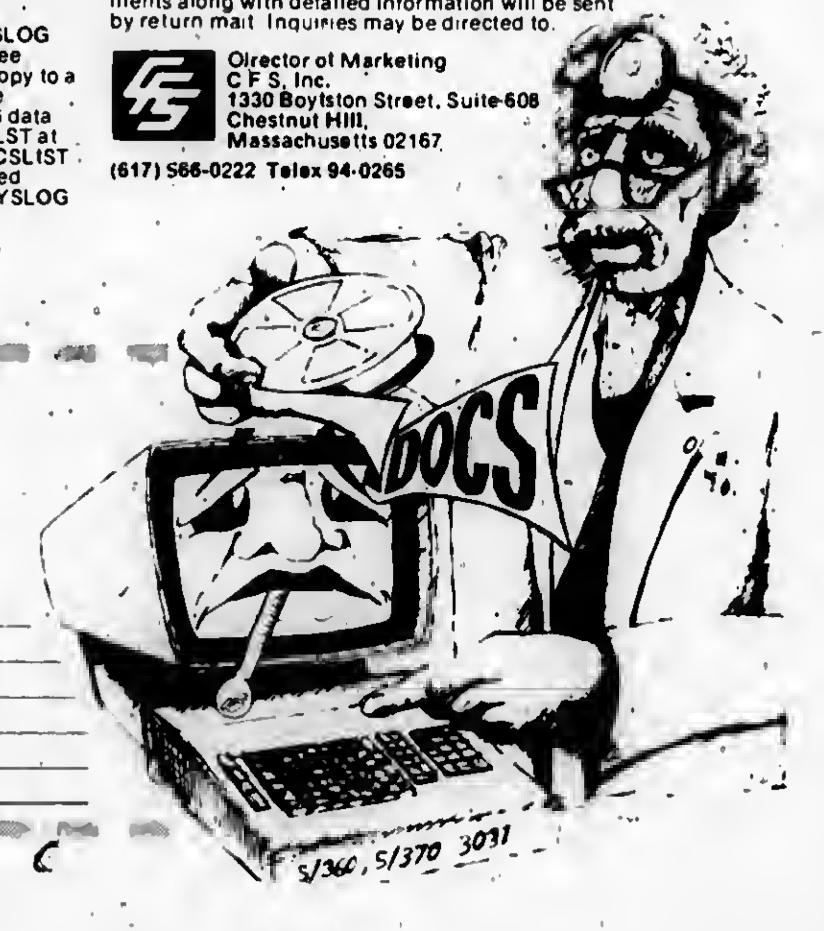

Mixes Circuit, Packet Switching

Japanese Show Off Interuniversity Net

By Ronald A. Frank
CW Staff

KYOTO, Japan — An on-line demonstration of an experimental interuniversity communications network was provided for delegates to the recent International Conference on Computer Communication, with simulations of time-sharing and remote job entry (RJE) services.

The demonstration was conducted at Kyoto University, where the experimental N-1 network has been undergoing field trials since mid-1976. The N-1 network links Kyoto University's DP center with the DP center at Tokyo University using facilities that will become part of the DDX-2 switched digital data network being configured by the Nippon Telegraph and Telephone Co.

The field trials are testing the feasibility of linking seven University computer centers in Japan by using both circuit-switched and packet-switched lines that will be part of the DDX-2 network.

Long-haul facilities in the N-1 network include 48K bit/sec lines connecting a Facom M-190 mainframe at the Kyoto University DP center with a Hitac 8800/8700 CPU at Tokyo University supplied by Hitachi Ltd.

Circuit-switched facilities are used for load leveling, RJE, file transfers and real-time processing. The packet-switched lines are used for time-sharing, on-line file access and other interactive uses, according to Hajime Kitagawa, associate professor of DP at the Kyoto University installation.

Network Details

About 130 remote terminals at Kyoto and 350 at Tokyo are connected to the N-1 network. Terminal control at Kyoto is handled by Facom F2805 communications control processors, described as similar to the IBM 3705 front end.

Time-sharing terminals operate at 50-, 300- and 1,200 bit/sec while remote batching stations transmit at speeds ranging from 1,200- to 9,600 bit/sec.

Several CCITT-standard protocols are employed in the network; the packet-switched service utilizes the X.25 standard. A Network Virtual Terminal (NVT) protocol is used which includes functions similar to those of the U.S. Arpanet and Telenet Service.

The Facom M-190 uses the OSIV/F4 operating system, described by Kitagawa as similar in capabilities to IBM's MVS. The mainframe includes 6M bytes of main memory along with a cache memory of 16K bytes.

The machine is faster than a comparable IBM, 370/168 and is about equal to an Amdahl Corp. 470 mainframe, Kitagawa said.

Unusual Printer Site

The Kyoto Center has an unusual output printer installation. It includes four high-speed printers operating at speeds up to 2,000 line/min.

Output jobs are run through an automatic paper cutter that separates the printout from the continuous form paper and carries it to a conveyor belt. From there it is carried to a rotating carousel, resembling the devices found in baggage claim areas of airports, from which graduate students and other users collect their completed printouts.

Among the N-1 network services shown during the demonstration were the TSS time-sharing service. The Tool-IR information retrieval service and RJE capabilities that provide self-service input to authorized users.

Optimization Service Designed To Lop 30% Off Telephone Bills

By Brad Schultz
CW Staff

CAMBRIDGE, Mass. — A service designed for firms whose annual telephone bills exceed $200,000 reportedly cuts those bills 30% and enhances telecommunications management.

The service "provides the ability to report on all telephone calls from each extension, [noting] their cost and to whom they are made," according to a spokesmen for the vendor, Index Systems, Inc.

From a detailed "telephone bill" generated for each extension, management has an accounting of the number, length and cost of all calls and whether they were business-related, he explained.

Other reports show expenses by division, department and company totals, "with all information for determining quickly if costs are reasonable and within [the] budget."

"One of the key benefits of the service is that it gives a company the tools to ensure the most cost-effective network for its particular needs," the spokesman said.

Special reports identify heavy calling areas and the potential of Wats, Tie and Foreign Exchange (FX) lines. "This data is run through an optimizer [at the Index facility] which determines...the best combination of lines, available features and grade of service from a standpoint of cost and usage," he noted.

The optimization methodology consists of three steps: call pricing, cost/savings comparison and truck activity/savings. After these steps are completed, the possible combinations of Wats/FX/Tie circuits are determined through Cobol programs Index has developed and runs on a time-shared IBM, 370 configuration.

Three Steps

In call pricing, "all Wats and private line calls in the input data base are priced out as if they had been originally carried on the Direct Distance Dialing [DDD] network," the spokesman explained. "This step places all calls on a common footing so parametric analyses of savings comparisons performed in later steps can be realistic and accurate."

Index maintains a file of the location of each of the 35,000 Bell System rate centers in the U.S. This file, together with programs utilizing Bell System distance calculation algorithms and both inter- and intrastate message pricing tariffs, yield the DDD prices for each call.

During the cost/savings comparison step, the priced-out traffic parcels are entered recursively into a series of statistical programs which construct and evaluate a range of Wats configurations. "The overall systems evaluation of the output of these programs is accomplished by Index consultants," the

(Continued on Page 42)

Is DES Best Net Security?

Much controversy has surrounded the development and implementation of the federal Data Encryption Standard (DES).

Proponents say it is the premier form of data protection for both commercial and government network applications; its critics claim the standard is vulnerable to penetration in certain environments. Some have even charged that the IBM-developed and National Security Agency-sanctioned algorithm has been rigged for clandestine access and thus poses a privacy threat [CW, Jan. 30].

Computerworld is planning a series of articles on this controversy and wants to know what you think about the DES. Send your opinions to Brad Schultz, *Computerworld*, 797 Washington St., Newton, Mass. 02160. Requests for anonymity will be honored.

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Graphics Terminal Features Refreshed Display

NEEDHAM HEIGHTS, Mass. — The Imlac Corp. Dynagraphic Series Model 3205 interactive graphics terminal features refreshed display, software support for host CPU and terminal and a choice of light pen or joystick.

The terminal's support software in conjunction with an optional host/terminal Fortran library can allow users to generate and interact effectively with complex graphic/-alphanumeric displays, employing Fortran calls for applications, Imlac said.

The Dynagraphic terminal is compatible with host CPUs such as the Prime Computer, Inc. 500, Data General Corp. Nova and Digital Equipment Corp. PDP-11, the firm said.

The Model 3205 is said to permit modification or partial erasure of images during interaction without a need for redrawing the entire picture, as required with storage tube systems.

The Model 3205 comes with 16K words of semiconductor memory, a 19-in. refreshed image CRT and a 92-key keyboard with 16 lighted function keys. Dual processors in the unit provide dedicated support for both the CRT and user interaction, respectively.

The terminal costs $14,750, Imlac said from 150 A St., Needham Heights, Mass. 02194.

Service Reduces Telephone Bills

(Continued from Page 41)

spokesman said. "The cost/-savings comparisons developed at each stage must be analyzed manually to select a set of configurations that merit further analysis.

The final optimization step consists of computerized call-by-call simulations of each of the near-optimal Wats configurations and alternate trunking rules discovered in the preceding step. The trunk activity/savings procedure is said to eliminate any errors introduced by statistical approximation.

"We can determine exactly what the trunk activity and consequent savings would have been if each test solution had actually been implemented during the study period," according to the spokesman. "The communications consultant again enters the scene at this stage because the least expensive solution is not always the best one. This 'sensitivity' yields a solution that will be relatively stable in a specific client's environment," he said.

Mini Vantage

According to Index Systems, many companies do not fully appreciate the latest technological advances in telecommunications and the expanding number of sources for switching, station and control equipment. In particular, the firm noted, solid-state equipment based on minicomputers can now provide "more efficient and versatile capabilities at lower cost."

Aside from the IBM, 370-based optimization software, Index employs an inhouse Digital Equipment Corp. PDP-11/70 with a 128K-word memory, Basic Plus, Fortram and the RSTS/E operating system.

Current users of the service include Citibank, Bank of America and the First National Bank of Chicago, Index Systems said.

The service cost cannot be generalized since it depends on each client's specific environment, the firm noted. To date, fees have reportedly ranged from $5,000 to $150,000.

Index Systems is at One Broadway, Cambridge, Mass. 02142.

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Portable Terminal/Scanner Works Over Phone

CEDAR RAPIDS, Iowa — A hand-held microprocessor-controlled terminal designed to provide a two-way link with host CPUs has been introduced by Norand Corp.

The Norand 101 is programmable to allow tailoring according to user needs. The device, which includes a wand scanner, can use any telephone to communicate with a central CPU, extending managerial control into the field, according to a Norand spokesman.

The Norand 101 employs a keyboard of 20 keys and rechargeable batteries to guide the operator through program sequences.

For Most Mainframes

The device is said to be suitable for most mainframes and to provide error-free transmission. It can receive as well as transmit data with its solid-state memory ranging from 16K to 64K characters.

The Norand 101 measures 1.53- by 3.34- by 7.22 in.; the complete terminal, including batteries, memory and communications adapter (battery charger), weighs about 1 lb 6 oz.

The standard unit features 2K (8-bit) bytes of programmable read-only memory (Prom) and 16K (4-bit) bytes of random-access memory. Six two-position switches are featured for program control and two switches effect power on/off.

The interface's 15-pin connector is said to conform to EIA standards for the connection of external devices such as adapters.

Battery Life

The removable, rechargeable batteries have an operation life of about 10 hours and require a recharge time of five hours, the spokesman said. Reliability is rated at 2,500 hours mean time before failure, he added.

The Norand 101 transmits data at 1,200 bit/sec in simplex mode with reverse channel, error-correction capability and optional auto-answer.

Alternately, it can function in half-duplex transmit/receive mode at 1,200 bit/sec with integral battery charger and optional auto-answer. The acoustic coupler functions in simplex mode at 300 bit/sec.

The single-quantity price of the Norand 101 is $1,150. In quantities of 25 to 50, it costs $1,095 per unit; orders of 51 to 100 units cost $1,020 each; 101- to 500-unit orders cost $990 each; orders of more than 500 units cost $890 each.

Optional scanning gear for bar coding reading is available with 2K of Prom for $600, Norand said from 550 Second St. S.E., Cedar Rapids, Iowa 52402.

Processor Links CPUs, Terminals To TWX, Telex

CLIFTON, N.J. — High-speed mainframes and terminals can communicate with the low-speed TWX and Telex networks using Utec Corp.'s Microline communications processor.

Interface conversion is provided between an RS-232 port and the Telex line adapter or TWX access arrangement supplied by Western Union Telegraph Co.

The Microline performs automatic dialing and call routines. Its buffer memory compensates for speed differences, Utec said, allowing the RS-232 device to converse in 8-level Ascii code at 110 bit/sec with the Telex network, which uses the 5-level Baudot code at 50 bit/sec.

Character expansion is generated where needed in order to make the two codes interchangeable, a spokesman noted.

The Telex-compatible version of Microline costs $3,000 while the TWX-compatible version costs $3,750, the firm said from 871 Allwood Road, Clifton, N.J. 07012.

Most engineers and scientists will find all the power they need in this new leader of the HP 1000 family. A new floating point processor handles big data arrays and cuts lengthy computational problems down to size. And the HP 1000 Model 45 also has the flexibility for complex measurement and control applications, for data base management and distributed networking.

And it isn't hard to get your hands on all this computational power. System prices start at just $46,500.*

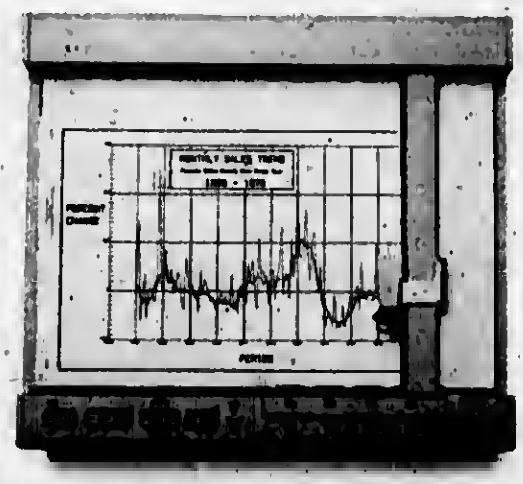
Our new F-Series processor is the hard-working heart of the system. It's extremely fast, completing load and store operations in 900 nanoseconds. The separate hardware processor does floating point calculations at high speeds, too—630 ns for add, 1.8 microseconds for multiply and 3 microseconds for divide.

A special scientific instruction set, standard in the system, also helps to improve execution speed, performing trig and log functions in less than 48 microseconds. And a fast FORTRAN processor, which handles commonly used FORTRAN operations in hardware, also gets things done in a hurry.

Our RTE-IV real-time operating system, the latest in an upward compatible family, lets you manipulate data arrays up to 1.8M bytes, using simple FORTRAN commands. As many as 64 partitions, with a program capacity of 54K bytes, can be resident in memory at the same time.

The HP 1000 Model 45 comes with a fast (25 msec seek time) 20M byte disc drive and an HP 2648A Graphics Terminal, as well as our new Graphics/1000 support software to help you write graphics programs. You can also team it up with other HP products like the HP 9872A four-color plotter and the HP 7245A printer/plotter.

Adding data base management is as simple and economical as adding peripherals. Our IMAGE/1000 software will consolidate your technical information into related and easily accessible files. And you can pool data from other HP 1000 systems (as well as linking to our powerful HP 3000 general purpose computers and IBM) with the help of DS/1000 networking software.



In addition to getting graphic displays on the 2648A terminal, you can get hard copy graphics on our new 9872A programmable four-color plotter, one of many options available with the HP 1000 Model 45. It has a built-in microprocessor and operates up to 360 mm/s (14 inches/s) on each axis. Ideal for vector analysis trace differentiations and window plotting.

So if you've got some big jobs to do, but don't have a big budget to match, the HP 1000 Model 45 can solve your problems fast. To find out all about it, call the HP office listed in the White Pages. Or send us the coupon. We'll prove once again that good things do come in small packages.

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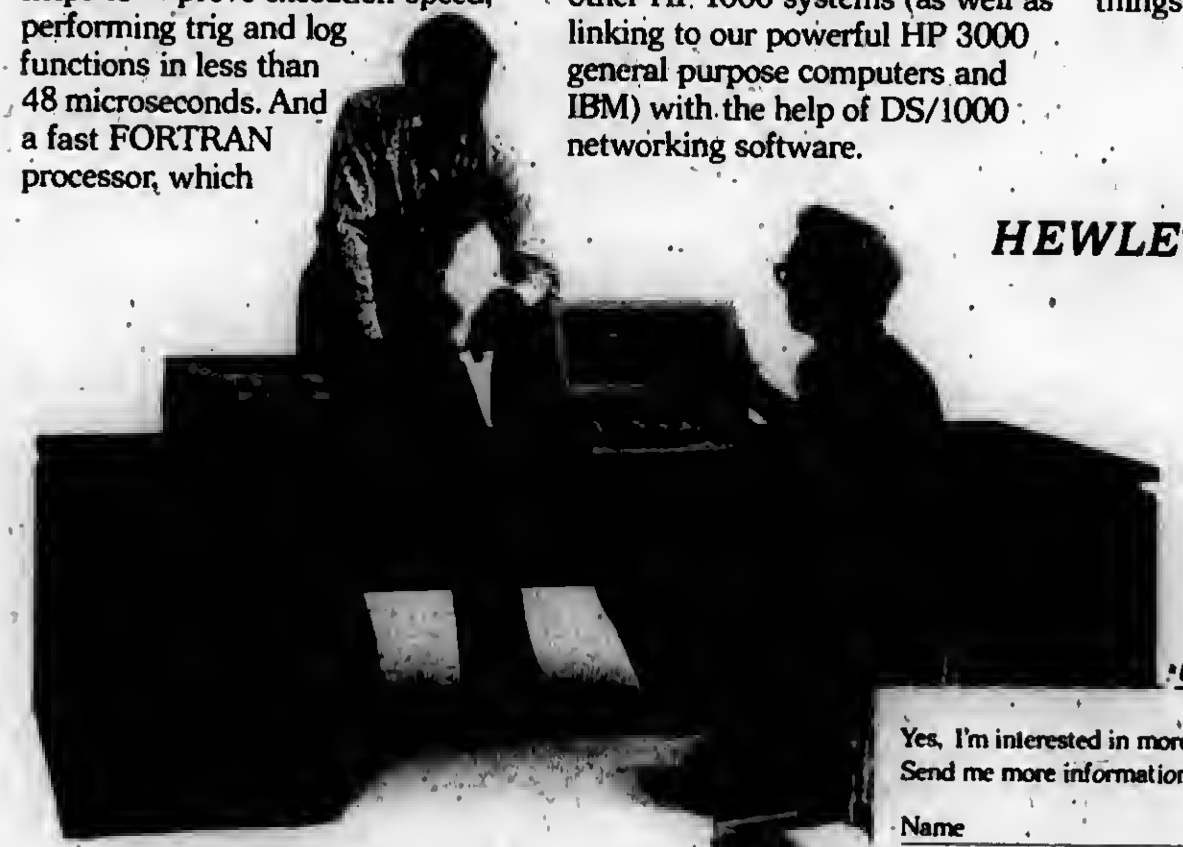

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Telemetry Meeting Planned

SARASOTA, Fla. — The International Foundation for Telemetering will hold the 1978 International Telemetry Conference in Los Angeles Nov. 14-16. The conference theme will be "Expanding Frontiers of Telemetry and Telecommunications."

A variety of product exhibits, talks and technical sessions will be featured, including a keynote address by Dr. Neil Burch of the Office of the Secretary of Defense.

Admission to all events and a copy of the conference proceedings are covered by the $50 general registration fee. Admission to student technical sessions without receipt of the proceedings costs $7.50, while admission to any or all tutorial sessions costs $10. There is no charge for attending the exhibits, and lunch with the keynote address is available free to the first 200 registrants.

Further information on the conference at the Hyatt House Hotel near Los Angeles International Airport is available from Shelby Bass, EMR Telemetry, P.O. Box 3041, Sarasota, Fla 33578.

Paper Dissects U.S. Policy

CAMBRIDGE, Mass. — Just where does the U.S. stand with regard to the international communication of information?

The title of a just-released paper on that subject — "Rethinking International Communications" by William Read — suggests that U.S. policy is due for reevaluation.

The paper is said to identify a set of leading policy problems "in which more is at stake than just the parochial interests of [communications] producers and suppliers." Three leading elements of what might be called "information relations" are reportedly identified as satellites, news and knowhow.

The 19-page paper costs $23.40 from the Harvard University Program on Information Resources Policy, 200 Aiken, Cambrige, Mass. 02138.

ECR Designed For Retailers

MAYNARD, Mass. — An electronic cash register (ECR) designed specifically for small retailers and large chain retailers who need a basic ECR for various in-store departments has been introduced here by Data Terminal Systems, Inc. (DTS).

The microprocessor-controlled unit, designated the Model 150, features 4K read-only memory and 64 random-access memory locations, the company said.

The Model 150 reportedly offers optional backup battery operation, validation printing to cancel checks automatically, automatic tax calculation and the ability to provide 15 totals including up to six merchandise departments.

The ECR costs $795 from DTS at 124 Acton St., Maynard, Mass. 01754.

System Aids Net Configuration

BETHESDA, Md. — Scientific Time-Sharing Corp.'s Aries circuit optimizing system is said to facilitate the configuring of private-line networks by identifying which cities are zoned.

"Not only is it [normally] hard to tell which zones of a zoned city a circuit involves, but there are also special rules that apply," a company source explained.

"Under AT&T's Multischedule Private-Line Tariff for voice-grade interstate lines, a two-point circuit involving a zoned city is priced first by measuring the mileage between Zone 1 of the zoned city and the other point in the circuit. If the mileage is more than 40 miles, the circuit is priced from Zone 1. Otherwise, the circuit will be priced from the zone in which the circuit terminates."

But using Aries, these difficulties are resolved, the source said. Zoned cities are identified by entering an area code/exchange — for example, 301-657 — or a city name — such as PHILADELPHIA/3,PA.

Aries will configure any circuit involving a zoned city to take into account any special rules, the source said.

Typical Aries circuits cost $6, the firm noted, pointing out that further information is available from Robert Ellis of Scientific Time-Sharing Corp., 7316 Wisconsin Ave., Bethesda, Md. 20014.

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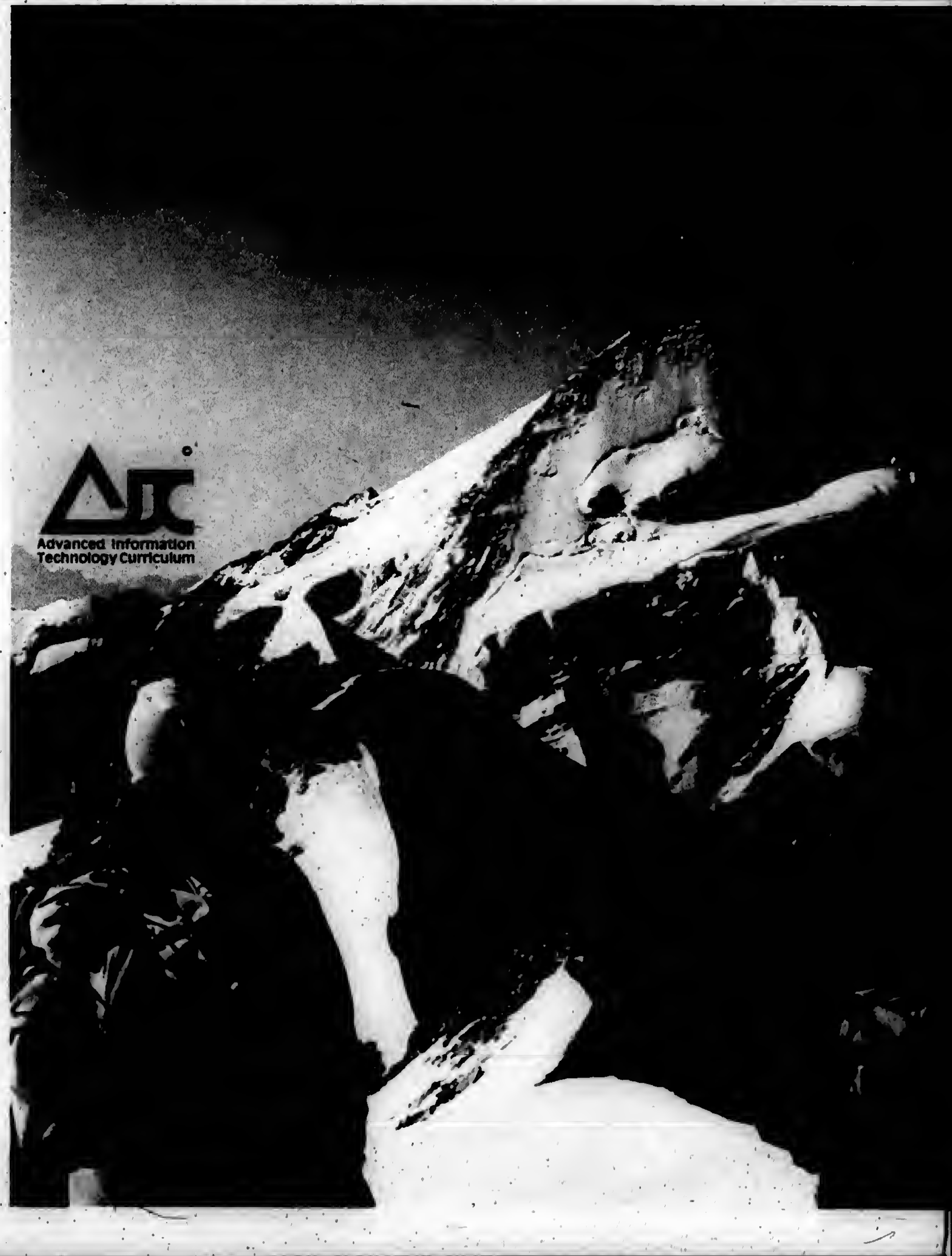

Graphic Sciences Introduces Facsimile Network

DANBURY, Conn. — The Graphic Sciences, Inc. Dexnet facsimile network includes the Dex 4000 automatic send-and-receive family and two recently developed facsimile transceivers, the Dex 1100 series and the Dex 5100 series of digital transceivers.

The Dex 1100 series includes two-, three-, four- and six-minute analog machines compatible with AM, FM and CCITT standards while the Dex 5100 offers a downward (analog) compatibility option and meets the CCITT standards, according to a spokesman.

"High-volume users can place Dex 5100 transceivers strategically to cut line costs . . . and use analog equipment like the Dex 1100 series in remote, low-volume locations," he suggested.

The Dex 5100 can send a full page of text in 20 sec, the spokesman said. Standard features on this model include modular, microprocessor-controlled architecture and automatic document feed.

Option 1

Option 1 features include automatic dialing and poll-and-receive from an internal memory that stores 200 telephone numbers, a simultaneous send-and-receive capability, a 9,600 bit/sec modem and compatibility with two- and three-minute Dex AM and three-minute CCITT analog devices.

Transmissions can reportedly be made at 65-, 98- or 196 line/in. over voice-grade lines.

The Dex 1100 series is microprocessor-controlled to allow communications with Dex AM, CCITT AM, industry-standard FM and with the Dex 5100 digital transceiver, the spokesman said.

The Dex 1102 and 1103 provide vertical resolutions of 88 line/in. at 3 min/page and 62 line/in. at 2 min/page in the Dex AM modes; and 96 line/in. at 4 min/page in the FM mode.

FM Mode

The Dex 1101 was designed to operate at 96 line/in. at 6 min/page and 64 line/in. at 4 min/page in the FM mode.

The Dex 1102 and 1103 are capable of transmissions in less than two minutes. Reduced line charges result from standard features including bidirectional editing indexes, automatic electronic handshake and operator interrupt, the spokesman maintained.

The basic, table top 1101 model sells for $2,200 and rents for $62/mo, which includes maintenance. The Dex 5100 can be purchased for $12,000 or rented for $300/mo on a one-year contract.

The Model 5100's auto-dial option costs $1,500 or $30/mo on rental; the model's compatibility feature costs $3,000 or rents for $60/mo. The full-duplex option costs $1,000 or $20/mo and the 9,600 bit/sec modem is priced at $2,000 or $40/mo on rental.

Graphic Sciences, a Burroughs Corp. subsidiary, is located at Corporate Drive, Commerce Park, Danbury, Conn. 06810.

Spectron Offers Printer/Monitor

MOORESTOWN, N.J. — The Spectron Corp. D-201 printer/monitor reportedly can be teamed with the vendor's Datascope D-5-1B/502B printer to deliver hard copy of data originally sent at speeds up to 100k bit/sec using virtually any line discipline.

The D-201 prints Hex, Ascii, Ebcdic and other codes at up to 900 char./sec, Spectron said, adding asynchronous lines can be monitored at any transmission rate up to 9,600 bit/sec.

Also compatible with Spectron's D-601 Datascope printer, the D-201 can function as a stand-alone, hard-copy line monitor providing simplex and half-duplex operation, a spokesman noted.

Printing is accomplished by an electrosensitive rotary-head printer with three removable cartridge print heads, each consisting of a 7-element stylus. The print heads are motor-driven at a constant speed, and the 120° spacing of the print heads places each one in contact with the paper at all times, according to the spokesman.

The paper is fed under the print heads, which are sequentially pulsed to form the appropriate characters. The printer mechanism is slide-mounted for access to paper and motor drives.

The RS-232C-connected D-201 weighs less than 28 lbs and draws approximately 240W of 115/230 Vac power at 50 to 60 Hz.

The D-201 costs $4,500; additional character codes cost another $600 to $800 each. Options include a slide rack mounting adapter for $220, an RS-232C interface for $240, a 20/60mA current-loop interface for $135 and a current-loop interface — polar and neutral to 9,600 bit/sec — for $240.

Spectron Corp. is at 344 New Albany Road, Moorestown, N.J. 08057.

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Fiber Optics Couplers Unveiled

TORONTO — Fiber optics directional couplers that allow bidirectional information transmission on a single optical fiber are available from Canstar Communications.

Canstar directional couplers in models TC4-A, -B and -C are offered in a range of coupling ratios and are designed to serve as both taps and feeds in fiber optics systems.

Used as taps, the couplers serve to divide the optical power in a single channel and to distribute it among one or more secondary channels, a Canstar source said. For instance, they permit the attachment of several computer terminals to a single data bus for multidrop systems.

As feeds, the couplers can be used to feed signals from one channel into another to merge channels to or from an optical source.

Model TC4 couplers have four I/O ports. Light entering through any port is cross-coupled to both fibers on the opposite side. These couplers incur insertion losses of well below 1 decibel to provide directivity of greater than 40 decibels, Canstar said.

The couplers are packaged for industrial and telecommunications applications. Standard models are said to be supplied with fiber pigtails or may be ordered with integral fiber optics connectors.

These couplers can accommodate upcoming high-volume, low-cost commercial applications such as community antenna TV, according to a Canstar spokesman.

Since the design permits the introduction of high-quantity manufacturing economies, "fiber optics couplers are no longer complex multicomponent laboratory curiosities," the spokesman said, adding "they can now be confidently engineered into communications and data networks with the realistic expectation of consistent performance and future cost savings."

All TC4 models are available for a variety of glass and plastic clad step index and graded index fibers. For optimal system design, the index profile of the coupler's I/O cable must be matched to that of the system fiber chosen, the vendor source said.

The couplers cost $200 with quantity discounts available, the firm said from 1240 Ellesmere Road, Scarborough, Ontario, Canada M1P2X4.

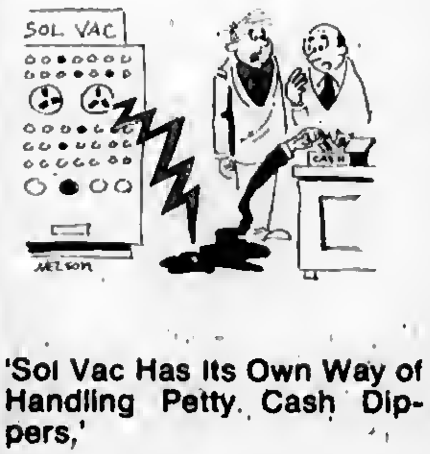
System Teaches Keyboard Users

ELK GROVE VILLAGE, Ill. — The Advanced Systems, Inc. Keytrainer audio/visual training system is a set of software programs intended to assist both experienced and new keyboard operators who use remote, teller and point-of-sale terminals for programming, word processing or data entry.

Already employed in Europe, the system is able to increase productivity by as much as 20% and to lower the frequency of errors by up to 50%, its developers claim.

Keytrainer is said to provide self-paced skills training with an easy-to-operate audio/-visual unit that features 35 mm filmstrips with synchronized sound.

The set of programs costs $5,500, Advanced Systems said from 1601 Tonne Road, Elk Grove Village, Ill. 60007.



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TMA Elects Officers

PITTSBURGH, Pa. — The Telecommunications Management Association (TMA) has inaugurated the following individuals as elected officers:

- Delbert Henry of National Steel Corp., president.
- William A. Barton of Gulf Oil Corp., first vice-president.
- John Hill of Aluminum Co. of America, second vice-president.
- James R. Avoli of L.B. Foster Co., secretary.
- T. Richard Moore of Fisher Scientific Co., treasurer.
- Wil Schomburg of Bessemer & Lake Erie Railroad Co., director.
- Howard Hess of Universal Cyclops, director.
- Virginia Ritson of Lord Corp., director.

TMA meetings are held on the first Wednesday of each month, September through May. Programs include presentations by vendors, panel discussions by competing vendors, member round-table discussions and field trips to vendor installations.

Additional information is available from John Hill, Aluminum Co. of America, 1501 Alcoa Building, Pittsburgh, Pa. 15219.

Harvard Studies Focusing On Telecommunications

CAMBRIDGE, Mass. — The Harvard University Program on Information Resources Policy has announced research efforts in the area of telecommunications industry competition and regulation.

David J. Seipp of the program will survey developments in the regulatory and judicial arenas since the first consideration of a competitive domestic common carrier application in 1969. Primarily concerned with domestic specialized common carriers, Seipp will investigate analogous experiences in resale and sharing services, international telecommunications, domestic satellites, terminal equipment and the boundary between the telecommunications and computer industries.

A second project undertaken by Harvard's Irwin Bupp and Alan Jakimo will explore recent developments in telecommunications regulation in light of the regulatory and competitive environment of the telecommunications and computer industries.

The first objective of this project is to write a series of about 10 related case studies for use in a course on manufacturing policy at Harvard's Graduate School of Business Admmistration next year. Plans include two case studies of semiconductor/integrated circuit design and manufacturing; two case studies of computer design, manufacturing and marketing; one or more studies of "interconnect equipment"; and several manufacturing aspects of coming "smart" telephones.

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List Contains 'Musts' of OCR Selection

By Dennis L. Sullivan
Special to CW

Users considering the purchase or installation of optical character recognition (OCR) equipment are faced with a multitude of choices. Following are some suggested guidelines.

- Conversion costs. The two prevailing concepts in the OCR marketplace are the "unit" idea, which involves upgrading or enhancing existing equipment, and the "system" concept, which requires the acquisition of a new system. Since the cost of acquiring a whole new system is considerable, it is clearly a major factor to consider.
- Throughput rate. All manufacturers of OCR equipment rate their equipment. A prospective user or purchaser should take time to send sample documents to a potential supplier for testing. In addition, first-hand observation and demonstrations can almost always be arranged by a vendor.
- Payback. Financial aspects of OCR equipment purchase should not be overlooked. Payback is dependent on total system cost, operating costs and throughput rates. Most reliable OCR manufacturers will work with you in this area to analyze your financial projections.
- Total system cost. Several trade-offs are possible when buying OCR gear. For example, one system might cost $100,000 and process 10,000 document/hour, while four smaller $25,000 systems might have an aggregate rate of 8,000 document/hour.

Although the smaller systems would require four operators and throughput would be somewhat lower, a purchaser would not be susceptible to total system failure.

- Equipment flexibility. This is an important area, given the nature of printed characters on documents. Among the considerations here are whether the read head can be adjusted to scan different locations on the document (and if so, how easily), how many lines of data the equipment can acommodate and the number of different fonts the system can recognize. In addition, a prospective user should ask how readily different fonts can be selected.
- Operator acceptance. Input from operators can be valuable, since they actually use the equipment and may have an outlook different from management. The best system is useless if operators will not or cannot adjust to a new methodology or technology.
- Delivery schedules. These are obviously important. A company's inability to deliver within a reasonable length of time could raise red flags in other areas. Another consideration relevant to delivery schedule problems is replacement parts availability. What is the company's track record on making such parts available?
- Equipment reliability. In order to get a representative sample of user experience with the equipment, several vendor-supplied references should be checked.
- Manufacturer credibility. A manufacturer's experience in equipment production and

(Continued on Page 50)

Insurance Company's IBM 3033 First of Its Kind in Midwest

By a CW Staff Writer

CHICAGO — Promise of an early delivery date for an IBM 3033 central processor persuaded Zurich-American Insurance Companies here to forego plans to add one or more attached processors to its heavily overtaxed 370/158 installation.

Zurich-American's 3033, a first-day order, was installed June 30. Anthony Studin, vice-president of data services, said IBM engineers "did a fine job of getting the system up." The CPU was delivered on a Monday and was ready to be turned over to the insurance company by late Thursday, he said.

The processor, which represents an investment of $3.3 million, is the first of its kind installed in the Midwest, according to Studin. The insurance company executive speculated IBM sent in a "very good team" to make a good impression with this early installation.

Zurich-American has used the system to put four of its 24 field offices on-line and expects to have all of them on-line eventually, he said. The four offices are connected to the 3033 over leased lines operating at a combination of 4,800- and 9,600 bit/sec.

By the end of this year, Studin said, the company will have an on-line network of 80 Courier Corp. 2770 terminals.

The system is used during the day for on-line entry and validation of insurance policies as well as for system testing, with evening shifts handling the company's batch work. The system is operating 24 hours a day, seven days a week, with the DP staff divided into three daily shifts.

The installation includes an IBM 3705 communications controller, four 3350 disk drives, high-speed tape drives, two 3211 printers and a Dataproducts Corp. 1,200 line/min printer connected throgh a Paradyne Corp. channel extender.

'Stable System'

Studin said Zurich-American's 3033 configuration is "a stable system" and credited careful planning with IBM representatives for the smooth transition from the 370/158. "In all my experience with changing com-

(Continued on Page 54)

RJE Data Entry System Helps Wheel Maker Roll Out Data

By Howard A. Karten
CW Staff

LITTLE ROCK, Ark. — When bicycling suddenly increased in popularity several years ago, it brought not only increased sales to the Wheel Goods Division of AMF, Inc. here, but a paper tiger as well.

The company found the increased paperwork that accompanied its business expansion caused delays in the delivery of paychecks, invoices and other important items.

The division, which manufactures and distributes AMF bicycles and accessories, had battled — successfully — with the paper tiger before, when it replaced its keypunch equipment with a key-to-disk System 1300 manufactured by Inforex, Inc.

"The high humidity of the Little Rock area always presented a problem with punch cards," according to Gene Kwasny, operations manager for the division.

So the company replaced the keypunches with key-to-disk units and, for a while, it was pleased with the result.

"When we first installed the System 1300 and eliminated our punched card operations, we were pleased with the improved controls and efficiency," Kwasny said. "We enjoyed the System 1300's reliability and ease of operation, but our volume suddenly skyrocketed and, consequently, we needed more sophisticated communications abilities to generate our payroll and invoicing reports on schedule."

Using IBM 2780 data transmission equipment, the company was sending more than 40 inventory, order and personnel reports each day to division headquarters in Olney, Ill. The sudden increase in volume that accompanied the rise in business led to delays in generating invoices and personnel reports.

These backlogs peaked at month's end, when the delivery of paychecks to Litte Rock usually fell behind schedule.

"Because we were batching all the data in

(Continued on Page 48)

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Contract Course Upcoming

NEW YORK — Brandon Consulting Group, Inc. will conduct an intensive, three-day course in computer contract negotiation here Nov. 13-15.

The company said the course is designed for managers with responsibility for preparing or signing contracts, for financial officers and for attorneys and other professionals responsible for preparing and negotiating DP contracts.

The $650 course fee includes a copy of a book on the subject written by two of the course instructors, selected copies of *Computer Negotiation Reports*, reference materials and a luncheon each day. Instructors will be the sponsoring firm's president, Dick Brandon; Sidney Segelstein, a partner with the law firm of Goldstein & Schrank; and Joseph Auer, president of International Computer Negotiations.

Preregistration is required. Additional information is available from Ruth Dargis, Brandon Consulting Group, Inc., 505 Park Ave., New York, N.Y. 10022.

'Scaled-Down' Sycor 400 Version Aimed At Low-Volume Data Entry

ANN ARBOR, Mich. — Sycor, Inc. has added a lower end system to its recently introduced 400 family of distributed processing systems (DPS).

The Sycor 404, a scaled-down version of the larger units in the series, features 48,000 bytes of main memory, a 12-in., 2,000-char. CRT, 50,000 bytes of flexible disk storage and a bidirectional Sprinter printer.

A spokesman for the company said the system was designed for users at remote sites with low-volume data entry needs that do not require more than one CRT station.

The system can process two separate jobs concurrently, the spokesman said, adding that the unit offers IBM's Binary Synchronous Control (BSC) and Synchronous Data Link Control (SDLC) communications protocols with speeds up to 9,600 bit/sec and asynchronous communications up to 1,200 bit/sec.

Three languages are available on the system: Cobol, Basic and Sycor's terminal Application Language (TAL) 2000. TAL 2000 is said to serve as a common bond between Sycor products and to have been designed for users who need a language specifically for "intelligent data entry programming."

A typically configured Sycor 404 with 48,000 bytes of memory, 500,000 bytes of flexible disk storage, a CRT, printer and communications adapter sells for $10,535, a spokesman said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Smart RJE Data Entry System Helps Wheel Maker Roll Along

(Continued from Page 47)

the evening, response time was getting very slow," according to Jack Moninger, DP manager at the division's Olney headquarters. "As a result, getting invoices out on time was a hassle and . . . the payroll department barely had enough time to get the checks out."

To meet this transmission problem, the company began investigating several alternatives to batching and transmitting the data. These options centered on providing on-line transmission capabilities to division headquarters.

Although AMF investigated the equipment offered by several vendors, it settled on an Inforex System 1303 intelligent remote job entry (RJE) data entry system with four workstations.

"We checked out Mohawk Data Sciences Corp. and a few other vendors but continued to work mainly with Inforex. We decided to stay with the company because [we felt that] it was the only vendor that could put together a data entry and communications package in a short time, Kwasny said.

Several Benefits

The System 1303 provided the company with several benefits: the storage capacity of the system tripled; the data compression and double buffering features of the system allowed the company to make better use of its communications lines and the Job Control Language (JCL) function of the system enabled terminal operators to change job queue priorities, according to Kwasny. This meant "hot jobs," such as the payroll, could be processed immediately.

As a result, daily personnel and inventory reports are generated up to six hours earlier than before, and applications were added to the company's on-line system.

"Previously, once the job transmission queues were set for the day, they could not be changed," Monninger said. "Now operators can easily set up a remote transmission, and a priority job such as payroll can be transmitted as soon as the data entry work is done, instead of at the end of the day."

This six hour average time savings in report generation is largely a result of the system's ability to transmit directly from disk, the use of a high-speed line printer and the increase in line speed from 2,400- to 9,600 bit/sec, Kwasny explained.

"Previously we could not get those reports to Little Rock until the middle of the afternoon, so we have in effect eliminated a one-day delay in report generation because the operators usually did not work on them until the following morning," he recalled.

In addition to decreasing turnaround time and being able to print hot jobs immediately, AMF's materials requirements planning program, which is used to forecast inventory needs over a long-term basis, was put on-line to the system.

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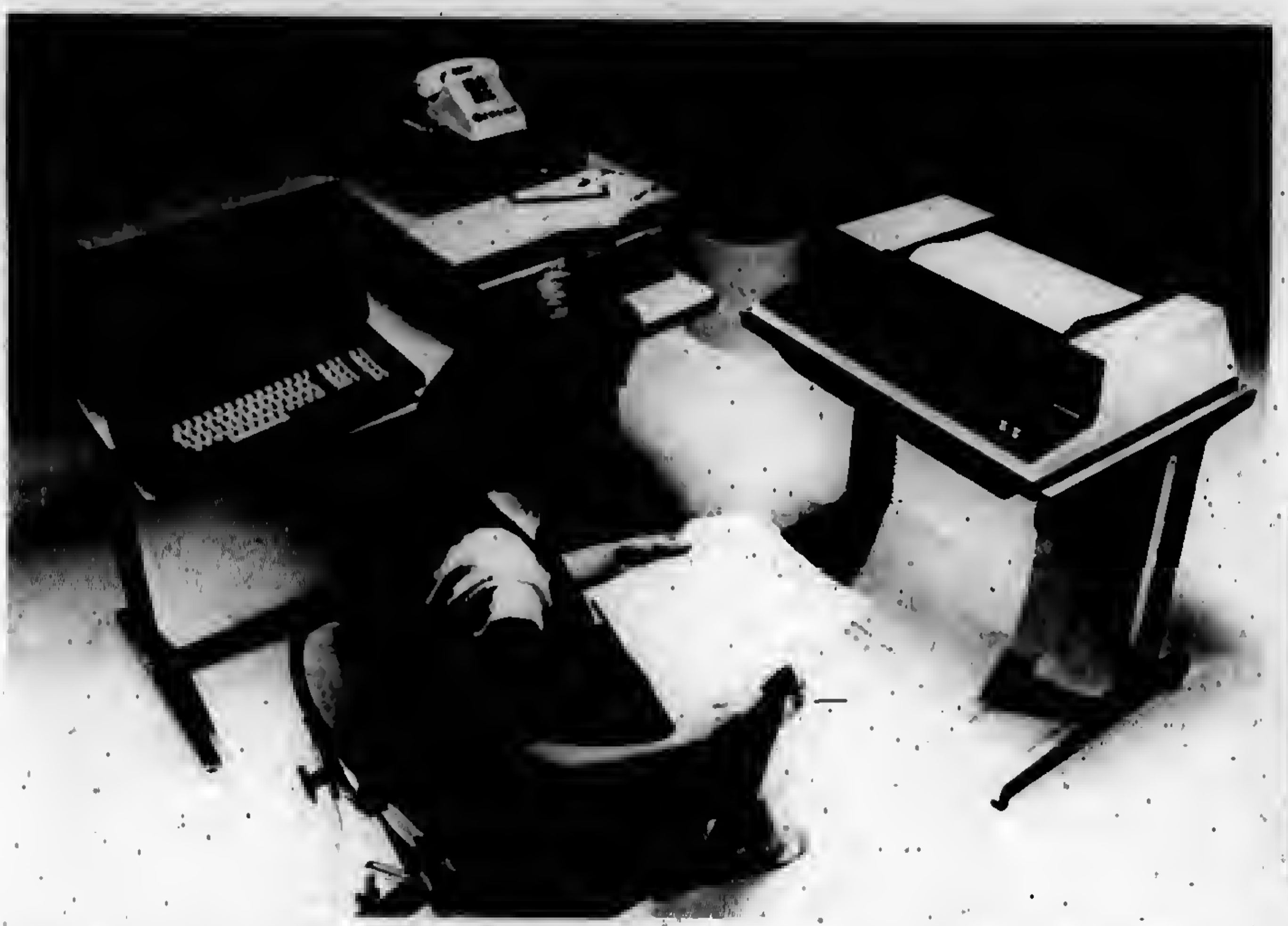

Capable of stand-alone or dispersed data processing, the 1800 fits easily into the office environment. An optional matrix printer is shown.

The new Datapoint 1800 dispersed processor is designed to adapt to today's business needs. Use it for data processing, data entry and communications — wherever you need a powerful and easily used computer capability that you can grow with. Use it stand-alone or in a widespread network; a built-in interface makes communications easy. You can even use the 1800 as part of an Attached Resource Computer™ System.

A detachable keyboard with a standard typewriter format allows for easy operator training and ease of use.

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The wide range of peripherals available (shown here with a matrix printer) allows you to tailor a system to the tasks at hand.

Its standard typewriter-format keyboard helps make operator training easy. And the large 80-column-by-24-row display with regular or inverse video helps make it easy to use.

Nationwide support

Datapoint's nationwide customer support organization stands behind the 1800, with over 500 service representatives in nearly 200 local offices. One toll-free call gets you support and service in a hurry.

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The 1800 leases for $370/month on a 3 year basis. One and two year leases, as well as rentals, are available. Metro-area maintenance is $124 per month.

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Datapoint has a corporate commitment: to fill today's business data processing needs better than anyone else. To do that, we have to out-think, out-perform and out-service our competition. The 1800's low cost and sophisticated capabilities put us another jump ahead.

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College Increases Fortran Throughput 16-Fold

By Howard A. Karten
CW Staff

WORCESTER, Mass. — A Digital Equipment Corp. VAX 11/780 installed here recently by the College of the Holy Cross reportedly runs Fortran programs 16 times faster than the school's previous system, an IBM 370/125.

Thor Olson, director of DP for the college, said the VAX 11/780 delivers this performance without the floating-point accelerator available on the system. With the addition of this feature, which the school is currently considering, he estimates the system's performance could double.

Olson said the school decided to buy the system when it became apparent the 370 was becoming overloaded. That system, which was used for both academic and administrative tasks, will continue to be used solely for administrative work, while the VAX 11/780 will be dedicated to academic and research work.

"We looked at several alternatives, including a larger IBM system and off-loading some of the work onto another system. However, IBM doesn't provide much in the way of time-sharing for academic users that was within our budget.

"We needed a machine that could run large Fortran programs well and that had a time-sharing ability. The only such product available from IBM was VM, we felt, but the price of the system was too high — it was overkill," Olson continued. "Also, we were looking for something easy to use for the casual user. Most of our users run canned Fortran programs, so the VAX seemed a better choice for that application."

College officials said the VAX system will support a combination of CRTs, printers and special I/O devices to be used for interactive processing of instructional and research-oriented activities.

Approximatley 25% to 30% of the statistical packages have already been converted, Olson said, adding that the process of moving users from the older IBM system to the VAX will continue for the next few months.

The system will be used by faculty and students in the departments of economics, sociology, psychology, political science and history. It will also perform high-computation and simulation programs for the mathematics, chemistry and physics departments and will support a music laboratory.

In addition to these ambitious plans, the school is also considering implementing computer-assisted instruction (CAI) in several areas.

The configuration presently in use includes 1M byte of memory, 352K bytes of disk storage, a magnetic tape subsystem and a communications interface for 16 lines. The principal language will be Fortran-IV Plus, with Basic and VAX-11 Macro Assembly Language. All programs will run under the VAX/VMS operating system.

Although it has only been running for a few months, the experience thus far has been gratifying to college officials. "Performance has been very good so far, and we feel this will provide us with a pathway to the future," Olson concluded.

Auerbach Offers Reference Aid

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has announced the availability of *Dataworld*, a four-volume reference service covering the most common and actively marketed U.S. and international DP systems.

The service, which will be updated monthly, will contain in-depth coverage of general-purpose DP systems including plug-compatible processors, small business computers, minicomputers, peripherals, data handling, system support software, data communications, terminals, peripherals, applications software and other subjects, the company said.

Included in the service will be in-depth tutorials examining applications within each industry segment; comparison charts presenting specifications and characteristics of equipment; product reports providing analysis and users' reactions; pricing data; and how-to management tutorials offering practical methods of applying the technology discussed.

Dataworld will cost $425 through 1978 and $485 thereafter. A 30-day free trial period and additional information are available from Auerbach at Department PR, 6560 N. Park Drive, Pennsauken, N.J. 08109.

List Details OCR 'Musts'

(Continued from Page 47)

the financial stability of a vendor are important when buying equipment. In particular, a manufacturer experienced in solving manufacturing and maintenance problems and well-versed in product development offers much expertise to equipment purchasers.

- Vendor support. In this regard, make sure the vendor is financially stable and will support its equipment. It never hurts to get a client list.

There are reasonably priced, effective OCR systems available on the market, but it takes a lot of effort to choose one for your company.

Sullivan is a consultant to Key Tronic Corp. of Spokane, Wash.

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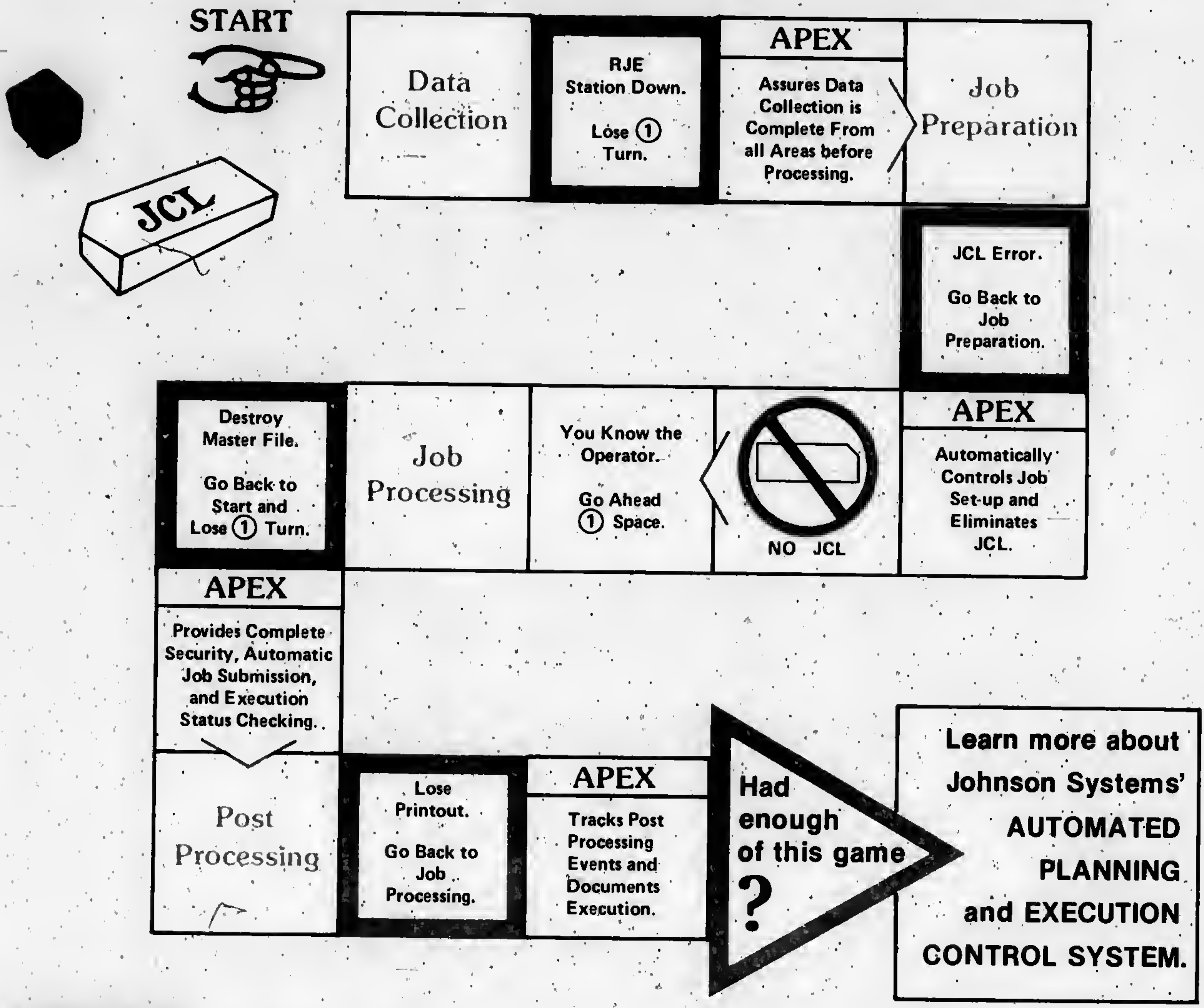
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Distribution Problems Eased

Order Entry System Spreads Benefits for User

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TOLEDO, Ohio — Can a computer system, unlike a man, be all things to all people?

An order processing system installed two years ago at the DeVilbiss Co. may come close. George R. Huston, manager of distribution operations, likes the way the system smooths the distribution cycle for the company while it saves time, trouble and money. Richard Wahl, head of the company's management information systems (MIS) recognizes the system's contribution to both field flexibility and home office control.

And Dino Lioi, manager of one of the company's regional distribution centers, is impressed with its customer service support.

"In our business, effective distribution is vital," Huston pointed out. "If we cannot deliver the item the customer wants when he wants it, we risk losing a sale. Ready availability of line items at the six regional distribution centers across the country and a high level of customer service are critically important.

Speed is essential to turn orders around for delivery. The system gives us a big assist, sharply reducing the number of costly, customer-annoying, time-consuming order errors," Huston explained.

The DeVilbiss Co. manufactures and markets paint finishing equipment and related products. It serves the automotive, appliance and furniture industries as well as professional auto body shops and painting contractors with its own direct sales force and a national network of after-market and industrial distributors.

About 8,000 items are carried within the company's broad product line, with an autonomous Health Care Division manufacturing respiratory equipment for professional and home use.

Each of the company's six distribution centers stocks about 4,000 line items. The Toledo master distribution center is responsible for resupplying the regional centers as needed, and stocks the company's entire product line.

To service this operation, the company uses an IBM 370/135 which runs under DOS/VS. The 320K-byte system communicates with IBM 3741 Model 4 intelligent terminals at the distribution centers over dial-up lines.

The terminals are a refinement of a product distribution and customer service system that has been undergoing a major revamping during the past three years. The sweeping upgrade program has led to the creation of an individual distribution department within the DeVilbiss marketing organization and the consolidation of 11 distribution facilities into a network of six regional distribution centers, including the master center here.

Reorganization Plan

A basic move in the DeVilbiss reorganization of product distribution and customer service operations was to decentralize customer order entry by shifting the responsibility for this function from headquarters to the field facilities.

"Initially," Huston explained, "we utilized a conventional system for this, involving punch paper tape units at each regional distribution center. This proved inadequate since order processing was too slow and we had a high error rate in the punched paper tape data transmissions between the regional centers and headquarters.

"We needed something better for both on-site order processing and remote data communications," he recalled.

The order entry system solved both these problems for the company. After a preliminary manual edit, orders now go to the distribution center's terminal operator who enters the customer's number, then sees an immediate display of the customer's name and address on the terminal screen.

This visually validates customer identification and also eliminates the former time-consuming search for a customer card in an index file.

The terminal unit automatically assigns a sequential invoice number and guides the operator through entry one step at a time. As the operator keys in order data, the terminal simultaneously records the order document and stores order data on a diskette.

After the oprator enters the order item and quantities (an average of five line items per order), the system adds up the total and displays it as another visual check.

Completing Order Entry

Order entry is completed after the terminal operator keys in any special instructions, such as prepayment, ship complete or partial shipment acceptable plus shipping charge amounts for any COD orders.

Full order details are stored, in entry sequence, on the diskette record.

The printed order document serves as both pick list and a shipping label. This is a turnaround document that comes back to the terminal operator after the order is picked and shipped.

When it is returned to the operator, he keys in the customer and invoice,

(Continued on Page 53)

What to do for a DBMS headache.

A look at data base management systems in our October 30th Special Report.

Getting the right information to the right people at the right time can create tough problems in any large DP system. And the increased bulk of associated information that DP systems handle means a need for more efficiency, capability, and responsiveness.

Data base management systems — the heralded, but controversial solution to increased systems complexity — is the subject of our October 30th *Computerworld* Special Report. Edited by Don Leavitt, *Data Base Management Systems* will be examining many of the uncertainties about DBMS which make it difficult for the planner to determine whether it suits his needs. We'll have stories from users themselves; telling you how they have utilized DBMS, as well as words to the wise on DBMS "overkill". We'll have tips, pointers, and in-depth reviews on evaluating, selecting, applying, and trouble-shooting DBMS, including topics like:

- ■ *The impact of new DBMS on an organization: who "owns' " the data? Who's responsible for its accuracy? Who can use it?*
- ■ *Using DBMS on minicomputers [and even micros].*
- ■ *Relational systems: How they're doing in the real world.*
- ■ *The future of DBMS.*

If you currently use DBMS software, or are planning to buy, this Special Report will be of special interest to you. And if you market DBMS, you'll reach a wide end-user audience here. Ad closing date is October 13th, and your *Computerworld* representative can give you full ad planning assistance. Or, to reserve space for your ad, call Terry Williams at 965-5800.

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Switching Power Supply Handles 130 Watts

SUNNYVALE, Calif. — A quad-output switching power supply from Boschert, Inc. is said to provide users with 130 watts of power at 60% to 70% efficiency.

The OL-130 continuous power from each output at levels is a four-output unit that can supply +5V at 15A, -5V at 2A, +12V at 4A and -12V at 2A.

Input voltage on the unit is user-selectable at 115V or 230V strappable, the company said. The unit can accept inputs from 95V to 130V for the 115V input and 190V to 260V for the 230V option.

The unit is said to provide 16 msec of continuous full output power in the event of an input line voltage loss; an optional power failure detect circuit can provide a TTL signal suitable to initiate data transfer, according to a spokesman.

Standard features on the unit include an EMI filter, reverse voltage protection, a series thermistor that reduces line surges at turn-on and short-circuit protection.

The OL-30 costs $193 in quantities of 100, the company said from 384 Santa Trinita Ave., Sunnyvale, Calif. 94086.

Honeywell Users Planning Phoenix Forum This Month

PHOENIX — The Honeywell Large Systems Users Association (HLSUA) will hold its 27th annual Forum meeting here Oct. 15-18.

Forum will offer workshops, seminars and lectures on 65 different topics by Honeywell, Inc. and HLSUA representatives in a three-day program organized by the association's applications, installations, systems, languages and utility software committees.

Among the subjects scheduled are improvements in Gcos operating system, an overview of Level 66 hardware/software, the Level 6 distributed systems environment and a Fortran update.

Also planned are presentations on converting from Honeywell's IDS/I data base management system to IDS/II and on enhancements to the company's DM-IV and Universal File Access System.

The Forum keynote address will be delivered at the Monday morning general session by Russell G. Henderson, vice-president and general manager of Honeywell's U.S. computer marketing operations.

Additional information is available from Ron Miller of Honeywell at P.O. Box 6000, Phoenix, Ariz. 85005.

Order Entry System Pleases All Users

(Continued from Page 52)

numbers. If the order has been shipped completely, this is the only information the operator need enter. If there has been a discrepancy in the physical inventory, that information must be entered as well. Otherwise, out-of-stock items are "prebackordered."

Entry Completion

The operator completes the shipment transaction entry by keying in the carrier and bill of lading numbers as well as the shipping date. All shipment-related data is recorded, again in order number sequence, on a separate diskette.

After the close of the day's business at the distribution center, information on both diskettes is transmitted to headquarters over dial-up phone lines. The 370/135 at headquarters readies the data for processing against the master record files.

"We use the data from the distribution centers to update customer and item master sales records and to adjust individual distribution center inventory status records to reflect the day's shipments," Dick Wahl, MIS manager, explained.

"And if the day's shipments have dropped any inventory item below a preset minimum stock for the particular distribution center, the computer automatically initiates a replenishment stock shipment to that center, which will go out on the next resupply truck from the master distribution center in Toledo."

Billing Input

Order shipment data from the regional centers also becomes input to the centralized customer billing routine at headquarters. "Billings go out at night," Wahl pointed out, "so we're not only turning incoming orders around for delivery within 24 hours, but we're also getting the invoice into the mail within 24 hours of order receipt.

"The improvement in our cash flow that results from the timeliness and accuracy of the customer billings is substantial. We estimate the system has reduced the number of data errors that delay billings by more than 85%."

DeVilbiss installed the 3741 terminals one at a time at the distribution centers, with the first installation at the Cleveland center back in 1974. "Conversion from the old paper tape system was smooth and problem-free," Huston said.

"The terminal is easy to operate so several office employees at the distribution centers can handle the order entry function. The system has proven very reliable, is already fully cost-justified and helps to make distribution operations efficient," he added.

UPS Works At 20 kVA

NUTLEY, N.J. — A 20 kVA uninterruptable power supply (UPS) recently introduced by Nova Electric Manufacturing Co. is said to provide voltage regulation to within 1% and frequency regulation to within .5%.

Standard features on the unit include frequency and phase synchronization, output voltages of 120V and 240V, output frequencies of 50Hz and 60 Hz and a distortion of less than 5% total harmonic distortion (THD).

Options available with the unit include special metering, a manual bypass switch, a 24-hour timer, alarms with remote contact closures and dual-output voltages.

The UPS sells for $16,150 from the company at 263 Hillside Ave., Nutley, N.J. 07110.

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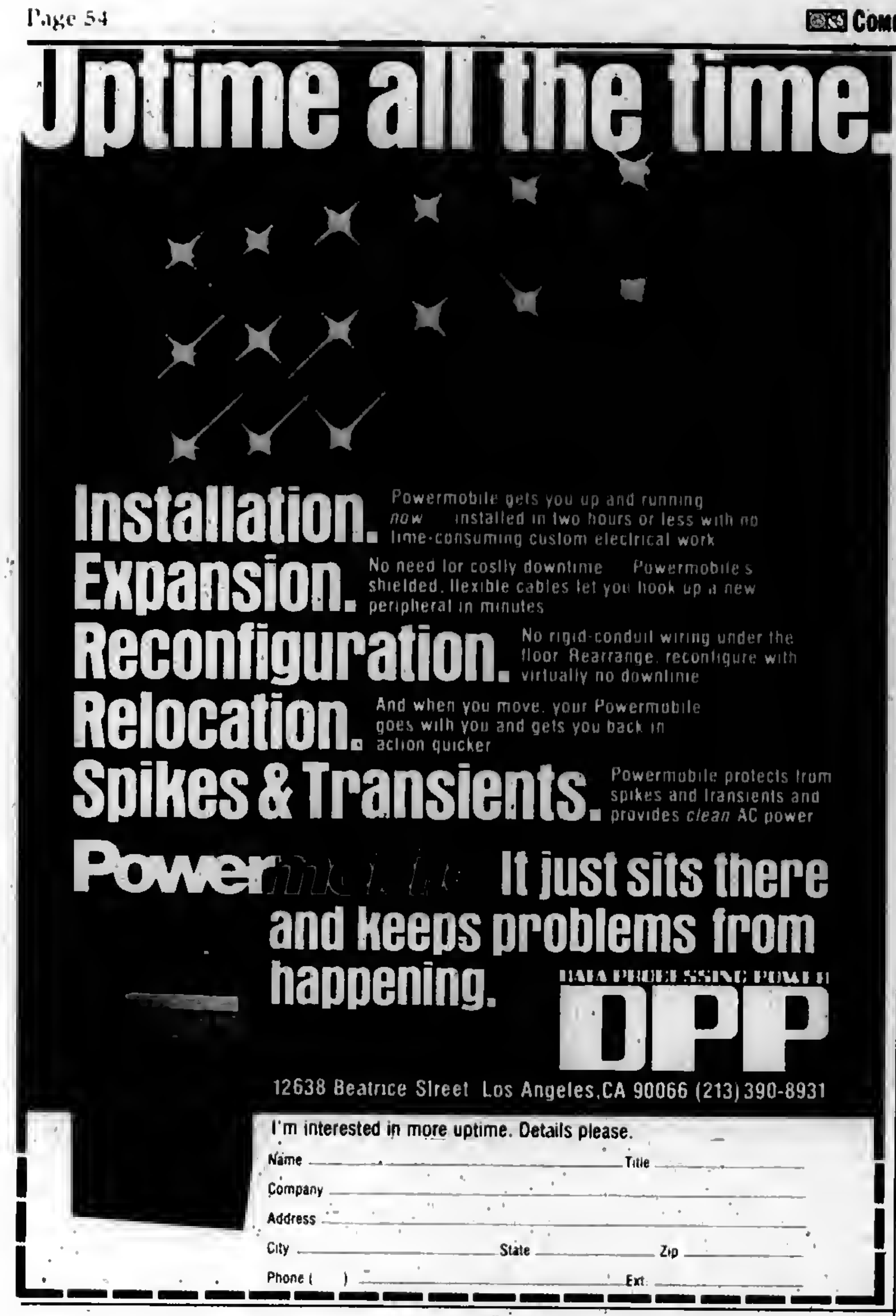

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Add-on Helps Utility Boost Evening Throughput 40%

BRIDGEPORT, Conn. — The installation of additional memory and a disk subsystem on an IBM 370/135 at a local gas distributor here has helped the company increase throughput 40% on its evening production shift.

The Southern Connecticut Gas Co.'s 125,000 customers are handled by two divisions within the company. Before adding the additional memory and disk, the billing was performed in two runs, one right after the other, but with the additional equipment, the two jobs run concurrently.

The system also has increased responsiveness to customer needs, according to James P. Healy, the utility's vice-president of management services. For example, under the old system when a customer's payment arrived after his monthly billing cycle had passed, the transaction could not be posted until the following month. If the customer called during the interim, the representative would check through a weekly list of all such "off-cycle" transactions. This time-consuming procedure often required a call back.

In contrast, the system now prints out daily "off-cycle" lists so that queries can be answered while the customer is on the telephone. Southern Connecticut Gas is currently moving toward a real-time system in which queries will be keyed into terminals for immediate on-line access to records.

"Our system had the potential to do more, but it lacked sufficient real memory and external disk capacity," Healy recalled. This showed up in a high paging rate and the inability to run an adequate number of jobs concurrently.

To solve the problem, the company invited several vendors, including IBM, Itel Corp. and Memorex Corp., to bid on add-on memory. References from another local company as well as price considerations helped persuade the company to choose a Memorex 6400 memory system with 368K of memory and two Ampex Corp. 3675 disk drive modules.

"Installation of the add-on was uneventful — it was completed over a weekend," Healy said. "It took longer to install the disk units because the changeover involved some modifications of our software packages, but Memorex personnel were very cooperative and instrumental in resolving the problems."

Although the installation experienced some minor problems at first, which Healy termed "just small wrinkles," he reported that no real problems had been experienced with either system.

The added memory has enabled the company to get into on-line programming, using an IBM program product called Entry Time-Sharing System (ETSS). Healy explained that ETSS was a kind of "scaled-down version" of TSO, which usually runs on larger systems under MVS.

Routine commercial applications, including inventory control, work measurement, accounts payable, payroll and records management, are handled during the day shift. At night, the computer batch processes customer accounts and bills. The billing operations are accomplished at an average 40% time savings.

"The system has been very stable since installation last fall," Healy said. "Our customers receive more prompt service, while our staff is pleased with the increased flexibility and throughput."

Docutel Unveils Upgrade Of TT 300 Teller Terminal

DALLAS — Docutel Corp. has introduced an upgraded version of its TT 300 automated teller terminal that it says will permit existing Docutel customers to protect their investment in Docutel equipment for coming years.

The TT 2300 is described as a redesigned version of the TT 300 and fits in the same space as the TT 300s. The unit is said to feature state-of-the-art technology and be two to three times more reliable than the old machine. In addition, the system can now handle increased volume, a spokesman said.

Features include an expandable memory that allows the system to continue functioning if the host goes down; a capacity of 4,400 new bills in a two-denomination dispenser, a larger printing capacity than its predecessor and maximum memory size of 32K words. The cost of supplies for the system to process 50,000 transactions is approximately $80, the company said.

The basic TT 2300 costs about $27,000, according to Docutel, and a field upgrade from a TT 300 starts at $12,000. The company is located at P.O. Box 222306, Dallas, Texas 75222.

Company's 3033 a 'First'

(Continued from Page 47)

puters," he said, "if you work properly with IBM there is no problem in getting these things installed with a minimum of hassle."

The insurance company's DP staff of 87 persons, including six systems programmers, was also able to make a fairly smooth conversion from a VS1 to an MVS operating system for the new CPU, according to Studin.

The old system, he said, was "saturated to the point we were being hampered," whereas the 3033 system has "plenty of CPU power."

However, he said, with MVS and the additional demands of increasing on-line capabilities, the system is "constrained until we get more memory on it." Studin said the company expects to add 2M- to 4M bytes of Intel Corp. memory within the next two months.

As the system grows, he added, the need for a contingency plan to cover long-term interruption of service becomes more necessary.

Decstation Systems Gain Three Levels

MAYNARD, Mass. — Digital Equipment Corp. has added three levels of Decstation business systems — the 78 and two 88 series levels — aimed both at first-time users and users who want to upgrade.

"A small number of our customers, such as law and accounting firms and small wholesalers, have the 78 series machine and now want to expand," a DEC spokesman said. Users can now process disks from several 78 series machines at a centralized 88 model, he noted.

The machines announced were the Decstation 78/50, an entry-level system for standalone use in a small business environment; three mid-level Decstation 88 models, which permit system expansion and provide a link to the low-end 78 model; and the upper level Decstation 88/90 for large data base applications.

The systems include more standard software, particularly the COS-310 commercial operating system and the general-purpose OS/78 operating system. High-level languages supported include Dibol, DEC's business-oriented language, commercial Basic and Fortran IV.

Decstation 88/50

The Decstations employ DEC's latest disk storage technology, according to the spokesman. The Decstation incorporates the VT78 CRT terminal and the RX02 double-density floppy disk drive; the Decstation 88s employ the VT100 terminal, a PDP-8/A processor, an RX02 floppy disk drive and an RL01 disk pack drive, the company said.

Each of the three Decstation 88 models incorporates a PDP-8/A processor with 32K words of memory, the VT100 CRT terminal and a choice of mass storage devices in cabinets designed for office environments.

The three mid-level models are the 88/50, 88/70 and 88/80. The 88/50 has two floppy disk drives and includes licenses for OS/78 and COS-310. The 88/70 is the same configuration with four drives.

The Decstation 88/80 includes two floppy drives and a 5M-byte RL01 disk drive; it can

(Continued on Page 56)

Adventists Make Conversion From System/3 to Wang Mini

GLENDALE, Calif. — The Southern California Conference of Seventh-Day Adventists has undergone a conversion of the computer kind. The group, the second largest conference of Adventists in North America, converted in July from an IBM System/3 Model 8 to a Wang Laboratories, Inc. 128K-byte CPU.

"I'm really satisfied, to date, with the equipment," Carl F. Friday, DP chief for the Southern California Conference, said.

The purchased Wang VS system, which includes a 220 line/min 2263V printer, two 75M-byte disk drives and six CRTs, has 30 times the storage capacity of the System/3.

The additional storage is crucial because of the 10 different applications on the church conference runs. Besides handling standard payroll and 32,000-item general ledger operations, the conference acts as a service bureau for six Seventh-Day Adventist local congregations. The goal is to extend this local church service to as many as 25 churches, Friday said.

The DP shop also processes the Adventists' medical program, donations, payables, associated reports and membership directories, which can be printed for local churches directly from computer output.

The Southern Conference is one of six conferences in its union, and eventually all the conferences will have Wang computers linked together, Friday noted.

Running a church today is a complicated business, particularly in Southern California, which has the highest concentration of Adventists anywhere. There are approximately 33,000 Adventists in the counties of Los Angeles, Santa Barbara and Ventura,

(Continued on Page 60)

Fastest Execution Claimed

Fortran VII, 8/32 Packaged

OCEANPORT, N.J. — Perkin Elmer Corp.'s Interdata Division is offering two systems that combine its Model 8/32 Megamini and associated peripherals with the globally optimizing Fortran VII programming language introduced in July.

The Fortran VII-based systems allow users to develop and execute application programs at higher speeds than minicomputer systems which do not use Fortran VII, according to the firm.

For example, the Fortran VII 8/32 system can perform a table-handling binary search of a 40K-byte array in 26 sec, almost one-fifth the speed of competing Fortran systems, Interdata said. Fortran VII programs can be compiled at speeds of more than 1,500 source line/min, a spokesman added.

The two systems include the Interdata Model 8/32 Megamini, one with 512K bytes of main memory and the other with a 768K-byte main memory storage capacity. The smaller system has a 10M-byte disk while the larger system uses a 67M-byte disk and the Fortran enhancement package with 2K writable control store.

Features available on both Fortran VII systems include high-speed floating-point hardware, 800 bit/in. magnetic tape, the OS32MT multitasking operating system, Common Assembly Language (CAL) macro, a carousel console, system diagnostics and documentation.

The systems feature automatic job control, which allows Fortran programs to be com-

(Continued on Page 58)

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CDC Expands Line, Cuts Prices of IBM Units

MINNEAPOLIS — Control Data Corp. has announced a larger fixed-disk subsystem in its Certainty Series of mini-peripherals and terminals for users of the IBM Series/1 minicomputer.

At the same time, the company lowered prices an average of 20% on a number of its other Series/1-compatible peripherals that were announced in June.

The Certainty 230 Model 30 fixed media device provides a formatted storage capacity of 63.2 million bytes of data. The subsystem includes disk drive, LSI single-board controller, diagnostics and the interconnections needed for use with the IBM Series/1.

Other units in the Certainty 230 family provide storage capacities of 9.3 million and 19.7 million data bytes.

For users designing systems that incorporate both fixed and movable disk drives, the Certainty 230 series is fully compatible with the company's previously announced Certainty 270 series of removable media storage module drives, the firm said.

Both series have identical data formats, transfer rates and disk track capacities so users can exchange information between the two types of drives to meet their requirements, a spokesman noted.

The product is aimed at sophisticated end users with very large installations; prices are geared to quantity purchasing, the spokesman said.

End users can purchase the Model 30 subsystem in quantities of 100 units for under $8,000 each. For 10 to 24 units, the price is $9,590 and includes all hardware, software, diagnostics, installation and a 90-day warranty on parts and labor. Maintenance is available for $48/mo. Initial customer deliveries currently are scheduled for the second quarter of 1979.

CDC also announced a price cut for other disk and band printer products in its line of Series/1-compatible mini-peripherals.

Thirty-three percent comes off the price of the Certainty 270 series of storage module disk subsystems. That makes the 63 million-byte 270-10 disk — at the low end — $12,430 in quantities of 10 to 24 and the 240 million-byte 270-30 subsystem at the high end $26,590 in the same quantities.

In quantities of 100, those prices drop to less than $10,000 and just under $23,000, respectively.

The price of the Model 450-10 band printer (360 line/min) in quantities of 10 to 24 has been dropped to $9,900 and the 720 line/min Model 450-20 — has been dropped to $13,650, respectively.

In quantities of 100, those prices are $9,200 and $12,700, respectively.

Stations Get Three Levels

(Continued from Page 55)

transfer data between smaller Decstations and large ones because files can be transferred between the floppy and RL01 disks.

The largest Decstation introduced, the 88/90 series, consists of a PDP-8/A processor with two RL01 drives. The 88/97 model includes 64K words of memory.

Decstation 78/59 prices start at $8,250 in single-unit quantities from the Maynard, Mass. manufacturer. Decstation 88s range from $11,500 to $25,100.

Deliveries start in December.

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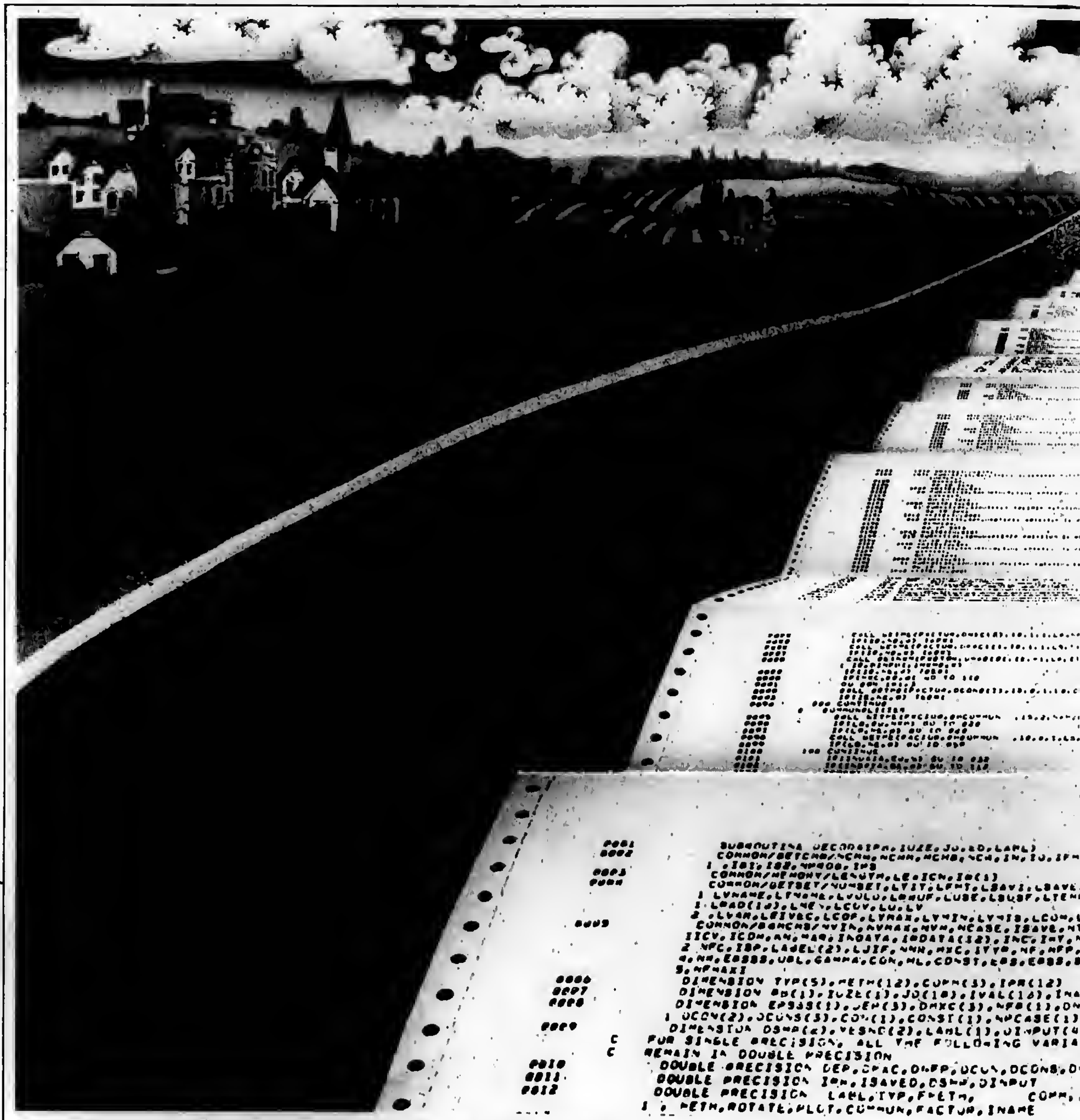

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Distributed Processing System

Irrigator Flows to Mainframe via Small System

RIVERSIDE, Calif. — The Irrigation Division of Toro Co. here is using a small business computer for on-line as well as batch processing. The computer works in a distributed processing system with an IBM 370/145 located in the company's corporate headquarters in Minneapolis.

The Toro Irrigation Division manufactures sprinkler heads, automatic controllers and valves for use in golf course, commercial, agricultural and residential irrigation systems.

Before purchasing the Hewlett-Packard 3000 in November 1976, all data processing was done in batch mode by the 370 through a remote job entry (RJE) terminal in Riverside. But batch processing was insufficient, both in terms of speed and capability, for the division, which has had an accelerated growth rate over the last five years of 19%.

As a result, the division needed to develop its own dedicated, on-line systems.

Processing Mix

"We decided on the HP 3000," according to Emmet Rixford, manager of information systems, "because it had the best price/performance ratio of anything we could find. It allowed us whatever mix of RJE, local, batch and on-line processing we needed and offered us better vendor support than we believed we'd get anywhere else."

The division's various application programs had been running on the IBM 370/145 through an IBM 3780 RJE terminal. Since the HP 3000 was brought in-house, however, and the 3780 RJE terminal was eliminated, the Irrigation Division has been able to continue running the old programs by using the HP 3000's 2780/3780 emulator, which automatically converts the data into a form acceptable by the 370.

No program changes are necessary — only minor changes in the job control cards, Rixford noted. Processing results are sent back over leased lines to the small system in the form of print files.

The initial HP 3000 configuration consisted of a 256K-byte Series II processor, a 47M-byte disk, a 600 line/min printer, a 1,600 bit/in. tape, a card reader, a card reader/-punch, five HP 2640B terminals and the HP 2640A operator's console. Additional terminals and a 50M-byte disk were added later.

The system uses the Image data base management system and Ksam with Cobol, Basic and RPG-II, as well as the Data Entry Language (DEL), an aid that allows programmers to design, create and modify terminal screens in any format.

Two On-Line Systems

During the first year, while the production control and financial systems continued to be run on the 370 through the HP 2780/3780 emulator, the Irrigation Division developed two on-line systems: distribution and inventory.

The distribution system, which is sales-oriented, allows sales department personnel to generate a thoroughly edited sales order using an on-line terminal. Input errors are virtually eliminated, Rixford said.

Product substantiations and pricing are done automatically, as are customer acknowledgements, shipping papers and the updating of the open order file. When the goods are shipped to a customer, the shipping information comes back onto the system, and invoicing and any necessary back ordering take place.

The inventory system is used mainly by production control, warehousing and manufacturing. The system displays work-in-process and finished goods inventory status, which shows what is on the division's shelves; shop order and purchase order status, which tells what the division is building or purchasing; sales order status, which shows the current demand for the product; and stock status, which shows the historic de-

(Continued on Page 59)

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Disk Care Detailed

CHATSWORTH, Calif. — A guide to the care, cleaning and handling of disks and heads in Pertec Computer Corp. disk drives is available from the firm's Pertec Division.

Presented in four chapters are step-by-step instructions for the care and cleaning of disk drive heads and disks, recovery from head crashes and disk and head handling.

The 12-page booklet, tailored to the disk drive user who is not technically oriented, also includes suggested cleaning supplies, preventive maintenance directions and clarification of terminology.

Copies of "Care, Cleaning, and Handling of Disks and Heads for Pertec Disk Drives" are available from Pertec Computer Corp., Pertec Division, MS 40/04, 9600 Irondale Ave., Chatsworth, Calif. 91311.

Interdata 8/32 Gets Fortran VII

(Continued from Page 55)

piled, linked, loaded and executed with a single command, the firm said.

The Fortran VII 8/32 systems were designed for universities, government agencies, military and aerospace organizations or any Fortran user involved in scientific research, simulation, industrial automation or data acquisition, according to the spokesman.

Previously, Interdata's Model 8/32 megaminis were available with Fortran VI. Fortran VII "takes programs that have run on our 32-bit processors and executes them in half the time," the spokesman noted.

The Fortran VII 8/32 system with 512K bytes of main memory is priced at $89,900. The 768K-byte system costs $134,000 from the Interdata Division of Perkin Elmer at 2 Crescent Place, Oceanport, N.J. 07757.

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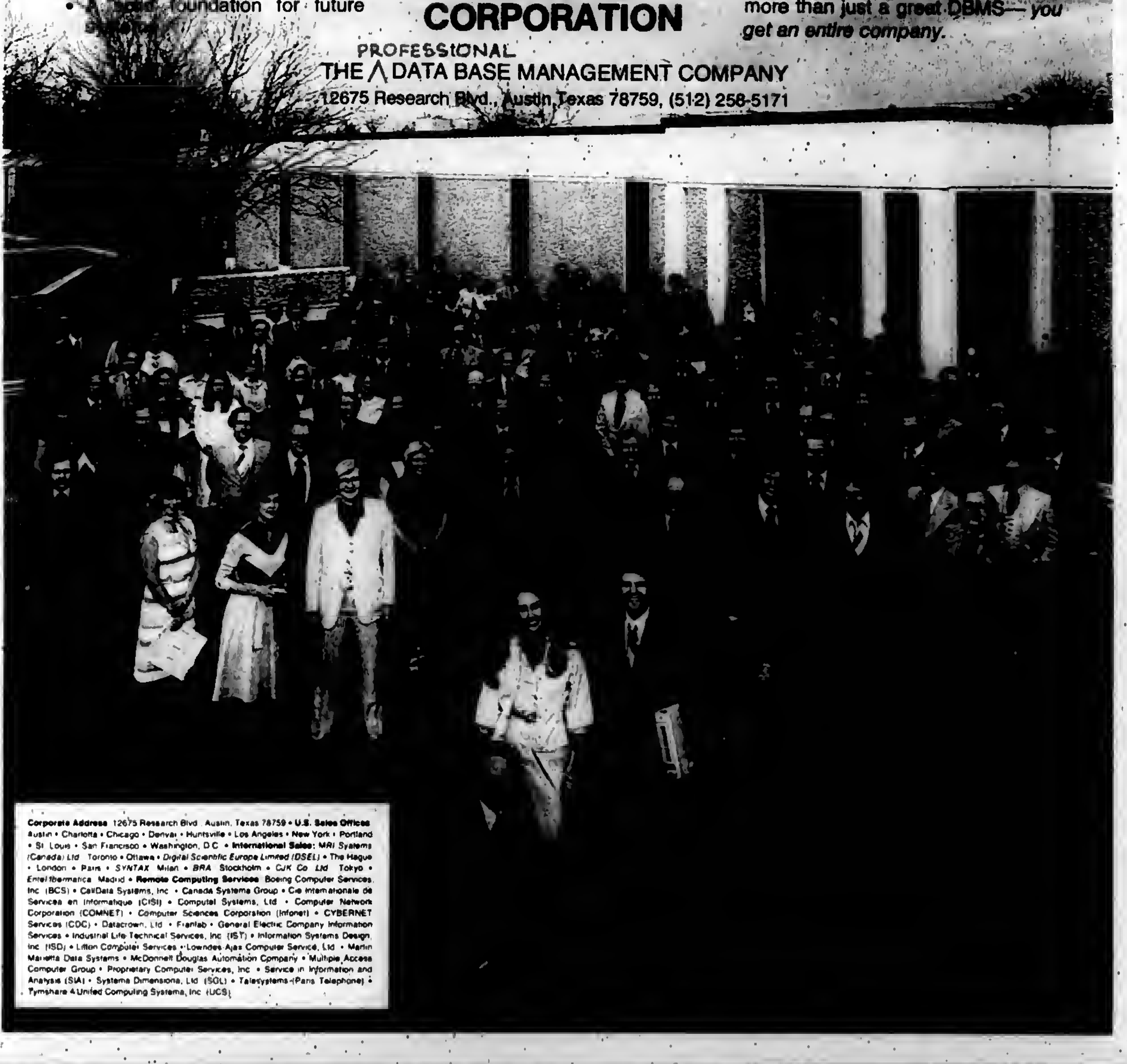

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- Data Base Design and Administration (2 days)
- Application Analysis Methods (2½ days)
- Report Writer Fundamentals (2 days)

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By special arrangement, MRI will also conduct classes at customer sites or in other cities. In the customer site classes, the instructor tailors the standard courses to deal exclusively with the student's own hardware configuration, operating system, and data management facilities.

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Board Gives GA Users Up to 64K of Memory

SANTA ANA, Calif. — Trendata/-Standard Memories has announced a semiconductor memory module for General Automation, Inc. 16/110 and 16/220 minicomputers.

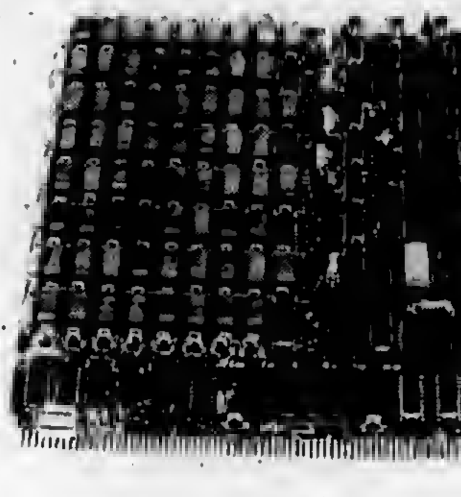
The Pincomm AS offers 350 nsec access and 450 nsec cycle times. It utilizes 16K by 1 MOS storage devices and is available in 16K-, 32K-, 48K- and 64K-word capacities, the firm said.

The amount of memory to be addressed and its starting address are both switch-selectable in 16K increments for ease of system configuration, according to a spokesman.

Parity is performed on a word basis, with all functions equivalent to GA memories, the firm said. Two LEDs indicate when either a data error or instruction error has occurred.

A 16K-byte Pincomm AS memory costs $1,364, a 32K-byte unit costs $1,864, a 48K-byte unit costs $2,391 and a 64K-byte memory costs $2,954.

Trendata/Standard Memories is located at 3400 W. Segerstom Ave., Santa Ana, Calif. 92704.



Pincomm AS

Irrigator Links Business System, 370/145

(Continued from Page 57)

mand and current availability of parts and finished goods.

To support these applications, the division, as Rixford puts it, "had to get into the data base business." The distribution data base is made up of the customer master, item master, open order file and several control files.

The inventory system uses its own data base plus the distribution data base. The inventory system looks in the distribution data base for part descriptions, customer names and all open order sales data.

Second-Year Projects

"Once the first two applications were up and running," Rixford said, "we were able to come up with some very lucrative results for very little added work. In fact, the HP3000 system has already paid for itself."

One important enhancement involved the expansion of the distribution system to produce pick lists. The shipping supervisor uses an on-line program to develop a complex set of rules for selecting and prioritizing orders form the open order file.

The system then applies available inventory to these orders and produces the appropriate pick lists. The pick lists, which are sent to the shipping warehouse, tell the order pickers the exact shelf location where they can find the product.

In addition to the expansion of the two systems, the Irrigation Division has developed some "high payoff" applications, Rixford said. In the operational aids area, for instance, the division developed programs for engineering change effectivity control, production hours forecast, inventory analysis, distributor sales analysis and open order analysis.

In the managerial aids area, the division developed applications for sales history analysis, order statistics, shipping statistics and warranty analysis.

To date, the HP 3000 can be accessed through 13 terminals. There are two terminals in the production control area, one in the manufacturing offices, one in the work-in-process warehouse, two in sales, one in the finished goods warehouse, one in international sales, two in program development and three in the machine room — an on-line data entry terminal, the RJE terminal and the operator's console.

Personnel in the Irrigation Division log onto the system by themselves and call up the programs they want to use quickly and simply, Rixford said. All program development is done on-line. The system's real-time multiprogramming executive operating system is designed to allow use of the system resources by a variety of users.

One of the features that Rixford feels has been helpful in the division's rapid development of on-line systems is DEL. This software includes a forms maintenance program for screen creation, updating and deletion, as well as procedures for data editing and terminal manipulation.

Rixford uses this software, along with a simple driver he developed, to model the operation of applications before spending time and money in actually programming them.

"The language allows us to accurately model the user portions of an application with a very low investment in time and effort," he noted. "As a result, we can iron out user interface problems before any programming begins and can speed up development."

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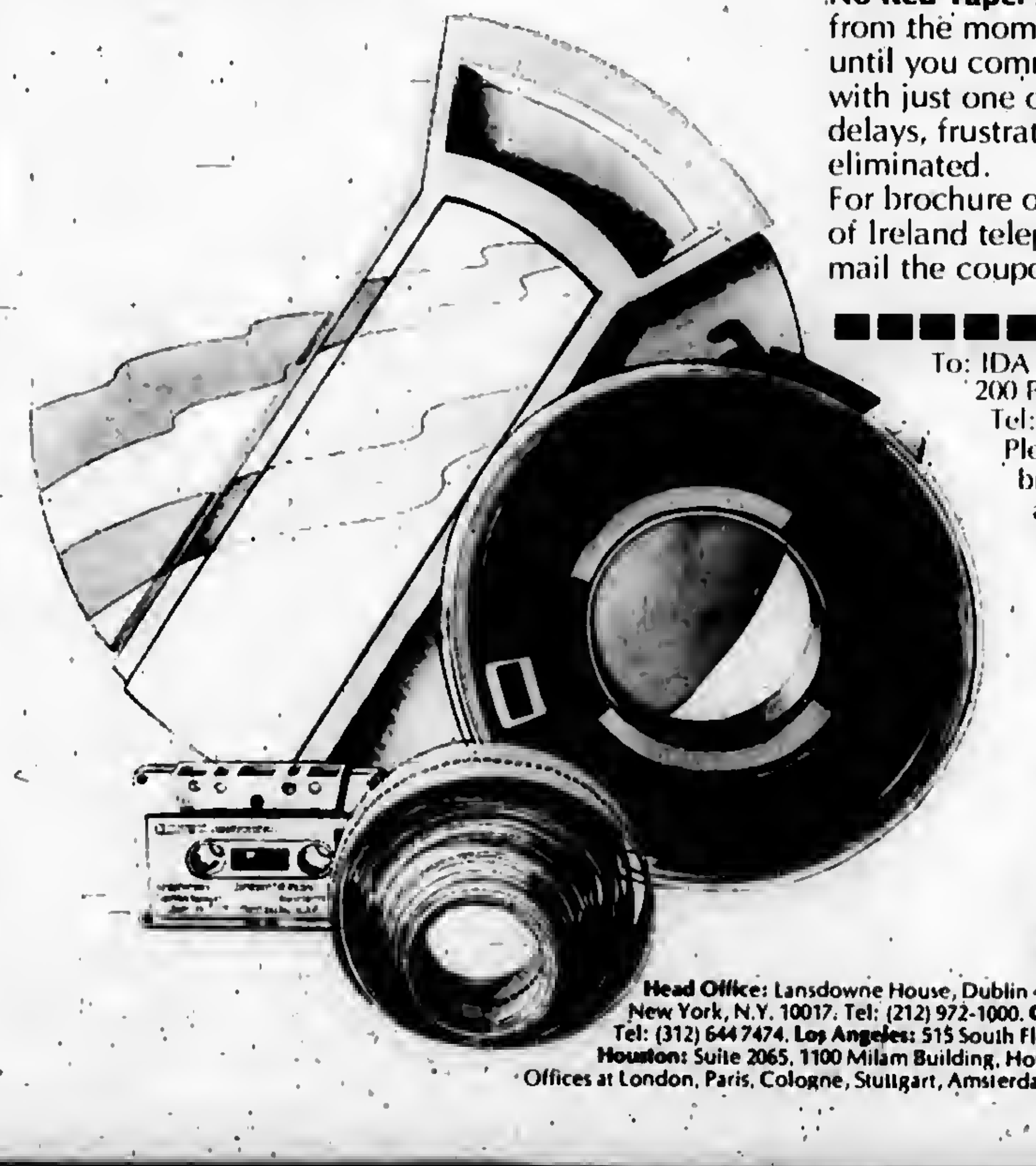


Adventists' Mini Simplifies General Ledger

(Continued from Page 55)

which comprise the southern conference.

Friday and the three staffers operate the DP shop which produces a weekly-payroll for 500 persons including 200 pastors and associated pastors as well as 107 school teachers. The shop also handles DP for two Adventist bookstores.

"When I arrived in 1973," Friday observed, we had payroll and accounting on an IBM System/3 Model 6, which was updated to a Model 8. Both were strictly batch systems.

"We wanted to get away from time-consuming batch processing and allow the payroll department to input data directly on an interactive system for more rapid turnaround." At that time the IBM system was pushing its limit, Friday added.

Investigation Begins

He started investigating Wang's equipment at the 1975 Computer Caravan at the Los Angeles Convention Center. While looking at a data entry device for the System/3 that would check batch totals of receipts on-line, he stopped at the Wang exhibit.

Subsequently Wang announced the Wang VS. Friday attended a seminar and demonstration the week of the announcement. Then, following the lead of the Adventists' Union Office, the Southern Conference also signed up for Wang.

Two Adventist programmers confer about combining three large programs.

Friday is impressed with the machine's on-line interactive capability. Now the DP department can easily answer general ledger questions.

"Our assistant treasurer was perpetually asking me to perform inquiries to particular accounts on his general ledger under the old system," Friday recalled. The Wang system's capability "allows immediate display of the general ledger. I have even written a program he can use for on-line inquiry."

The debug utility is also important to Friday. "I can look at the source program while the machine is running, find out what's wrong and get the bugs out of the program," Friday explained. "This is very unusual for a computer this size, and it saves a great deal of time," he added.

Simple Conversion

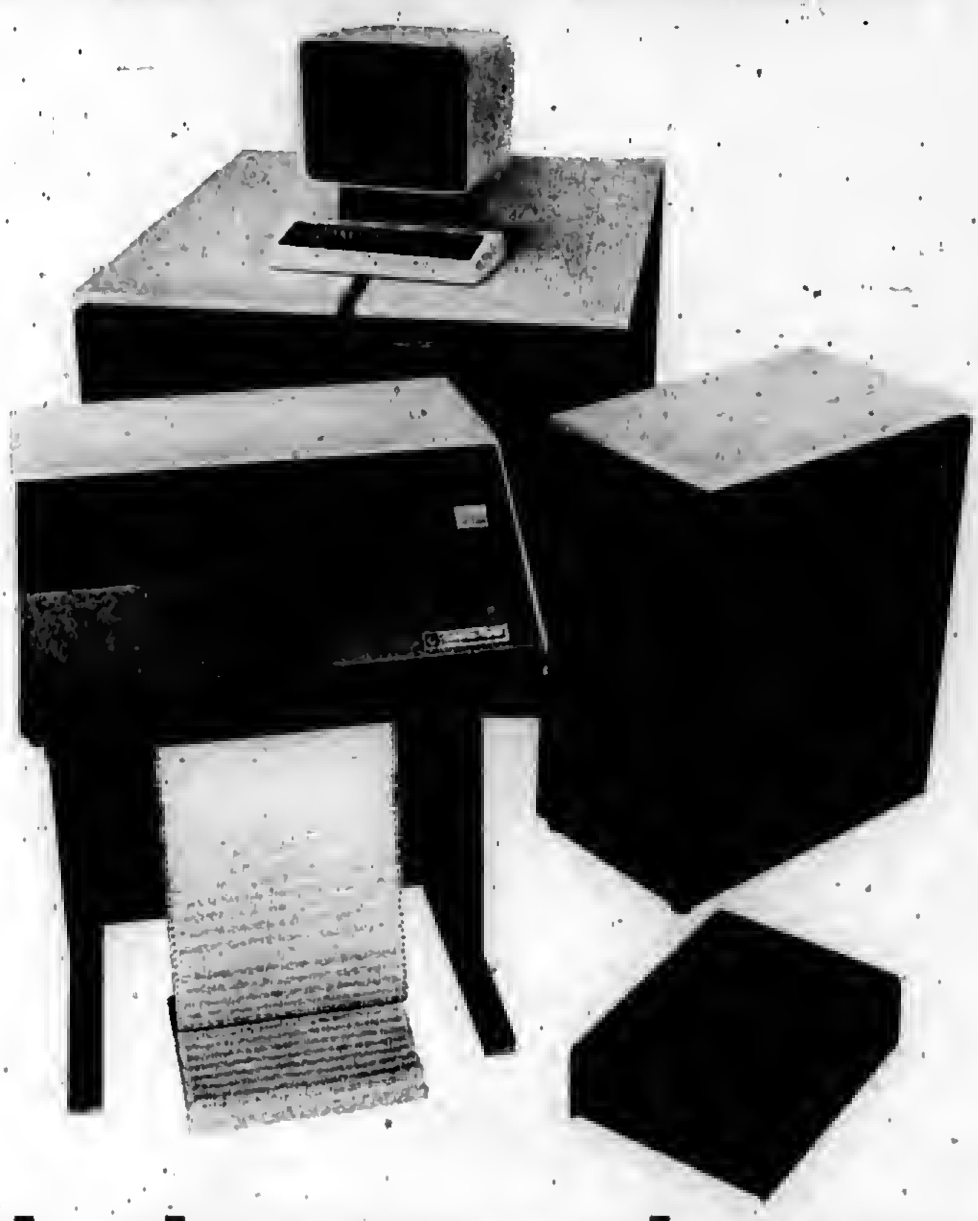
The Southern Conference plans to use all the languages offered in the Wang mini. The shop was able to easily convert its 250 programs to the system, and Friday expects to shift to Cobol as time goes on. Basic will be used when the church's union office sets up a telecommunications and data entry trust accounting package for all the conferences.

Friday is also pleased with the CRT. "With the IBM system, in order to design a screen display, you had to get a piece of paper, write down your field descriptors and then enscribe your field," he pointed out.

Cost justification is also evident to Friday. "With the IBM System/3, we paid $2,400/mo. We didn't have CRTs; we didn't have our membership on-line; we didn't have the utilities; we didn't have three languages; we didn't have telecommunications capability; we didn't own the system — and we had only 1/30th the storage," he remarked.

"By depreciating our Wang VS over five years, the projected cost including tax and maintenance is $3,000/mo," he said.

Computer Optics announces a new 3270 feature.



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'Great Merchandising Tool'

Mobile Home Becomes Micro Showroom

By Ann Dooley
CW Staff

S. PORTLAND, Maine — Trying to get prospective buyers out of their offices and into a computer showroom is "like pulling teeth," according to Al Dussault and Don Turner, so instead the partners decided to bring the showroom directly to the buyer.

Turner and Dussault, owners of the Computer House, decided that the best way to exhibit their product line of micros and minicomputers was to transport the equipment via a mobile home to prospective buyers' front doors. The traveling computer salesmen cover a 25-mile radius in rural Maine and say that this way businessmen are "eager to come out," both because of the novelty of the idea and to seriously inspect the equipment.

"It's a great merchandising tool. Once the initial contact has been made, usually over the telephone, we pay a visit by driving the mobile home to the businessman's office and inviting managers in for on-the-spot demonstrations," Turner said.

"We've had people walk in with no connection to the group we were talking with and show interest in buying some equipment, and we've even had offers to buy the mobile home," he added.

The response has been tremendous, primarily because of the van's appearance — people just don't see something like that every day, he noted.

Don Turner (at keyboard) and his partner Al Dussault (far right), owners of the Computer House of South Portland, Maine, show off an Infotecs IMP microcomputer installed in their mobile office. Looking on are Calvin Holt (left), vice-president for Marketing, and Edward Tolson (second from left), president of Infotecs, Inc. of Manchester, N.H.

The Computer House, a franchised affiliate of Infotecs, Inc. of Manchester, N.H., demonstrates Infotecs, Digital Equipment Corp. and Olivetti Corp. equipment.

The motor home was designed to be plush, according to Turner, who explained that the sink, stove and dinette were removed and wall-to-floor-to-ceiling carpeting installed to give the van a living room effect. The van carries its own "clean power" so the equipment can be demonstrated anywhere.

Since most of the gear uses floppy disks, the environment doesn't have to be as closely controlled as in large computer rooms. "smoke or dust doesn't bother the machinery and that's exactly the point we want to make to these small businessmen who don't have the space to set up a separate computer area," Turner said.

This direct "on-wheels" approach has been successful for Turner and Dussault in the year since they have been driving their computer house around the Portland area. Infotecs named the house "outstanding dealer of the year" for selling more computer systems than any other dealership in the country.

The idea for the traveling showroom came from IBM, Turner said, noting that at one time that company used a similar approach. "We figured if IBM could do it, so could we."

In addition to hardware, the Computer House also features software for general ledger, order entry, payroll, job costing, income tax preparation, voter registration and several other business applications. All software is written in Hybol/Dybol or Basic.

The Computer House can demonstrate any of the equipment, depending on customer's needs. Several of the micros can fit in the house and are movable whenever necessary, he said. The various systems include the Infotecs Instant Management Power (IMP) microcomputer with a CRT, printer and MPU; DEC's 201 and 202 word stations, the data station 78 and PDP-8 (all sold on an OEM basis); and several pieces of Olivetti equipment.

The whole idea of the Computer House is to get the businessman away from his telephone. Once he's involved with the equipment demonstrations, it's often hard to tear him away, Turner noted. Some people try using it themselves and spend hours experimenting with it, and he emphasized, that's what makes for sales.

System Uses Basic, Assembly; Suits Control, Personal Uses

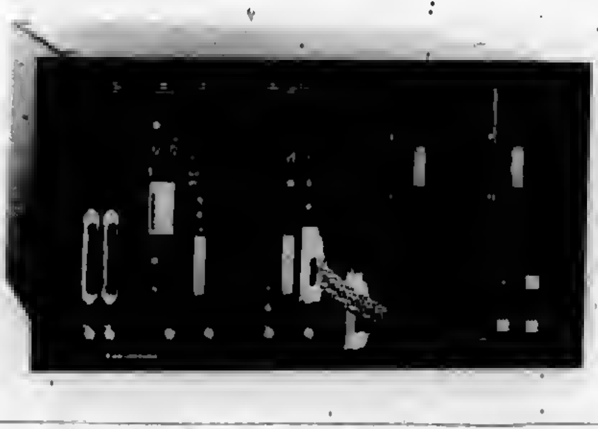
LOCKPORT, Ill. — Kinetic Systems Corp. has introduced a stand-alone microcomputer system, the Camac mini crate, that can be programmed in Basic or assembly language and can be used for business, personal or control applications.

The Camac is a version of the company's 8010 microcomputer system and, because of the system's modularity, it can be configured for "nearly any application," the firm said.

Communications between the microcomputer and the modular components of the 8010 system is via a microcomputer peripheral bus that supports up to 64K bytes of random-access memory (RAM) and erasable programmable read-only memory (Eprom), diskette drives and as many as seven crate controllers and their associated crates of process I/O modules.

The Camac mini crate version of the 8010 reportedly offers all the power of the standard configuration in a smaller package containing 12 stations.

The system costs $4,695 and up depending on the configuration, from 11 Maryknoll Drive, Lockport, Ill. 60441.



Mini Crate Version of Kinetics' 8010

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Personal System Boasts 13-In. Color CRT

NORCROSS, Ga. — Compucolor Corp. has unveiled the Compucolor II, a personal computer available in five models.

All models come equipped with a 13-in. color CRT, eight background and foreground colors; all editing features and a built-in single mini disk drive with 51 K bytes of storage with Disk Basic.

The models range from a 4K random-access memory (RAM) version with a 16-line by 64 char./line format to one with 32K RAM and featuring a complete graphics package, a 32-line by 64 char./line format, an RS-232C interface and a 72-key keyboard.

The Model 3, with 32 lines and 8K of memory, graphics and RS-232C interface, retails for $1,495. The Model 4, featuring a 32-line format, 16K of memory, graphics and RS-232C interface retails for $1,795, and the Model 5, with 32-line format, 32K of memory and graphics, retails for $2,395.

The Model 1 with a 16-line format and 4K of memory and the Model 2 with a 16-line format and 8K of memory retail for $795 and $995 respectively and will not be available until February, Compucolor said.

Compucolor Corp. can be contacted through P.O. Box 569, Norcross, Ga. 30071.

Memory, I/O Peripherals Offered for Intel MCS-85

SANTA CLARA, Calif. — Intel Corp. has introduced three high-performance memory and I/O peripherals for the MCS-85 micro system. The peripherals and the recently introduced 8085A-2 CPU allow the performance of 8085A systems to be upgraded from 3MHz to 5MHz, the firm said.

The devices are the 8355-2, featuring 16K of read-only memory (ROM) with two programmable I/O ports, and the 8155-2, each containing 2K of static random-access memory (RAM) with three programmable I/O ports and a 14-bit programmable counter/-timer.

The devices plus the 8085A provide a three-chip micro system that operates more than twice as fast as other systems, the company claimed.

It contains a CPU, 256 bytes of read/write memory, 2K bytes of program storage, 38 programmable parallel I/O lines, serial I/O ports, system clock, system controller, multilevel maskable vectored interrupt control and a programmable interval timer and event counter, the firm said.

The 8155/56-2 device costs $30 in single quantities and the 8355-2 is $21.55 in quantities of 250 from Intel Corp., 3065 Bowers Ave., Santa Clara, Calif. 95051.

Cassette Tape Suits Micros

PALMDALE, Calif. — Racet Computes has introduced a special-formulation cassette tape optimized for microcomputer applications that will reduce problems such as lost programs, noise and extraneous bits of information in programs and the sensitivity of a system to critical volume settings, according to the company.

The Microcomputer Tape features a broad frequency range, "exceptional" density characteristics, consistency in recording and five-screw shells with lubricated liners, according to the firm.

C-20 cassettes cost $14.95 for 10 and $119.95 for quantities of 100 from Racet Computes, 702 Palmdale, Orange, Calif. 92665.

Computer Store Adds Three Outlets On East Coast

BURLINGTON, Mass. — The Computer Store, Inc. has opened three franchised outlets in Hartford, Conn., Rochester, N.Y., and Tampa Bay, Fla.

Begun three years ago, The Computer Store, Inc. now has six operating outlets. The stores act as suppliers to commercial users of small computers and carry Data General Corp.'s Micronova as well as Cromemco Corp. and Apple Computer, Inc. microcomputers.

Bit Pad Gets Link to TRS-80

FAIRFIELD, Conn. — Summagraphics is now offering an interface for the company's digitizer, the Bit Pad, to the Radio Shack TRS-80 microcomputer.

The interface permits the entry and transfer of X-Y coordinate values for graphics and data entry applications from the Bit Pad to the TRS-80.

The device includes a cassette for loading of the operating program to permit transfer of data. In addition, the interface allows use of all other TRS-80 accessories, the firm said.

The unit costs $175 from Summagraphics at 35 Brentwood Ave., Fairfield, Conn. 06430.

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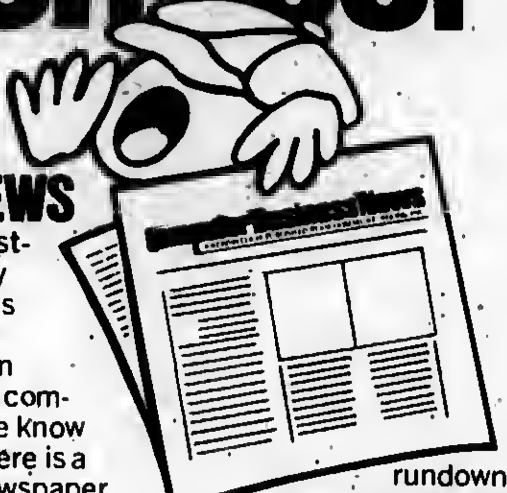

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Computer Business News

Expands Small Systems Products

HP Marks Mid-Range Turning Point

By Jeffry Beeler
CW Staff

CUPERTINO, Calif. — With last week's addition of two mid-range offerings to its small systems line, Hewlett-Packard Co. signaled a turning point in its development as a business computer supplier.

Since 1975, when it introduced its first small business system — 3000 series — HP has enlarged its share of the domestic computer market to about $600 million, wilh commercial DP offerings accounting for 35% to 40% of that total, according to Paul Ely, vice-president and general manager of the Computer Systems Group. But even as sales of the 3000 series jumped an average of 50% each year, HP market strategists recognized they could not sustain that growth rate indefinitely with a small systems line consisting of only one model.

Earlier this year the firm began broadening its business systems family, first with the introduction of the bottom-of-the-line Model 250 system and the top-of-the-line 3000 Series III and then last week with the announcement of two additional systems — the Model 300 and the 3000 Series 33. By increasing the variety of its small systems offerings, HP is aiming to ensure that the business computer sales growth it has enjoyed during the past three years will continue at roughly the same rate well into the 1980s, Bill Krause, marketing manager of the General Systems Division, explained.

End of First Phase

In Krause's view, HP's two latest product announcements mark the end of the company's first phase of development as a small systems supplier. During that phase, which began three years ago, the firm's efforts to gain a toehold in the commercial systems sector resulted in the formation of General Systems, which produces and markets small systems for nontechnical users.

The company also focused on expanding its business systems line as well as its family of data entry, storage and output peripherals. At the same time, HP bolstered its worldwide marketing and field support organization. In short, the first stage laid the groundwork for the firm's transition into the second phase of its development as a business systems vendor.

Slated to begin in early 1979, this next evolutionary stage will coincide with the introduction of a second-generation of HP small business products that will allow the firm during the next three to five years to exploit market opportunities that its current generation of commercial DP offerings uncovered but only partly explored, Krause said.

As HP's commercial systems effort evolves during the next three to five years, the company will concentrate primarily on broadening its applications software library as well as its repertoire of small systems hardware, Ely predicted. Moreover, the firm plans to further strengthen its global field support

(Continued on Page 64)

Lessees Now Seek Lessors With Remarketing Skills

By Robert E. Applegate
Special to CW

Users considering lease financing of DP equipment through third-party lessors have always considered the monthly lease rate the single most important element in selecting a lessor. However, in recent years, as the resale value of installed computers moves directly in relation to planned and actual new systems availability, lessees added several other factors to their list of primary considerations.

These included the extent to which residual value curves can be protected, the ease with which a lease permits upgrades to new equipment and the strategy for employing both investment tax credit passthrough and purchase-option credit buildup to obtain the maximum financial benefit with the minimum risk from a lease.

Today, there is still another capability a potential lessee should look for in a lessor; a strong remarketing capability.

Remarketing is a technique lessors use to ensure that their lease clients can obtain the maximum return on the value of currently installed equipment when they plan to replace it.

The more the lessor can get when he resells old equipment, the lower the net cost to the lessee when he upgrades to new hardware.

The remarketing of used equipment has grown to be an enormous part of the computer industry. At its recent annual meeting in Bermuda, for example, the Computer Dealers Association — a trade association of companies which buy and resell used equipment — increased its membership 25%, to 80 members. A look at the classified section of trade publications provides further evidence of this trend.

Now when a user wants to obtain a leveraged lease for a system, he has to evaluate the remarketing capabilities of the lessor besides the usual low rate, total financing capability and protection factors.

Need for Skill

The most obvious reason strong remarketing skill is important comes at that point, midway through a long-term lease, when the user wants to upgrade to the new Superdooper/Two. To do so, he obviously must get rid of his current Superdooper/One. Since the current monthly payment was based partly upon the projected value of his current equipment over its lease life — the residual value curve — the point at which the user elects to upgrade has a specific effect on what his new lease payments will be.

(Continued on Page 66)

Suit Sparks Announcement

National Semi Planning Mini Compatible With PDP-11/34

By Marcia Blumenthal
CW Staff

SANTA CLARA, Calif. — National Semiconductor Corp. has announced its intention to produce a minicomputer line — the Series 200 — completely compatible with Digital Equipment Corp.'s PDP-11/34.

To clear the way for marketing the product in early 1979, National Semi has filed an action against DEC asking for a ruling that various DEC patents are invalid and unenforceable and that National Semi has not infringed on those patents. The action was filed in the U.S. District Court for the Northern District of California.

Based on past actions by DEC, according to National Semi's legal counsel, John Webb, there is reasonable concern that DEC will file a patent infringement action against National Semi. Four specific patents are discussed in the action.

The lawsuit is a means of clearing the way for making the Series 200, a National Semi spokesman said. "However, the two are not necessarily linked; we will market the product anyway because who knows how long the case will drag out, unless DEC gets an

(Continued on Page 64)

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Mid-Range Systems Signal Turning Point

(Continued from Page 63)

organization.

Like most of its competitors in the small systems sector, HP regards distributed processing as the keystone of its business computer marketing strategy during the coming years. Unlike most other small systems suppliers, however, the Palo Alto, Calif.-based firm plans to limit its marketing effort to configurations in the $10,000 to $250,000 price range, Ely said. Many of the firm's rivals in the business computer market, by contrast, already offer or will soon announce small systems costing as much as $400,000 to $500,000, he noted.

HP's tactic of restricting General Systems activities to a relatively narrow sector of the commercial systems spectrum will allow the firm to sharpen the focus of its computer-related research and development effort, Ely added.

HP's business DP marketing strategy also differs from that of most of its competitors in its approach to systems design. Whereas many of its rivals market systems that are little more than modified versions of their general-purpose offerings, HP has designed its business systems "from the ground up," Krause explained.

"When you compare our business and general-purpose systems, you can immediately tell the difference," he said. "Not only do the business systems look completely. different from our other lines, but they also have built-in features that make them easier for business users to operate than our scientific or engineering minis."

The differences between HP's general-purpose and business system designs reflect what the company sees as a fundamental change in the way major categories of small systems hardware are defined. "The dividing line between traditional classes of equipment are becoming more and more fuzzy as time goes by," Krause noted. "Today, systems are distinguished not by conventional notions of what separates one class of hardware from another, but by the applications they perform."

Accordingly, HP has restructured its business systems marketing philosophy to stress not the sale of general-purpose machines, but of systems designed to solve well-defined applications problems, Krause said.

National Semi Planning to Market Mini Compatible with PDP-11/34

(Continued from Page 63)

injunction against us," he added.

Pointing to various alternatives such as licensing agreements, the spokesman indicated the case may not necessarily end up in the courts.

Not Many Details

Pricing and distribution strategies and other product information on the Series 200 will not be announced until late this year. "The only reason we announced what we are doing at this time is because we filed a suit. We are giving analysts and the press and everyone else a synopsis of what's happening," the spokesman said.

However, the spokesman did say that the mini line will be marketed to large users in OEM quantities. The Series 200 will be the first plug-compatible computer National Semi will market to the user, the spokesman said, noting that the company currently supplies plug-compatible IBM equipment to Itel Corp.

While stressing again that the company will not define its strategies until later this year, the spokesman said there are prototypes of the computer and National Semi has started manufacturing it. No Series 200s are in the field yet because the company is still surveying the market.

"We feel expansion into plug-compatible machinery is a natural for integrated circuit makers," the spokesman said, adding that the mini is part of National Semi's ongoing plug-compatible strategy.

On the East Coast, a DEC spokesman said that company's lawyers had not had a chance to "thoughtfully review" the legal documents. Moreover, since details of the product were not available, DEC could make no further response, he said.

However, DEC is confident its patents are valid, the spokesman emphasized.

Communications Topic of Bulletin For Executives

BROOKLINE, Mass. — *Intel-Trade* has been launched as a newsletter reporting on international activities in the telecommunications industry.

Marketing information, procurements, financial trends and key participants in the telecommunications industry will be the subjects of the newsletter, which is aimed at assisting high-level executives in assessing market conditions.

Subscription Rate

The subscription rate for the newsletter, published every two weeks, is $300. An introductory discount of one-third off the regular price is available until Dec. 31.

Further information is available from Information Gatekeepers, Inc., Suite 212, 167 Corey Road, Brookline, Mass. 02146.

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To Reflect Specialization

Signetics Reorganizes Industry Sales Group

SUNNYVALE, Calif. — The increased complexity of the computer industry and the growing number of multinational companies were the major factors in the recent decision to reorganize the Industry Sales Group at Signetics Corp.

Headed by Robert Lanford, the reorganized group will stress industry specialization, with three distinct sales organizations: EDP, commercial and military. In addition, the group will expand its customer support and applications engineering activities.

As a result of the company's recently completed analysis of the semiconductor industry, Lanford said, "We have clearly determined there is a group of mature industry markets that need to be serviced by specialists who understand the present and future integrated circuit (IC) requirements of individual industries and the technical demand of specific applications. Organizing to meet these needs is a departure from the typical semiconductor sales organizations, which are structured according to types of products or process technologies."

Lanford, who is responsible for implementing the organizational change, maintained that the computer industry is now essentially several industries, each with specialized IC requirements.

Pointing to the minicomputer, magnetic memory, floppy disk and terminal segments, Lanford said the sales force not only has to sell products but now also has to design assistance for products two or three years in the future.

Multilocation Emphasis

A major focus of the EDP sales organization will be multilocation, multinational customers. "EDP customers now typically manufacture a variety of equipment in several locations," Lanford explained." They have some common circuit requirements throughout the product line and some special requirements.

"Inventory management is what has killed our industry over the past five years," he declared. Accordingly, the industry sales group and support staff have been strengthened, with additional staff coordinating orders "throughout various buying locations of customers."

As the customer's business physically expands, he doesn't realize what he needs in every location. "We can make sure the customer does not have excess inventories and we can now track shipments to him more carefully," Lanford noted.

The organizational plan is not unique, he said, pointing out that other companies have tried the industry specialization structure over the past five to 10 years. "It's a plan a lot of companies would have liked to have carried out, but never bothered to staff accordingly," Lanford said.

When fully staffed, Sigmetics' EDP sales organization will include 15, salespeople and will account for 40% of all personnel in the Industry Sales Group.

EDP sales is headed by Clay Marr. Marr has held the position of EDP sales manager for more than a year. The group is also being expanded with the addition of David Duncan as key account manager. Duncan recently joined Signetics from Elmar Sales, an electronics distributor.

Floating Point Shares Sell Out Quickly

NEW YORK — The initial Sept. 28 public offering of 750,000 common shares of Floating Point Systems, Inc. stock sold out quickly. By the end of the day's over-the-counter trading, the stock's price had jumped from $18 per share to about $26.50 per share.

Part of the proceeds of the stock offering will be used to pay off short-term debt and finance a new building.

The company sold 588,284 shares and certain stockholders sold the remaining 161,716 shares.

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NCR Board Approves Acquisition of Quantor

DAYTON, Ohio — The board of directors of NCR Corp. has approved the proposed acquisition of Quantor Corp. by NCR.

Under the terms of the proposed acquisition, NCR would pay holders of Quantor common stock $3 per share in cash. Holders of Quantor's Series A preferred stock would receive in cash the liquidation value plus accrued dividends on their stock which would be approximately $1,550,000.

The acquisition is subject to final approval by Quantor shareholders at a meeting scheduled for mid-November.

"The acquisition of Quantor is designed to provide the nucleus for NCR's future expansion in computer output microfilm systems and in the micrographics field in general," according to William S. Anderson, NCR chairman.

"Quantor would, under its current management, operate as a micrographics development, manufacturing and marketing entity reporting as a part of NCR's Systemedia Group," he noted.

NCR and Quantor announced agreement in principle to the proposed acquisition on Aug. 1.

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Users Now Seeking Lessors With Remarketing Ability

(Continued from Page 63)

Obviously, the asset depreciates the longer it is in service, but the nature of the new series of equipment may alter the residual value curve, making the current asset less valuable.

Current generations of installed equipment tend to hold their value very well during the first few years of service, but they take a sharp drop — perhaps 20% — when the next generation is announced. Several months before first deliveries of new-generation hardware, there is usually another steep decline in value and then a continuous, if not steady, drop over the remaining useful life.

This pattern was followed by the IBM 360 and now by the 370 systems as newer generations were first announced and then delivered 12 to 18 months later.

Six Services

Obtaining the maximum price for used equipment — and therefore the most favorable rate when the new equipment goes on lease — a lessor with strong remarketing capabilities can be helpful to the user in six specific ways:

- *By providing "current value" monitoring.* By working in the used equipment market every day, the lessor not only knows the current value of various systems on a daily basis, but also has a feel for where market values are heading. As a result, he can advise clients on the timing of resale transactions.
- *By providing "future value" projections.* Forecasting residual value curves over both the leased life and the useful life of computer assets has been a less than perfect art in the past, as many lessees have discovered when trying to upgrade midway into a long-term lease.

A strong remarketer, however, can constantly adjust value curves so a lessee has better data for making timing and upgrade decisions. This assures a "no surprises" approach to asset management.

- *By providing short-term solutions to equipment requirements.* Increasingly, users find themselves adding to installed equipment to sustain its performance for a longer period of time. Sometimes such additions —memory, disks, I/O devices — are needed immediately. Often, a good remarketing lessor can obtain needed equipment in the used equipment market very rapidly and at far less cost than from the hardware vendor. In this way, the lessee gets the benefit of additional options to consider.
- *By locating the best buyer.* This is not always possible because of timing and other constraints, but a lessor whose presence in the used equipment market is strong very often has relationships with end users as well as finders and brokers.

Invariably, direct selling from one user site to another, without middlemen, returns the highest resale value against a lease upgrade.

- *By acting as a single-source expediter.* Used equipment must be removed from a user site, often reconfigured by adding or deleting options and recertified as to its maintenance status by the hardware vendor. It then must be moved to the new user's location.

A lessor who is also a remarketer has the systems and capabilities in place to execute these procedures smoothly.

- *By strategic counseling.* Elements of a lease, such as optimizing the timing and use of purchase-option credits, preserving investment tax credit via a sublease, sales tax considerations and lease terms and conditions, can often mean a swing of several hundred thousand dollars on a major lease transaction. The lessor with remarketing capability can gain every cent of advantage possible for his client by advising and counseling him on the best ways to manage such factors.

These are just a few of the principal advantages that a user can realize when planning to install equipment on a lease basis.

The lessor who has a strong presence in the used equipment market, who buys, sells, warehouses and works within the market every day, is increasingly capable of putting together a better total lease package than the lessor who perceives remarketing as far too difficult and complex a task.

Applegate is director of remarketing for Finalco, Inc., a lease underwriter.

Expansions

Data Terminals and Communications has begun construction of its new 25,000 sq-ft manufacturing facility and headquarters at 590 Division St., Campbell, Calif. The $1.5 million facility will double the size of the present facility.

Dynabyte, Inc. has moved its headquarters to 1005 Elwell Court, Palo Alto, Calif. 94303. The facility will house administrative, engineering, final production and testing functions.

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Memorex Sets Up Centers To Centralize R&D Effort

SANTA CLARA, Calif. – Memorex Corp. has centralized its research and development effort by establishing two corporate technology centers here.

The Recording Technology Center and the Magnetic and Chemical Technology Center are responsible for long-range research over the spectrum of emerging memory technologies. In addition, the centers will evaluate the commercial feasibility of specific technologies.

Until the establishment of these corporate-level centers, R&D at Memorex had been carried out primarily at the divisional level. The R&D work done at the corporate level will benefit all Memorex divisions, a company spokesman said.

Memorex's Recording Technology Center, under the direction of Frank Sordello, is responsible for digital recording technology for rigid and flexible disk drives and tape drives for both the large and small computer systems markets.

Sordello noted that his center is also charged with monitoring all technologies that may have future applications in digital recording hardware. Of particular interest to this center are thin film heads and media.

The Magnetic and Chemical Technology Center, headed by Eric Daniel, will focus on developing technology for products such as computer tape, disk packs, cartridges, flexible disks and an expanding line of word processing supplies.

Analysis and development of advanced chemical formulations and surface coating are the center's special areas of interest.

To assure the success of this corporately sanctioned venture, Memorex has allotted separate space to the centers and has made a sizable investment in equipping them, a company spokesman noted.

In the past five years, Memorex has increased its in-house R&D investments more than 300%. In 1977, for example, the total engineering staff was expanded by more than 40%, the company pointed out.

Canadian Systems Total Almost 7,000 Last Year

TORONTO – The number of computers installed in Canada totaled 6,799 as of May 1, 1977, up 14.5% from the previous year's 5,397 units, according to the recently released *Canadian Computer Census* published by the Canadian Information Processing Society (Cips).

While IBM's share of the total installations declined from 28% to 25% over the most recent reporting period, it captured 65% of the rental market for systems in the $20,000-and-more-per-month.

Digital Equipment of Canada, Ltd. increased its share of the market by 2%, rising from 985 units, or 17% of the market in 1976, to 1,299 units or 19% of the market in 1977.

Honeywell, Ltd., however, lost market share, dipping from 532 units or 8.9% of the market in 1976 to 526 units or 7.7% of the market in 1977.

Univac Computer Systems and NCR Canada, Ltd. rounded out the slate of the first five finishers.

The Cips census did not include systems that rent for less than $1,000/mo because data collection in that category has become virtually impossible as a result of the recent proliferation of minicomputers.

DEC Building Boston Plant

MAYNARD, Mass. – Digital Equipment Corp. has broken ground for a manufacturing plant to be located on a six-acre site just south of downtown Boston. Completion of the 62,000-sq-ft facility is expected by next July 1.

The company said it will employ a start-up work force of about 40 employees who will be transferred to the Boston plant from other DEC plant locations.

The company said it decided to locate the plant in the downtown area to provide easier access to good jobs for people who need them. It is expected that most of the work force, which could reach 300 to 400 within two to five years, will be made up of Boston residents.

The number of new employees is expected to reach 150 by the end of DEC's first full year of operation in Boston.

The plant will manufacture computer subassemblies such as peripherals, terminals and options, the firm said.

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For Defense Forces

Racal Wins Australian Contract

LONDON — The largest defense communications contract ever placed by the Australian government has been awarded to the Racal Electronics Group. A portion of the $17.25 million contract will be filled by Racal-Milgo, Inc. of Miami, Fla.

The contract is for the supply of sophisticated transportable high-frequency radio communications stations and related items of equipment for use by the Australian defense forces.

The standard communications transmitters, receivers and modems which form a significant part of the contract will be manufactured and produced by Racal in Britain and in the U.S. by Racal-Milgo, Inc.

The Australian Minister for Defense, D.J. Killen, said the equipment would provide much-needed communications facilities for the Army, Air Force and a Joint Force on Deployment.

Killen said Racal was selected after evaluation of proposals from four firms.

According to Ernest T. Harrison, Racal's chairman and managing director, "The contract is an important breakthrough for Racal in Australia and was achieved against fierce international competition. Close technical cooperation between Racal companies based in Britain and Australia has enabled us to produce the high-technology equipment required under the terms of this major defense communications contract.

"We believe another significant factor in this success was our decision to maintain a continuing presence in Australia over a long period of years when very few defense contracts were being awarded by the Australian government."

The order was placed with Racal Electronics Pty. Ltd., based in New South Wales, Australia.

Contracts

Other Contracts

Honeywell, Inc.'s West German subsidiary has received a $26.7 million contract for high-performance infrared aircraft scanning systems for the West German Air Force.

The Pertec Division of Pertec Computer Corp. has been awarded a $2 million contract by Burroughs Corp. Under the three-year contract, Pertec T800 tape transports will be used in the Burroughs B800 small business system.

Computer Sciences Corp. has been selected to negotiate a contract to provide a nationwide computer information system for the Saudi Arabian Ministry of the Interior. The company's proposal has an expected contract value of more than $225 million over a five-year period, suject to final negotiation of contract terms.

E-Systems, Inc. has received a contract valued at about $350,000 from the Ottawa (Canada) Police Force for a digital radio system and 50 in-vehicle terminals.

Applied Devices Corp. and its subsidiary, Datatrol, Inc. has been awarded an initial $11 million contract for the design, installation and management of an on-line Lotto Game by the Canadian province of Ontario.

Data Electronics, Inc. has been awarded a contract to supply digital cartridge tape drives for use in a portable printed circuit board tester from Omnicomp, Inc. of Phoenix.

Norden Systems has negotiated a contract with the U.S. Navy to supply the first updated radar system for the EA-6B Prowler aircraft. The contract is valued at $4.8 million.

Infotron, Inc. has signed a contract with Western Union Data Systems Co. valued at a potential of $4 million over three years. Infotron will supply western Union Data Systems with CRT terminals for use in message and data communications systems.

Supershorts

Depositors Trust Co. has become the first bank in the Northeast to offer retail merchants the point-of-sale (POS) services of EFT Data Services, Inc. These services include check verification/guarantee and credit card authorization through the use of polled point-of-sale terminals resembling desktop calculators.

— — —

Datacrown Ltd. of Toronto has announced a five-year agreement with Hiram Walker & Sons Ltd., Walkerville, Ontario. The agreement provides for expanded services such as additional interactive program development applications and advanced computing facilities for Hiram Walker subsidiaries throughout North America.

— — —

Anacomp, Inc. has signed a letter of intent to acquire Compumatics, Inc. of Fort Wayne, Ind. Compumatics provides on-line services to wholesale distributors in Indiana, Ohio, Pennsylvania, Wisconsin, Colorado and Florida.

— — —

Infoton, Inc. and CII Honeywell Bull have signed a contract extension running to March 1980. Under the terms of the agreement, Infoton will supply CII Honeywell Bull with a version of its microprocessor-based I-400 CRT terminal for use on the latter's Model 62 and 61 computers. First deliveries are slated to begin this month, with volume shipments expected in early fall.

— — —

Memorex Corp. has opened its new 44,000 sq-ft manufacturing plant in Eau Claire, Wis., which will enable the company to increase its production of high-density, multilayer printed circuit boards and associated components.

— — —

First Computer Corp. has recently completed its second expansion in two years with a move to larger quarters at Westmont, Ill.

— — —

New England-based manufacturing operations of Harris Corp.'s Data Communications Division have moved to a three-building, $1.8 million complex in Nashua, N.H.

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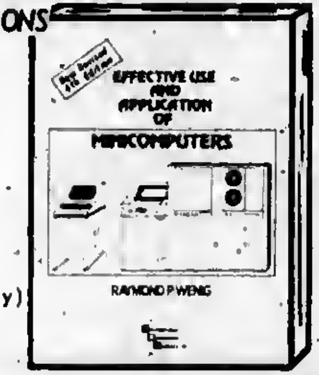

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Infoton Posts 176% Rise In Income Over 1977 Level

BURLINGTON, Mass. — Infoton, Inc. posted a 176% increase in income and a 24% increase in revenues over its 1977 fiscal year results.

Net income for fiscal 1978, ended June 30, was $569,702, or 16 cents per share, up from $206,309, or 6 cents per share, reported for the previous year.

Financial News

However, 1977 results included a loss of $327,046 for discontinued operations, which was reduced to $35,000 this year. Income from continuing operations, prior to deductions for losses and extraordinary credits, showed a 38% rise over the previous year's results.

Revenue for 1978 topped $9.3 million, up from $7.5 million for fiscal 1977.

Fourth-quarter revenue passed $2.5 million, up 7% from fourth-quarter 1977 results of $2.3 million.

Income for the fourth period was $151,481 or 4 cents per share, down from fourth-quarter income of $222,666 or 6 cents per share, in the corresponding period a year ago.

However, no extraordinary credit was taken in 1978's fourth quarter, whereas a credit of $94,000 was taken in the 1977 fourth quarter.

Commenting on the threefold increase in the price of the company's stock since April, President William G. Moore said, "I think we are benefiting from a general renewal of investor interest in potentially undervalued computer stocks. Infoton has been getting better visibility lately. A major contract award from Western Union during the summer seemed to spur investor inquiries."

The company has just introduced a smart terminal, the I-100, which will be demonstrated for the first time at Info '78 to be held in Chicago Oct. 16-19. First deliveries are slated for November, the company said.

Timeplex Sales Increase by 44%

HACKENSACK, N.J. — Timeplex, Inc. reported fiscal 1978 revenues totaling $11.5 million, 44% more than fiscal 1977 revenues of $8 million. Net income for the year ended June 30 was $545,000, or 33 cents per share, compared with income of $309,000, or 20 cents per share, for the previous year.

Fourth-quarter earnings were $134,000, or 8 cents per share, compared with earnings of $75,000, or 5 cents per share, reported in the corresponding period a year ago.

Board Chairman Edward Botwinick said earnings for the first half of 1979 are expected to exceed those for the record first half of fiscal 1978, although revenues for the period are unlikely to match year-ago revenues, which reflected a very large, nonrecurring order.

At year's end, Timeplex said it had repaid all of its bank debt, which totalled $1.1 million at the start of fiscal 1978.

Israel Offering Cash Grants To Some Firms

JERUSALEM, Israel — Companies with "approved enterprise" status are now eligible for additional administered lump-sum cash grants as a result of an amendment to the Law for the Encouragement of Capital Investments enacted recently by the Knesset. These grants, in most cases, equal about 5% of a company's fixed assets.

Another provision of the amendment allows foreign investors in some instances to use tax-exempt Israel pound profits for capital revaluation to offset devaluation losses.

The new industrial venture accorded approved enterprise status by the government can also receive up to 35% of its fixed investment in cash grants and another 40% of its fixed assets in low-cost, long-term loans. Other sources of financing are available, according to *Innovation*, an Israeli industrial publication, to provide operating capital for export purposes or to cover part of research and development costs.

The benefits of this law are credited with having attracted many U.S. and European firms to establish businesses in Israel. Other inducements, according to Innovation, are the availability of skilled labor, scientific and managerial staff and access to the European Economic Community.

Many high technology firms' including National Semiconductor Corp., have recently embarked on new ventures in Israel, the publication said.

Nickels & Dimes

Electronic Arrays, Inc. has agreed to be acquired by a U.S. subsidiary of Nippon Electric Co., Ltd. Under the merger agreement, shareholders of Electronic Arrays will receive $5 per share and will vote on the merger late this month.

$ $ $

Microdata Corp. has signed a new credit agreement for $15 million with the First National Bank of Chicago as the agent bank and with the United California Bank also participating.

$ $ $

National CSS, Inc. will use the proceeds from the sale of its 6-3/8% convertible subordinated debentures to pay the cash portion of the purchase price of Zytron Corp., with the balance to be added to working capital.

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Computervision Corp. has announced to the Securities and Exchange Commission that it intends to file a registration statement offering approximately 400,000 shares of its common stock. The offering will be finalized in November or December.

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Ontel Corp. has arranged a $4 million, three-year revolving credit agreement with the First National Bank of Boston.

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Executive Corner

- Howard A. Thrailkill has been promoted to vice-president and general manager of Harris Corp.'s Composition Systems Division, Melbourne, Fla.

- Arthur J. Stanziano has been named vice-president of the International Division for Hazeltine Corp., succeeding James W. Evans, who has been appointed vice-president of marketing. Dennis M. Hoffman has joined the company as Southern regional sales manager of its computer terminal equipment product line.

- Y.E. "Ed" Juge has joined Radio Shack in the newly created position of computer products manager.

- Edward W. Dolinar has been promoted to the position of divisional vice-president for the northeast region for Data 100 Corp. The firm has also named David H. LaVine to the new post of division vice-president for the company's Iomec division.

- William Cassell has been appointed manager of national systems support at Sycor, Inc.

- Jagdish C. Chopra has become director of marketing research at TRW's LSI Products Division.

- Jack A. Bertch has been named vice-president of sales for Microdata Corp.

- H. William Swanson has been promoted to vice-president of software operations at Datapoint Corp.

- James J. Forese has been appointed assistant treasurer of IBM. J. Richard Young has succeeded him as president of the Office Products Division.

- H. Richard Cossaboon has been appointed director of marketing at Inforex Corp.

- Rand V. Araskog has been elected to the position of senior executive vice-president and chief operating officer at International Telephone and Telegraph Corp. (ITT) Araskog was also named to the executive committee of the ITT board of directors.

- David E. Schnebele has been appointed national accounts manager for Boeing Computer Services Co.

- Sal Castorina has been promoted to vice-president, manager of Michigan operations, for Financial Industry Systems.

- Ralph Hoibakk and Ole C. Schoel have been named members of the board of directors of Tandberg Data, Inc.

- Frank P. Casdia has been appointed national sales manager for Rotron, Inc.

- H.E.J. "Jime" Finke has been appointed vice-president and general manager of Data General Europe. He succeeds Barry J. Fidelman, who has become vice-president of marketing, Americas/Far East. Steve Gaal has been appointed director of systems engineering at Data General Corp., and John E.M. Gardner has been appointed controller for European operations.

- David G. Hensel has been appointed manager of communications product marketing at Decision Data Corp.

- Harry P. Rekas has been named assistant treasurer for Computer Sciences Corp.

- Dennis O'Donnell has been appointed director of national sales for Applied Digital Data Systems, Inc. Harold O. Jones has been named director of engineering services at the firm, while Alan G. Stromberg has assumed the newly created position of manager of intelligent terminals. In addition, Irwin Podbielak has been appointed director of quality assurance by the company.

- J. Ralph Leatherman has been elected chairman of the National Computer Conference Board.

- Norman C. Walker has been appointed president by the board of directors of Pfystar. His first official act was to institute a change in the corporate name to Pentron, Inc.

- Bill Crisp has been named administrative manager and W. Michael Langhart director of product development at Chase Computer Corp.

- John G. Kemeny, president of Dartmouth college, has been elected to the board of directors of Honeywell, Inc.

- Jon E. Reynolds has been appointed senior operations officer of Solar Services, Inc.

- Ray E. Miller has been named group director of General systems and memory systems at National Semiconductor Corp.

- Tom Edwards has been named marketing manager for Epic Data Sales Ltd. as well as the company's U.S. subsidiary, Epic Data Corp.

- Don Moore has been appointed manager of marketing services at the Pulsecom Division of Harvey Hubbell, Inc.

- Dick Milligan has been promoted to vice-president of customer service at System Industries.

- John T. Corser has been named manager of marketing communications for Qume Corp.

- M. Dee Bantillo has been made customer service supervisor at the Electron Division of NEC America, Inc.

- Brian E. Elliott has been appointed to the new position of product marketing manager for discrete semiconductor products at the Electron Devices Division of NEC America. Michael C. MacKanin has assumed the position of customer services department manager.

- Ted N. Brandon has been appointed vice-president of administrative services at Fisher-Stevens, Inc.

- William F. Jordan Jr. has joined Boschert, Inc. as vice-president of engineering.

- Peter S. Anderson has been elected vice-president of marketing development at Mohawk Data Sciences Corp.

- Samuel Ochlis has been appointed president of CSP, Inc.

- David C. Penning has joined the staff of Gnostic Concepts, Inc. as vice-president and director of the Computer Division.

- Jeremy L. Ipsen has been named vice-president of the computer group at Fabri-Tek, Inc. Richard A. Eichstaedt has been appointed vice-president of the firm's component group.

- Ian Caldow has been named vice-president of operations for Cipher Data Products, Inc.

New Companies

Active Learning Systems has been formed to develop computer-based education systems. The company is located at Suite 106, 601 Broadway, Denver Colo. 80203.

Mauro Associates, Inc. has been formed to provide human factors engineering and industrial design services to DP manufacturers and end users. The firm is located at 135 W. 41st St., New York, N.Y. 10036.

Records Technology Corp. has been formed to provide management planning, microfilm services, filing equipment, inactive archival storage and other services to solve record management problems. The company is affiliated with Iron Mountain Security Storage Corp. and is located at Suite 1143, 141 Milk St., Boston, Mass., 02109.

EICO Data Products has been formed to specialize in the marketing and distribution of terminals. It is a division of EICO Electronic Instrument Co., Inc. The company is located at 108 New South Road, Hicksville, N.Y. 11801.

Develcon Electronics., Ltd., a manufacturer of limited distance data sets, has expanded its marketing effort into the U.S. with the formation of Develcon Electronics Inc. The company is located at 423 N. Main. St., Doylestown, Pa. 18901.

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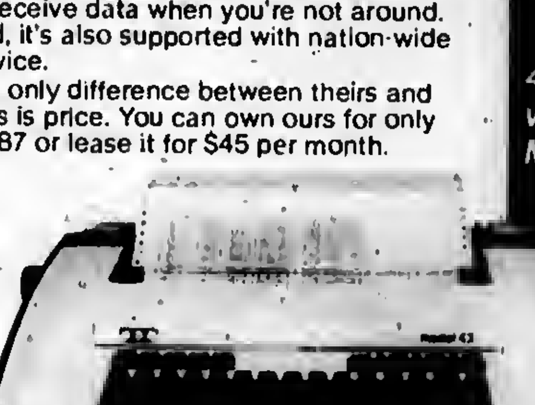

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LANGUAGES QA

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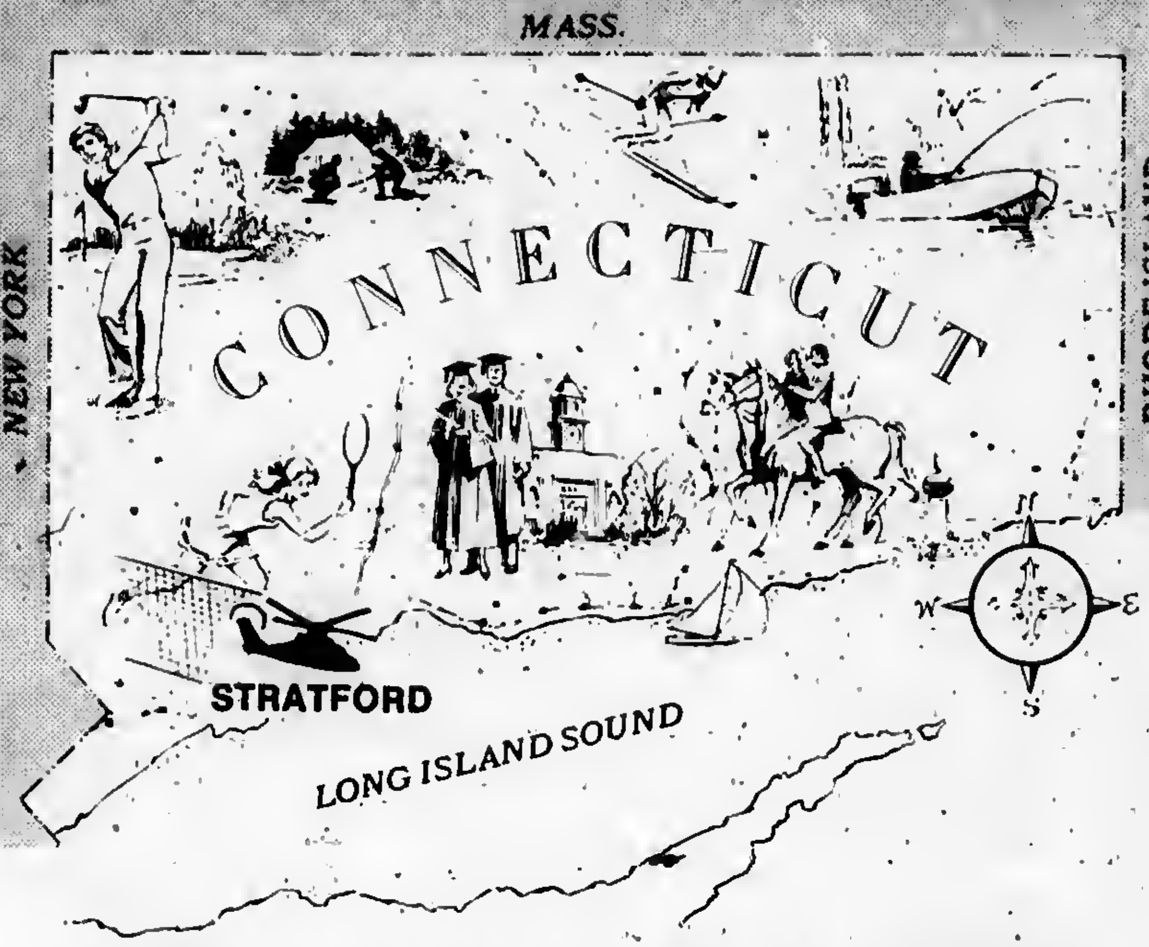

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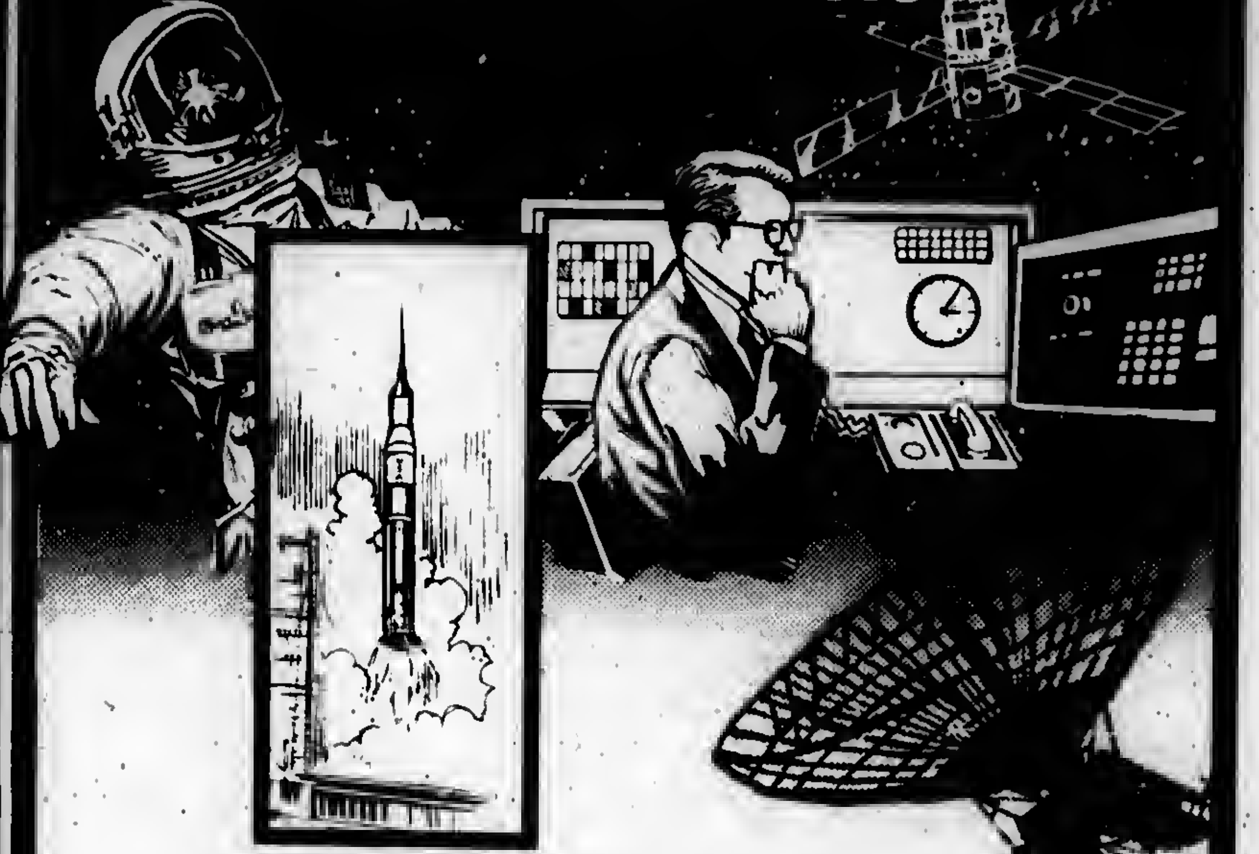

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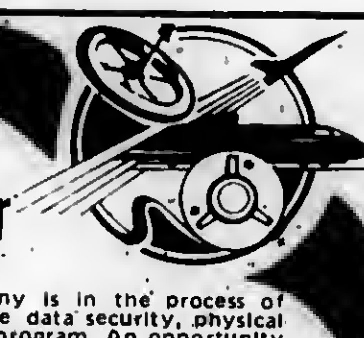

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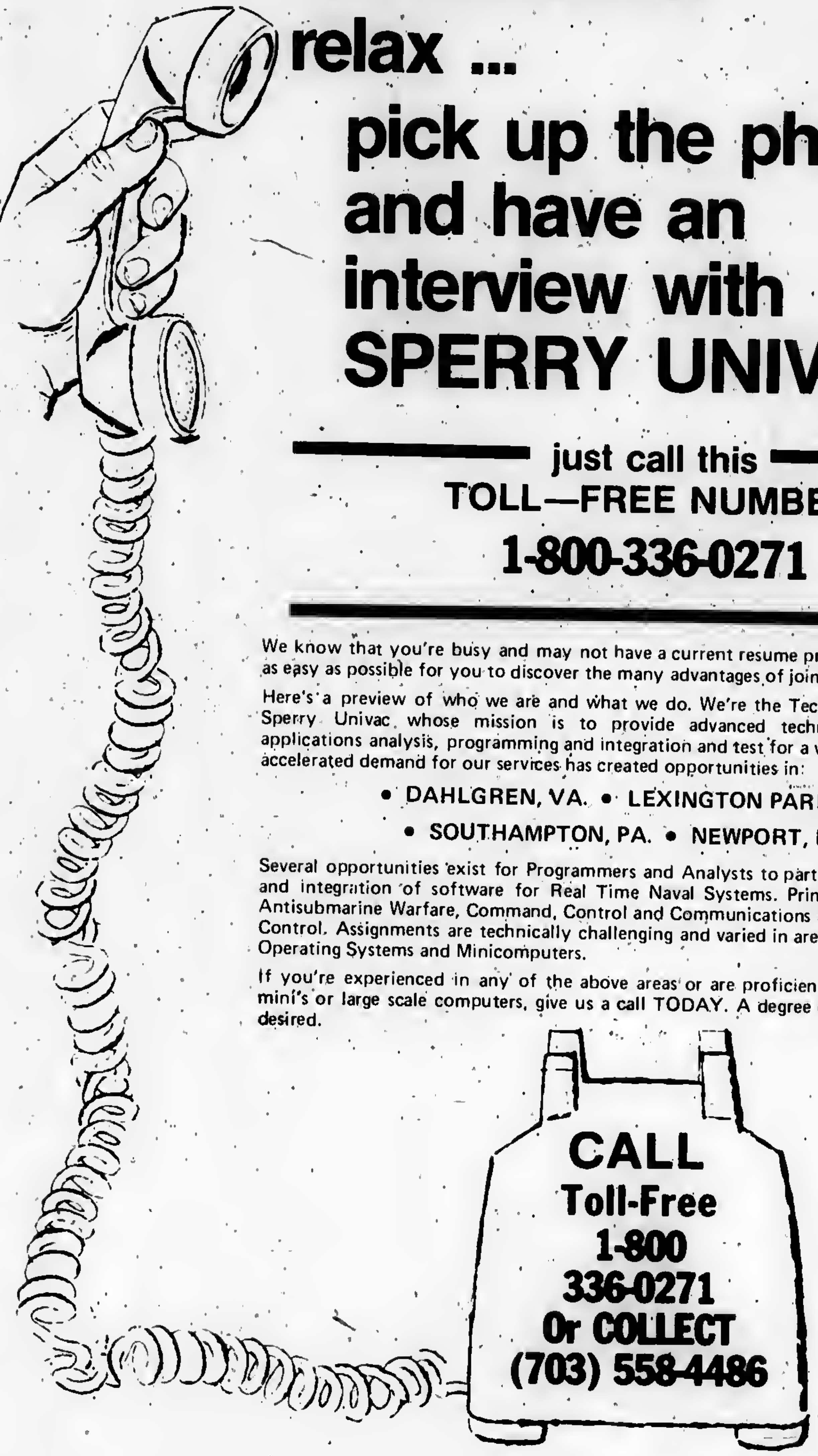

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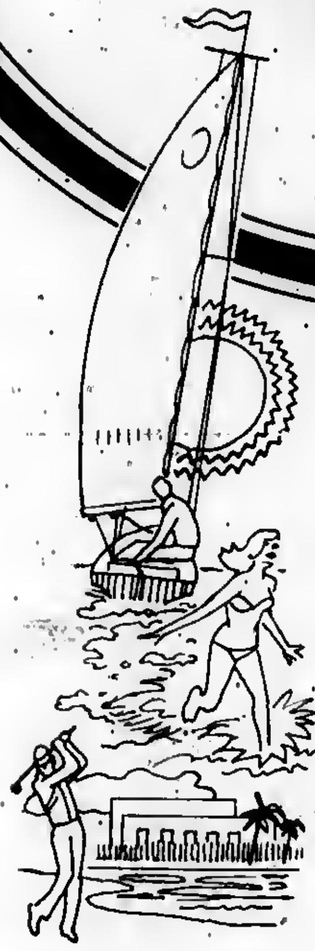

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Mr. T. L. Haworth
Personnel Services — FREH
Purdue University
West Lafayette, Indiana 47907
(317) 749-6256

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Computerword

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COMPUTERWORLD

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San Francisco Peninsula

Assume the responsibilities of auditing Syntex Computer Facilities worldwide! Your basic auditing will involve systems for the IBM 370/158 located in Palo Alto, CA., but your scope will extend to minicomputer applications at other Syntex locations. You will audit both existing and new applications systems as well as assuming responsibility for continued development of corporate EDP audit programs.

This key position requires a BS/Data Processing or Accounting (MBA preferred) and 3-5 years experience in EDP audit, application system development and systems analyst programming. Knowledge of COBOL and/or PL/1, strong analytical skills, ability to interact effectively with operating management and good writing skills essential.

SYNTEX is a unique, Multinational Corporation offering career advancement opportunities and most attractive compensation & benefits package. Relocation assistance. Please send resume, including salary history, in confidence, to A. Hall (Please refer to Ad #7586). SYNTEX, 3401 Hillview Avenue, Palo Alto, CA 94304. We are an equal opportunity employer.

SYNTEX

Communications Programmer/ Analysts

...for all-new digital network group

There are exceptional career-growth opportunities for software professionals to work on the design and implementation of a state-of-the-art minicomputer-based packet and message switch. The candidates we seek should have at least 2 years experience in programming at the Assembly language level. They should be familiar with the usage of vendor operating systems and have hands-on experience with minicomputer program debugging. Experience in any of the following would be a plus:

- Design of file structures, data base building and maintenance.
- Programming and debugging of software handlers and drivers for peripheral devices (disk, tape, etc. with DMA interface).
- Communications, especially with a packet network or message switch.
- Standard techniques of queueing within real time minicomputer operating systems.
- Coding of support utilities or debugging aids.
- MACRO assembler code generation/optimization in a minicomputer environment.

An academic background with a degree in Computer Science /Engineering helpful.

We are looking for an exceptional talent. You can expect an exceptionally challenging work environment and continually interesting assignments. You will work with a highly qualified professional team active in the development and application of advanced software technology for computer networks.

Send your resume, including salary requirements, in confidence to: Charles Doughty, Employment Office

ITT DOMESTIC
TRANSMISSION SYSTEMS, INC. ITT

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Programmers

COBOL/FORTRAN

BECHTEL POWER CORPORATION is a world leader in nuclear and fossil power plant engineering and construction. Our Gaithersburg, Maryland facility is conveniently located 15 miles northwest of Washington, D.C. We have several challenging and rewarding long range career opportunities in the following area:

Application Programmers

All positions require the ability to interface on a variety of business and engineering applications including program design, program support and documentation. Must have two or more years' programming experience. Prior Univac 1100 series experience desirable.

For immediate consideration, please send resume in confidence to: Lyle Padgett, Bechtel
Employment Dept. 2-75-8
15740 Shady Grove Road
Gaithersburg, MD 20760

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BECHTEL

PROGRAMMER ANALYSTS

The Southwest Florida Water Management District, located in the central Florida community of Brooksville, is currently seeking individuals for their scientific programming area. Duties will include the creation and maintenance of an on-line MIS system in a technical environment. Knowledge of FORTRAN and COBOL a must. Experience with UNIVAC 90/30, OS-3 and IMS-90 a definite plus. Entry level as well as senior grade positions available. Please submit resumes along with salary requirements to the Southwest Florida Water Management District, 5060 U.S. Highway 41 South, Brooksville, FL 33512. EOE M/F.

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NEW HAMPSHIRE

Are you tired of high taxes and expressway jams? Then you should consider the numerous critical positions that we have in N.H. for Applications Programmers, Programmer Analysts, Systems Analysts, and EOP Managers, all with either insurance or manufacturing applications experience. All positions with dynamic growth oriented firms. Salaries from low teens to thirties. Contact David J. Osgood, CEC, Vice President.

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603/669-4440

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Manager, Project Leader

Medical Institute is seeking a Manager with Systems Planning/User Documentation. Systems 3 RPG II experience is required. They have a Systems 34 on-line. Liaison for hospital users, programming dept. and IBM techs. Mid 20's + Excellent Benefits.

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Complete management responsibility for the Administrative Systems Office. Plan and develop all systems, including financial, student and personnel information. Requires a BS/BA and 5 to 7 years systems experience and computer knowledge. Salary Mid-20's. Send resume, including salary history, by October 20, 1978, to: T.J. Verbonitz, Director of Administrative Services, Bldg. 36.

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LARGE, MODERN, TECHNICALLY SOPHISTICATED CLIENTS located in the SUNSHINE STATE have requirements for PROGRAMMER ANALYSTS and SYSTEM ANALYSTS in the area of DATA BASE/DATA COMMUNICATIONS. EXPERIENCE with IBM 370, CICS, IMS, SOLC, SNA, NETWORKING, COBOL, ASSEMBLY LANGUAGE and a COLLEGE DEGREE is desirable. Please submit RESUME including SALARY HISTORY or CALL

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1211 N. Westshore Blvd.
Tampa, FL 33607
(813) 872-1853

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Large Manufacturing Company located in the midwest is seeking a person experienced in IBM and IMS-OB/OC systems. Excellent benefits. Send detailed resume including approximate salary requirement to C.W. Ramsey, Manager - Industrial Relations,

WABCO
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PROGRAMMERS

Bored with Insurance Banking Applications?

Due to promotional advancement and expansion, St. Joseph Hospital, a leader in Health Care software development, is currently seeking career oriented high caliber Data Processing Personnel to work on development of "ON-LINE" applications. Current environment is DOS/VS on a 370/138; (VM will be implemented in early 1979 on a 3031). SPM is utilized for program maintenance and development.

SENIOR PROGRAMMER

Two years' minimum experience COBOL in a 360/370 environment. Experience with CICS or Data Base a plus. Will train qualified individuals in CICS.

SYSTEMS PROGRAMMER

Experienced with installation and maintenance of CICS/VS. Knowledge of BAL or Data Base a plus.

Positions compensated with excellent salary and comprehensive benefit package complemented by a pleasant working environment.

Please submit resume and salary requirements to:

PERSONNEL ASSISTANT

ST. JOSEPH HOSPITAL

200 High Service Avenue
North Providence, RI 02904
An equal opportunity employer

Timeplex, the world leader in data communication TDM products, is expanding its Marketing and Engineering Development divisions. Opportunities are now available in the following areas:

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This is a high visibility Marketing position requiring interfacing with customers, the sales force and engineering. Responsibilities include setting of functional specifications, market research, sales forecast, proposal overview and product monitoring. Degree in Computer Science or E.E. and minimum 2 years experience desired.

SYSTEM PROGRAMMERS & DESIGN ENGINEERS

Knowledge of microprocessor (M6800, Z80, TI9900) software and/or hardware is required for these challenging positions. You will have key responsibility in the structuring of products at the forefront of technology that will be used in national and international networks. Degree in Computer Science or E.E. and minimum 2 years experience desired.

In addition to competitive salaries and excellent benefits: TIMEPLEX offers a stimulating working environment and substantial opportunities for advancement. Send resume, including salary history to the attention of:

S.P. HARITON

TIMEPLEX, INC.

100 Commerce Way, Hackensack, N.J. 07601

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DATA PROCESSING PROFESSIONALS

Career opportunities now available with a progressive Data Processing Organization in one of the fastest growing financial institutions in the Southeast. Current environment includes Twin IBM 370/158's OS/VS1, batch and on-line applications. We have immediate openings for the following:

PROGRAMMER/ANALYST

Requires 2 to 5 years experience, ANSI COBOL, OS/JCL and OS utilities. BAL knowledge helpful.

ON-LINE PROGRAMMERS

Minimum 2 years experience on CICS/VS, VTAM, NCP. Understanding of SNA helpful.

PLANNING ANALYST

Requires 2 to 5 years experience in tactical and strategical planning and feasibility studies. Knowledge of programming beneficial.

All positions relate to banking application. Degree in computer science, math or statistics preferred. Salary commensurate with background & experience. Excellent benefit package. Send resume and salary requirements to Ms. Deborah Kellermann, P.O. Box 012111, Miami, Fla. 33136.

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DATA GENERAL—Nova ALP Fortran macro new application developmt $26-28K
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SOFTWARE Sysgens exp nac $27K
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DEC 10 COBOL Fortran PL1 T/S $25-27K
OS 1100 exec internals $23-29K
PUBLIC Financa computar analyst. MBA desirad. Fortran timesharing. $25-31K
PL1 Fortran corporate finance anal. $27-31K
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PROG ANAL NJ loc COBOL DOS VS $23K
FORTRAN Timesharing-deg cnsltng. $19-26K
PRIME T/S spec COBOL $22K+
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Opportunity to join newly organized date processing dept. Grdund floor opportunity. Positions include project management, systems anelysis, Sr. Programmer enalyst & programmar levels migrating upgrading from DOS to OS environmant. No prior Wall St axp is necessary, although helpful. No prior OS necessary. Applications areas include all areas of financial and operational areas. Firm inventory trading etc. Selaries $21,000 to $33,000 plus bonus.

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N.Y. 10038

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Analysis & Apolication Programming on Hewlett Packard Mini Comouters HP21MX and HP-3000 using Fortran and Cobol.

Excellent Salary and Company Paid Benefits.

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CSC

Ask Lynn Hopewell about Computer Systems Architecture at CSC.

You're likely to hear answers like these:

“This part of CSC is a systems engineering organization. We do everything from the time an idea is a gleam in a client's eye, to the time it is something he can turn on and use. We used to be known strictly as a services organization, but we're changing rapidly into a group that provides services AND turnkey products — primarily in the computer and communications field.

“Of course we don't manufacture computers or communications hardware, so when I say a complete product, I mean engineering and software combined with off-the-shelf computers, turned into a usable product . . . with the understanding that we buy the computers and anything else necessary to turn over to the client a complete operating entity.

“My operation is targeted towards computer networks . . . those systems having a tight coupling between communications and computing. This is a very large and growing segment of the computer industry.

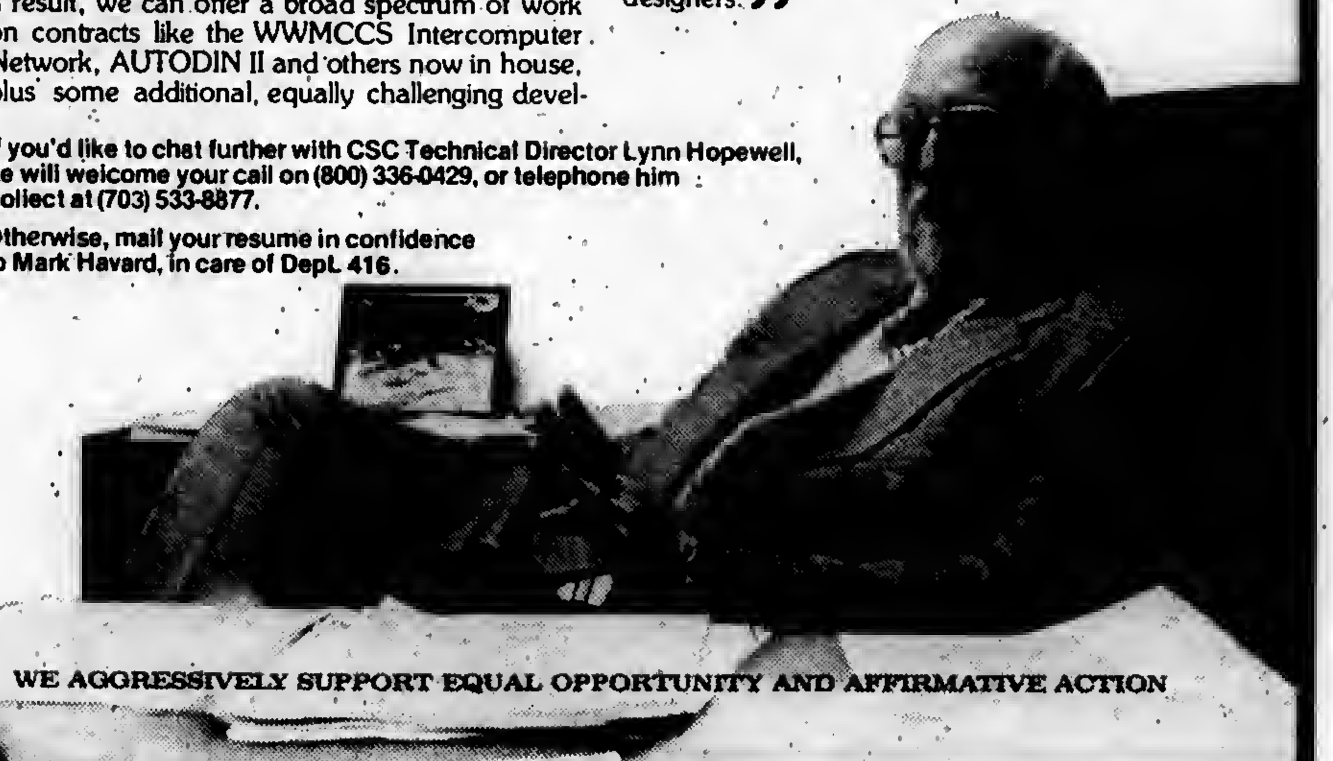
“We're fortunate to have some very well recognized expertise in networking in the resource sharing and packet switching world. As a result, we can offer a broad spectrum of work on contracts like the WWMCCS Intercomputer Network, AUTODIN II and others now in house, plus some additional, equally challenging development opportunities in progress.

“We can offer very meaningful posts to PhD's in Computer Science and Electrical Engineering for advanced network development situations solving rigorous theoretical and practical architecture issues. We also need junior software people and electrical engineers with good academic backgrounds who can grow into full fledged senior members of the staff. Our junior people are working themselves up the ladder so rapidly, we are constantly looking for more.

“Mixed degrees are a special asset here . . .mixed BS, MS, and PhD's in EE and Computer Sciences. Another important need—people who know minicomputers — who are essentially hardware/software systems architects in mini's, but within the communications environment. They should be able to provide optimum hardware/software architectural solutions to complicated requirements. We also need message switching architects, computer benchmark experts, digital circuit designers, computer network performance modelers, and distributed data base/software designers.”

If you'd like to chat further with CSC Technical Director Lynn Hopewell, he will welcome your call on (800) 336-0429, or telephone him collect at (703) 533-8877.

Otherwise, mail your resume in confidence to Mark Havard, in care of Dept. 416.



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applications programmer analyst

New York City

Interbank is the leader in tha expanding EFT and bank card industry. Our two internetional banking networks (real-time end batch) use distributed processors, mini's, micro's and central duplexed IBM computer sites. Wa offar en opportunity to work in a challenging advanced application environment with a futura in a small group with congenial talantad co-workers.

Excallent selary, benefits and opportunity for advancemant in our expanding data processing division. Work involves both solo projects and project leader control of software contractors. 20% domestic travel.

Requires minimum of two years analyst programmer experience, with one year of assembler or PL-1 (COBOL acceptable) and one yaar of systems design. Desirabla to have third year of experience or computer science degree or MBA. Banking or bank card experience helpful.

Send resume with salary requirements
and history to Personnal Manager

master charge
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WEST COAST FLORIDA

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IBM 370/155 and 370/145 installation utilizing DOS/VS and CICS. Program development in an online environment. Immediate ooening $13,166.40 to start.

Send resume c/o Unified Personnel System, 315 Haven Street, Clearwater, Florida, 33516, Pinellas County Government, E.O.E., or call Mr. Ronald C. Bennett, Personnel Department, (813) 448-2367.

PROGRAMMER ANALYSTS

Excellent salary, liberal fringe benefits, in a country setting in central N.J., 370/148, DOS/VS/CICS. Minimum of 3 years COBOL experiance is required.

Send resume and salary requirements to:

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Texas Federal Savings

SENIOR SYSTEMS ANALYST/PROGRAMMER

- 5 yeers experiance required in IBM 360;370 (ALC).
- The candidate will have the ability to advise and consult on tha implementation of systems/oroaremmina aoolications, devises date verification methods, code, debug and document programs.
- Expertise in all phases of systems analysis/programming work is a must.
- Savings and Loan or ralated financial experience preferred.

Please send resume to address below or contact the Human Resource Department for further information.

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AND LOAN ASSOCIATION

P.O. Box 12666
8300 Preston Rd.
Dallas, TX 75225
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To develop new applications for our $2.5 billion bank holding company.

As a member of our project teams you will be combining your talents with those of other D.P. Professionals in developing new on-line systems for our varied users including the Bank's International and Money Management Departments and our correspondents, using PDP 11/70 equipment and BASIC programming language.

In our retail banking system we are developing EFTS for our 47 branches using IBM software, 370/145 DOS/VS, as well as telecommunications equipment.

These developments offer challenging opportunities for programmers, systems programmers and systems analysts to work in a career oriented, team environment where individual achievements are recognized and rewarded.

If you feel your skills and philosophy integrates with ours, we encourage you to send your resume in confidence to:

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Personnel Department

INCORP

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HUGHES

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Tasks to be performed include:

- Integrating state-of-the-art statistical and scientific software into our corporate data processing network.
- Aid in consulting and training of our Hughes professional staff.
- Develop forecast models predicting future loading on our computer network.

This is a senior position requiring analysis, programming, leadership and a thorough knowledge of timesharing systems and FORTRAN.

Good communication skills and MS, PhD, or equivalent, in Computer Science or appropriate scientific field are MANDATORY.

SCIENTIFIC COMPUTING CONSULTANT

Tasks to be performed include:

- Providing programming and debugging assistance to scientific computer users, conducting seminars and short courses in FORTRAN, TSO, JCL, and other programming subjects.
- Writing user documentation, participating in software product evaluation, and software quality assurance.

A Bachelor's degree in mathematics or related science is mandatory. The qualified applicant should have experience in FORTRAN PL/I, TSO, and OS or VS JCL.

If you can meet our needs and are interested in discussing your role at Hughes and how we can meet your needs, please send your resume to: Hughes - C&DP Employment - 63LA CLN, Ground Systems Group, 1901 West Malvern, Fullerton, CA 92634.

HUGHES

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Equal opportunity M/F/HC employer

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To develop an integrated data base for the University — 12 new analyst positions have been created.

- 6-Analyst I - Interested in data processing - a beginning position (college degree or equivalent experience).
- 4-Analyst II - requires a minimum of 2-1/2 years of (COBOL) experience and college degree or equivalent additional experience
- 2-Analyst III - two years of Analyst II type experience.

Send resume to:
Dr. John M. Tylar
System Network Computer Center
Louisiana State University
Beton Route, Louisiana 70809

AA/EOE

PROGRAMMER/ANALYST

To develop administrative systems, and provide technical assistance to students/faculty in statistical software uses and inter-active instruction and research applications.

The ideal applicant will have three or more years of programming experience, and will be competent in COBOL and FORTRAN or BASIC, and have data base design exposure in an on-line environment. Background in higher education preferred.

Salary is about $17,000, depending on experience and abilities. Four weeks vacation yearly. Liberal benefits.

Send letter, application and resume to: Mr. C.R. Weber, Personnel Director, State University College, Oneonta, N.Y., 13820. Closing date for application is November 1, 1978. SUNY is an Equal Opportunity Affirmative Action Employer.

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Our prestige mfg client seeks an individual to direct the complete data processing and administrative resources of their organization. Position is located at desirable suburban corp hdqtrs site convenient to East Coast metropolitan and resort areas. Client seeks proven capability to motivate and supervise 80-120 personnel, knowledge of the latest data processing technology, as well as large-scale systems development capability. Our client seeks outstanding communications ability to deal effectively with top level corporate management. To discuss this outstanding opportunity contact, in confidence, Steve Burns, 215/561-6300

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Market computer time for an industry leader where the base salary can go to $30,000 and incentive structure will be geared to potential earnings of three times base. You will be calling on high level executives selling the time-sharing services that are not highly technical. If you are successfully selling computer time or any other intangible to top level executives, you will want to investigate this unusual career opportunity.

For further information, please contact Dot Chence at (713) 621-9050

All Fees Assumed by Client Companies

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SYSTEMS ANALYST

To work closely with clients to solve their data processing problems. Work environment is "hands on" with the majority of work being performed on IBM GSD equipment. Knowledge of RPG II and at least one procedural language needed.

Send resume in confidence to:
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For Colorado Springs

Federal Express has opened a Data Center in Coloredo Springs this August. A system is being developed which will operate under the Airline Control Program (ACP) and will service upwards to one thousand on-line terminals.

Federal Express is looking to add several professionals with two to four years experience with Assembler Language. Openings exist in the Applications Development Area, where PARS/ACP experience will be helpful, as well as in the Systems Programming and Support Areas where two years Systems Programming under MVS/VM is a prerequisite for consideration.

Federal Express, America's Airline for Packages, offers excellent compensation, a benefit package which includes interline travel and flight privileges on cargo planes, and advancement opportunity in a growth-oriented, creative environment. To apply send confidential resume, including salary history to:

Federal Express Corporation
Brenda Douglas, Manager of Personnel (CW)
Clerk Towers Location
AMF Box 30167, Memphis, TN 38130
Equal Opportunity Employer M/F

Programmers

Looking for upward mobility as well as challenging work?

Talk to Merrill Lynch

Your future with us is limited only to your abilities and ambitions. That's why if you're a talented programmer, eager to expand your technical know-how and career potential, we'd like to hear from you.

All positions are based at our New York City headquarters - in one of the largest, most advanced computer installations on the East coast. Salaries are excellent. Benefits are outstanding. And you'll have plenty of opportunity to move up fast in your area of interest.

Openings are for:

PROGRAMMERS

You'll join a select communications team in our Corporate Systems Division. Duties will primarily involve sales support, including developing brokerage applications for a totally on-line system. You should have experience with BAL, CICS, DOS/OS and TSO. Knowledge of brokerage functions and data base management would be assets.

SYSTEMS & APPLICATIONS PROGRAMMERS

Requires a background in programming in FORTRAN/Macro Assembler and at least one year of experience working with Data General equipment. Success in these positions could lead to higher level systems programming or applications roles - depending on your goals

We have many more openings for Programmers/Analysts with all levels of experience.

For more information, send for an application to: L.D. Kelly, Employment Dept., Merrill Lynch, 1 Liberty Plaza (165 Broadway), New York, NY 10080.

Merrill Lynch
Pierce Fenner & Smith Inc.

Merrill Lynch is an Equal Employment Opportunity employer and encourages applications from females, minorities and all other persons.

MANAGER SYSTEMS DEVELOPMENT

Univ. of California
Systemwide Admin.

Exciting opportunity for the right Systems Development Manager. We have just established a new Corporate Systems Development organization to plan and implement information systems in a new Distributed Systems environment.

Responsibilities include management of all phases of new information systems development, from proposal to programming, for the University's Systemwide Management Team. Planning and Budgeting for corporate systems staff, hardware, and software will be a major responsibility for this manager.

Benefits are generous, including five weeks annual vacation. Salary range $23,500-$33,100.

We require broad and successful information systems project management experience in a large organization. Ability to communicate well is essential. We prefer an MBA or equivalent plus five-seven years systems development experience. Send resume to: Box 33 University of California Personnel Office, 2539 Channing Way, Berkeley, California 94720. An equal opportunity employer.

If you have questions, please call Mr. Conley (415) 642-6581.

Computer Operator

For Washoe Medical Center in Reno, Nevada. Minimum 1 year experience with disc and tape. Competitive salary, liberal benefit package including State Retirement Plan and excellent, stable working conditions.

Call weekdays (702) 785-4156 or apply Personnel Office, WASHOE MEDICAL CENTER, 77 Pringle Way, Reno, Nevada 89520 An equal opportunity employer.

DATA PROCESSING

SYSTEMS ANALYSTS, PROGRAMMER ANALYSTS SYSTEMS PROGRAMMERS

BURROUGHS WELLCOME CO., a long-established manufacturer of drugs and pharmaceuticals, is seeking highly motivated, career-oriented data processing personnel.

SYSTEMS ANALYSTS

Responsibilities will include evaluation of user requirements for business systems in the areas of manufacturing and finance, development of systems architecture, and detailed systems specifications.

Requirements include a B.S. degree in Statistics, Mathematics, Accounting, Computer Science, or equivalent experience/training as an Analyst. Minimum of four years experience as a Systems Analyst in a Data Base environment for business systems, including COBOL or PL/I, is necessary. IMS exposure a definite plus.

PROGRAMMER ANALYSTS

Responsibilities will include application software development in an IMS Data Base environment, including program coding, test data generation, and implementation responsibilities.

Requirements include a B.S. degree in Computer Science or equivalent experience/training as an analyst, and a minimum of three years data processing experience in all aspects of programming, testing, and debugging programs in PL/I or COBOL. Must be able to prepare documentation for users and have good oral and written communication skills.

SYSTEMS PROGRAMMERS

Responsibilities will include defining and programming moderately complex software such as utility programs, catalogued procedures (job control language), macros and subroutines. Will assist in or be responsible for complex software installations such as system control program generation.

Requirement include a B.S. degree in Computer Science or equivalent experience/training as a Systems Programmer and a minimum of one year experience with OS/VS1 or OS/VS2 software in systems programming or applications maintenance programming. Working knowledge of macro assembler language programming and good oral and written communication skills are also necessary. MVS experience a definite plus.

BURROUGHS WELLCOME CO. facilities are located in the beautiful Research Triangle Park area of North Carolina. The Triangle Park area, surrounded by Durham, Raleigh, and Chapel Hill, provides not only superior living and recreational opportunities, but also moderate winters, pollution and smog-free summers, and a reasonable cost of living.

BURROUGHS WELLCOME CO. offers a comprehensive, company-paid benefit package including family medical insurance, employee life insurance, sick leave, and pension program. In addition, these positions offer excellent growth potential, competitive salaries commensurate with experience/training, and a generous relocation allowance.

Systems Analysts, Programmer Analysts, and Systems Programmers who meet the job requirements and are interested in joining an innovative, dynamic organization should send a resume detailing education, training, work history, D.P. equipment and language experience, and salary requirements to: Employment Supervisor, **BURROUGHS WELLCOME CO.**, 3030 Cornwallis Road, Research Triangle Park, N.C. 27709.

If you do not have an up-to-date resume readily available, call Clyde Rush, COLLECT (919) 549-8371, Ext. 292 to apply.

All Replies Held In Confidence — All Replies Will Be Acknowledged

Wellcome

BURROUGHS WELLCOME CO.

An Equal Opportunity Employer M/F

MINORITY, VETERAN, HANDICAPPED INDIVIDUALS ARE ENCOURAGED TO APPLY

PROGRAMMER ANALYST

Project Leadership Responsibility

UPPER PENINSULA

We are a major independent natural resource mining company with a solid earnings growth record. Our business is iron ore mining and processing operations, Great Lakes Shipping as well as diversification in other natural resource and energy-related areas.

If you are a project-oriented data processing professional with 5 to 7 years in design and programming of business systems in an OS/VS-1, CICS, IBM 370 Series Installation we are interested in talking with you. We believe this challenging opportunity may be especially attractive to a shirt-sleeve professional interested in a professional yet informal work climate. An appropriate college degree is preferred but "hands on" knowhow is the prime requisite. The successful candidate must be available for relocation.

We are offering an excellent salary plus bonus and a comprehensive company paid fringe benefit package. In addition, our Northern Michigan location offers the advantages of a small city environment and outdoor recreational opportunities to suit every interest.

Please call collect or send resume including salary requirements in confidence to: **Employment Supervisor**

The Cleveland-Cliffs Iron Co.
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(216) 241-2356

Equal Opportunity Employer M/F

SENIOR SYSTEMS ANALYST/ PROGRAMMER
$19,730 to $23,988 per yr

ASSOCIATE SYSTEMS ANALYST/ PROGRAMMER
$16,236 to $19,730 per yr

SYSTEMS ANALYST/ PROGRAMMER
$13,356 to $16,236 per yr

IN SAN DIEGO! EXCELLENT BENEFITS

We are seeking several individuals to analyze systems, perform feasibility studies and write computer programs.

Associate level requires experience in systems development/programming using COBOL in an IBM OS/VS environment. Senior level requires same experience as Associate plus project leader experience. Systems level requires college level course work in information systems.

Special application forms are required. Apply immediately to:

San Diego City Schools
4100 Normal Street
San Diego, CA 92103

An Equal Opportunity Employer

ARIZONA FORTUNE 500 COMPANY

Programmer/Analyst

Progressive MIS department is seeking a dynamic individual with three to five years RPG II plus one to two years CCP experience. Manufacturing background preferred.

Exposure to interactive data base techniques a strong plus.

Be a part of this challenging environment that offers excellent advancement opportunities.

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Minimum of two years experience in programming using BAL, ANSI COBOL and/or FORTRAN IV in an IBM 360/370 environment. Bachelors degree in Science, Engineering or Business preferred but not required.

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Minimum of five years data processing experience of which two must have been in systems analysis and design. Bachelors degree in Science, Engineering or Business preferred but not required.

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Qualified candidates who wish to be considered for the above positions should send their resumes, including salary history, in confidence to:

Mr. A. M. Strickland
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P.O. Box 529100
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Seeking an ambitious person with leadership qualities who is able to work independently and communicate effectively with top management.

The successful candidate will design, program and implement new systems along with maintaing existing systems and will be responsible for installing/developing IBM system 34's in a five plant envelope manufacturing division of a Fortune 500) company located in western suburbs of Chicago.

A minimum of 6-7 years systems/programming experience, with RPG and mini-computer knowledge preferred. A degree, preferably in Computer Science is desirable. Written documentation skills a must.

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PROGRAMMERS ANO ANALYSTS with 1-7 yrs Honeywell 6000/L-66 COBOL experience, IOS, OM-4, TP are a definite plus.

PROGRAMMERS/ANALYSTS having hands-on experience with 1401 SPS to work with state-of-the-art translator or group.

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Starting salery for this position is $21,043 to $23,794 depending on qualifications. Please apply to King County Division of Personnel, Rm 214, King County Administration Building, Fifth & James, Seattle, Washington 98104 by October 20, 1978 for consideration.

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The position requires understanding of audit and data processing philosophies and knowledge of hardware, software, teleprocessing as well as experience in application and system programming, DMBS, and systems analysis and design. CDP, CIA, CPA, or MBA helpful. You will use professional oral and written communication skills to:

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- Assist in establishing and implementing controls, audit trails, and audit techniques in EDP applications being developed.
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Manager - Employment

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System Network Computer Ctr.
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Candidate should have a strong academic background and technical expertise gained from 3 to 5 years experience in the area of business systems development. Significant experience with hardware/software evaluation, distributed processing, minicomputers, and/or telecommunications would be beneficial. Above average problem solving ability and excellent communication skills are required. Some travel is required.

Challenging work in a very professional environment make this position attractive. Compensation is commensurate with ability and experience, and includes a bonus and excellent fringe benefits.

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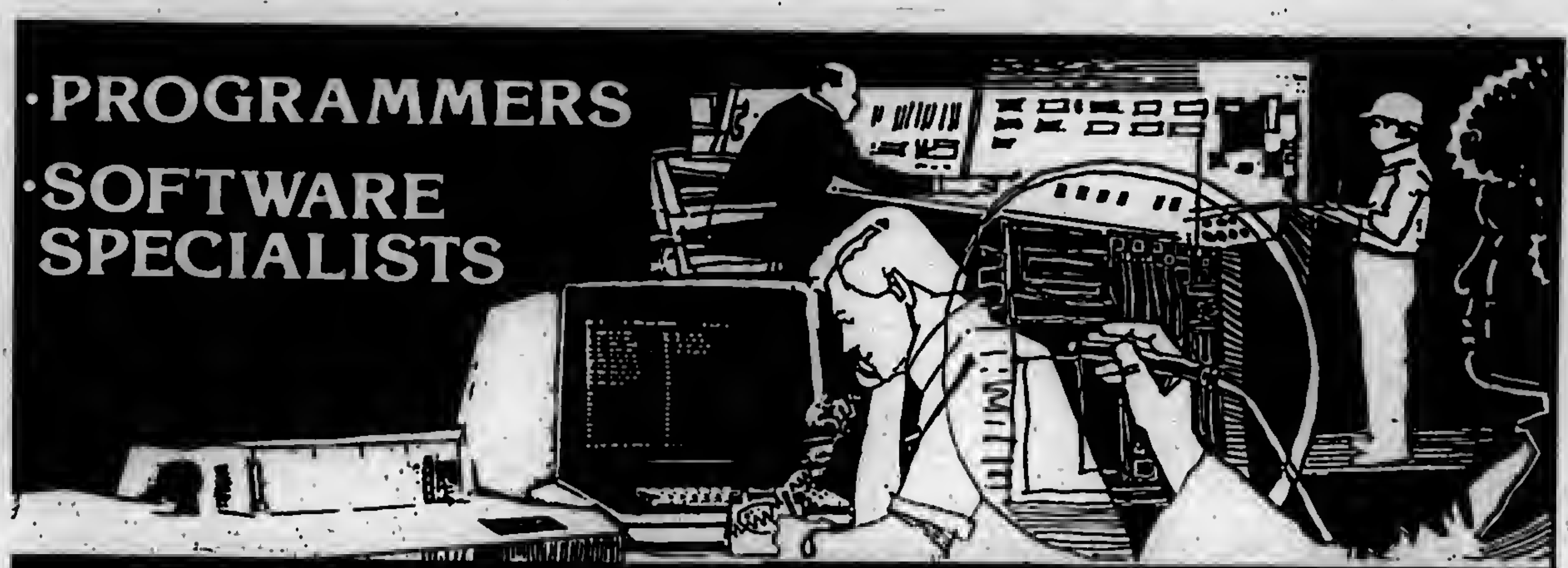
Administrative systems. Design through documentation, planning, supervision and instruction require: 2- or 4-year related degree; 2-4 years' Programmer or Analyst experience, including significant PL/1 applications and IBM 360 or 370 systems; good communication and interpersonal skills. BASIC and OS/360 experience helpful. Full-time, year-around position, offering salary based on qualifications, plus full benefits. Call 414-739-3681, or send letter and resume, including expected salary range and names of references to Mr. R. Whitcomb, Personnel Director, P.O. Box 599, Appleton, Wt 54912.

•PROGRAMMERS
•SOFTWARE SPECIALISTS



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To qualify, you must have extensive experience supporting UNIVAC DMS 1100 software or the UNIVAC ASCII COBOL compiler. Experience in a TIP/CMS environment is strongly preferred.

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You will conduct performance analysis of hardware, software, and applications in order to determine system capacity, develop effective long-range replacement/upgrade strategies and optimize use of computer equipment. A technical degree (Math, Physics, Computer Science, etc.) and a computer background with experience in performance analysis or systems programming is desired.

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Requires operating experience on peripheral hardware for either UNIVAC 1100/20/40 or 80. ECL knowledge is also desirable.

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UNITED AIRLINES

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Salary area $33,000

A major Houston area energy company has created a new data processing management position with two systems managers report to it. Emphasis will be on maturity in human relations and corporate leadership capabilities and systems development. A recent background in an IBM 370/OS, COBOL environment is required; and data base experience would be helpful, but an energy industry background is not necessary.

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Your responsibilities will consist of educating customers, systems analysts and Marketing staff in the operation of our business systems. You will have an opportunity to be creative and develop curriculum associated with these products. This position requires a person who is a self-starter and who has 2-3 years experience in the following areas:

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- Knowledge of interactive or time sharing systems.
- Field experience as a Systems Analyst/Programmer with Business Applications knowledge.
- Programming experience in COBOL, RPG II and/or BASIC or all three languages.

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Your responsibilities will consist of researching, developing ideas and writing course materials associated with both Computer and Word Processing programs. You will have an opportunity to work with existing course trainers, Marketing personnel and other important groups to formulate the needed materials for implementation into offered courses for Sales, Customer and internal Marketing organizations. This position requires a person who has 2-3 years experience in the following areas:

- Development experience - course design through implementation.
- Prefer knowledge of Computer/Word Processing or related industry.
- Creative writing skills.
- Ability to work with various organizations and take on project responsibilities.
- Prefer college education or specialized training in this area.

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A career opportunity exists for a person who enjoys the challenge of educating customers and internal marketing people on the utilization of computer hardware and operating system features. You will have the opportunity to be creative and apply your knowledge in the development of new courses as well as modification of existing programs. This position requires a person:

- Who is creative and self-starting
- Who has at least 3 years experience in the following areas:
  - — Instructional experience in hardware and/or Operating Systems to Customers. Prefer Virtual Storage Systems
  - — Knowledge of interactive and time sharing systems
  - — Field Experience as a Systems Analyst/Programmer with applications knowledge
  - — Excellent programming experience in RPG II and COBOL
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You will be involved in systems training, developing and debugging software and act as a consultant in providing technical support in the correction of deficiencies and the design of new systems.

Interested candidates are asked to send resume to Mead Corporate Staff Personnel, Dayton, Ohio 45463.

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Beaverton, OR 97005

G

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As Manager, Corporate Data Center, the selected candidate will provide comprehensive service and support to internal systems users including the development of facilities management applications and systems software support. Due to this recent expansion of our Data Center, key responsibilities will include the recruiting, development and training of a medium sized DP team. A BS/MS in Computer Science coupled with experience in data center operations and software project management is essential.

We offer the qualified candidate an excellent commensurate compensation program, including relocation assistance. For confidential consideration, forward detailed resume in strictest confidence to:

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  - **— time-sharing — compiler designs/developments (high-level block structured lengueges) — SW tools design**
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A major Houston area energy company hes created e new data processing management position with two systems menagers raport to it. Emphesis will be on meturity in human reletions end corporeta leadership cepebilities and systems development. A recent background in an IBM 370/OS, COBOL environment is required; end deta base experience would be helpful, but an energy industry background is not nacassary.

For further informetion, please contect Tom Rischer or Jim Pate at (713) 658-9898.

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(312) 346-9400

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Saxon Business Products, Inc., a major Miami headquartered leader in the expanding photocopier industry is currently seeking professionals for its expanding MIS department. Continued growth has necessitated the upgrading of our hardware and software to support our Distribution, Marketing, Manufacturing and Financial groups. Honeywell Level 66 experience desired although a Honeywell 2000 background combined with a willingness to upgrade one's technical skills would be considered. We have a GCOS operating system utilizing DM IV software; IDS II data base, NPS, TPS and Cobol 74.

SYSTEMS ANALYSTS

Business applications experience in diversified disciplines including order processing, financial and inventory systems. Heavy user interface experience in the private business sector a must.

PROGRAMMER ANALYSTS

Two to three years of Cobol programming experience in Marketing, Manufacturing of Financial areas. While the majority of our openings are for Level 66 experienced candidates, we can accomodate a limited number of Honeywell 2000 or IBM experienced personnel desirous of learning our new software systems.

TECHNICAL SUPPORT ANALYSTS

Experienced in providing vendor software support, hardware/software problem analysis, programming/ operations support and establishing technical requirements. Must be experienced in Honeywell GCOS operating system.

LEAD OPERATOR

Operator experience on Honeywell 6000 hardware and related peripheral equipment. Must be capable of identifying causes of computer malfunctions, performing test operations, setting up and operating peripheral equipment, maintains operational schedules and directing other operators.

Saxon offers an excellent starting salary, comprehensive company paid benefits including a complete paid relocation to the Miami area. Send resume and salary history (a must) in confidence to:

Ronald A. Victor
Manager Employment
Saxon Business Products, Inc.
13900 N.W. 57th Court
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saxon

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- **Demonstrated ability to lead projects**
- **Ability to program in SIMSCRIPT**
- **Willing to relocate to So. California**

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- **Ability to program in FORTRAN and/or SIMSCRIPT**
- **Understand structured programming techniques**
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Software Development Department

CACI, Inc.-Federal
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Mgr Business Syst To $28K
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EDP Audit finl sys To $28K
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PROGRAMMER ANALYST

Immediate Opening

To analyze and develop computer programs for scientific and management applications. Work with researchers and management to fulfill their computer needs. Modify and document existing programs as required, and write usage and procedure manuals.

REQUIREMENTS: BS with emphasis in statistics and/or mathematics or MS in computer science. FORTRAN experience necessary; some Assembler experience on IBM 1800, IBM 1130 or PDP-11/24 helpful. Will consider recent graduates. Send resume with references and salary history to:

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The University of California's Los Alamos Scientific Laboratory, a multi-faceted national R&D facility, is seeking a user-oriented professional to work in its Computer Sciences and Services Division.

As part of the Customer Service Group, the incumbent will assist Laboratory divisions with computing system acquisitions within requirements set forth by the Department of Energy (DOE). The position involves coordination of proposals for hardware, software, and related computing services; review of Laboratory requirements for new computing applications and for enhancements of the Laboratory's several hundred currently installed systems; preparation of formal DOE proposals for acquistions exceeding approval authority; interface with internal and external administrative organizations; and participation in the development of responsive Laboratory-wide computer policies and plans.

The successful candidate must have a B.S. or M.S. in computer science or related field, or in other degree field with strong relevant computer background; and must be able to communicate effectively with both technical and administrative personnel. Experience with software/hardware development, especially in systems configuration, is preferred.

The Laboratory's powerful computing facilities include a CRAY-1 computer, four CDC 7600's, two CDC 6600's, two CDC Cyber 73's, an IBM 370/148, and numerous minicomputers, all operating in a network environment.

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SRZ Software Services, Inc.
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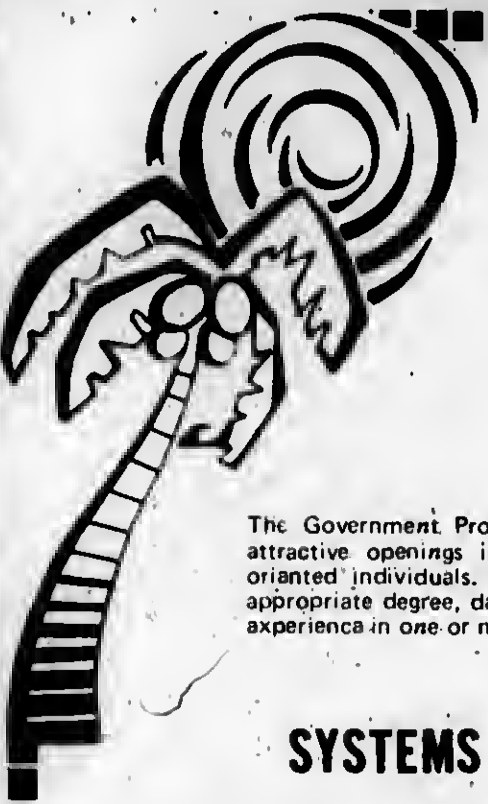

INFORMATION SYSTEMS OPPORTUNITIES

The Government Products Division of Pratt & Whitney Aircraft has a number of attractive openings in West Palm Beach for Management Information Systems-oriented individuals. Desirable background for these positions should include an appropriate degree, data base experience for new systems development, and 2-7 years experience in one or more of the following areas.

SYSTEMS DEVELOPMENT ANALYSTS

Product Support Systems

- Cobol experience
- Emphasis on order entry commercial applications

Financial Systems

- Must understand inter-relationship of all financial systems functions
- Applications DB design experience desirable

Manufacturing Systems

- Experience in user requirements definition, system design, development and implementation in a job shop manufacturing environment

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- Data dictionary or DBMS experience
- Familiar with business systems planning methodology

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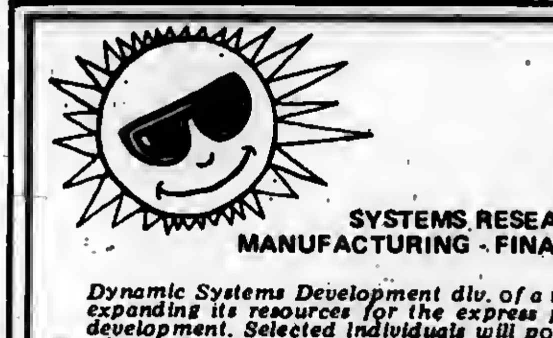

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The Environment: IBM 370/168, MVS, IMS DB/DC, TSO.

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Announcement Number 2130G-36-02
Salary Range $25,189 - $33,758

A top administrative position with direct impact in decision making processes. Overall responsibility for organizational structure, policy, goals, and objectives as well as evaluation of the division.

Minimum Qualifications:

Graduation from college with major course work in Business or Public Administration, Systems Design, or closely related fields. (Master's Degree is preferred). A minimum of five (5) years of experience in Systems Design including some administrative experience is required. An equivalent combination of education and experience will be accepted in identifying qualified applicants.

Senior Systems Analyst

Announcement Number 1483G-30-02
Salary Range $18,782 - $25,189
Two (2) Positions available

This is advanced technical work in Data Processing Systems. The position requires the incumbent to work with a great deal of independence and assume responsibility for planning and management within assigned areas.

Minimum Qualifications:

Applicants must have a Bachelors Degree with training in Business Administration, Systems Design and/or Computer Science. Five (5) years of experience in Data Processing, three (3) of which have been in programming and systems design is also required. Knowledge of COBOL Programming, Data Base, and Tele Processing is desirable. An equivalent combination of education and experience will be accepted in identifying qualified applicants.

SENIOR PROGRAMMER

Announcement Number 1473G-29-01
Salary Range $17,909 - $23,982

This is advanced technical work which is primarily concerned with the preparation of various operating instructions for an electronic digital computer system.

Minimum Qualifications

Applicants must be high school graduates and have supplemental coursework in programming, Business Administration, Engineering, or closely related fields. Knowledge of DEC Assembly Language is required. Experience with RSX-11M operating system and support of telecommunciations on a 16bt minicomputer is highly desirable. An equivalent combination of education and experience will be accepted in identifying qualified applicants.

PROGRAMMER TRAINEE

Announcement Number 1470G-19-01
Salary Range $10,920 - $14,474

This is basic technical work in the development and maintenance of computer programs.

Minimum Qualifications

Applicants must be high school graduates with additional coursework in computer programming, either from computer manufactures or at college or technical school level and at least six (6) month's experience in Data Processing. An equivalent combination of education and experience will be accepted in identifying qualified applicants. Position has promotional potential after nine (9) months.

SEND RESUMES/APPLICATIONS TO:

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County Administration Bldg.
Upper Marlboro, Maryland 20870
or call
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CLOSING DATE: October 16, 1978

SOFTWARE PROGRAMMER
Denver

Rapidly growing energy resource service company headquartered in Denver has immediate need for a light to intermediate level Software Programmer to work with data base support group using IDMS on IBM 370/145, DOS/VS. Minimum 1 year IDMS experience. TP or system programming experience helpful. Send resume including salary requirements to:

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• Sr. Real-Time Applications Programmer

Minimum of 5 years experience in FORTRAN and Assembly language programming of scientific and real-time applications. Familiarity with minicomputer architecture and at least one of the following operating systems is required: DEC RSX-11M, DG-RDOS.

• Scientific Applications Programmer

BS degree in Engineering, Science or Math with major credits in Computer Science or equivalent computer programming experience. Should have experience in FORTRAN for scientific applications. Familiarity with a minicomputer operating system an asset.

SYSTEM PROGRAMMER

To aid in the development of interface Drivers in Assembly language for a variety of minicomputers and to implement FORTRAN support systems including an assembler and simulator.

You will have a minimum of 2 years experience on the systems level in one or more minicomputer operating systems, such as: VAX, PDP-11 Series, NOVA/ECLIPSE, HEWLETT-PACKARD, INTERDATA and VARIAN. Strong Assembly language and FORTRAN skills required.

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The successful candidate will hava as a minimum a bachelor's degree and 5 to 8 years of solid systems design and implementation experience with a track record of continuous professional growth and increasing achievement, including successful project leadership experience. A strong technical background with emphasis on design of both batch and on-line systems solutions is required, as is a working knowledge of telecommunications concepts.

Prior experience with financial systems is highly desirable, especially in tha areas of financial data base, reporting and analysis systams, large scale financial consolidations, and currency translation. Tha candidate must be capable of designing and implementing financial applications on a variety of computing hardware - both main frames and dedicated systems utilizing both custom davaloped and packagad software. Familiarity with timesharing and servica buraaus is highly desirable.

This position requires excellent oral and written communication skills, a high dagrea and quality of user interfaca, and the ability to work effectively as part of a small team that bears complete responsibility for development and implementation.

LEAD PROGRAMMER

Two positions available. The successful candidate will possess 2 to 4 years of experience, with a minimum of 2 years of course work (B.S. degree preferred) in an appropriate discipline.

For one of these positions, the ideal candidate will possess large mainframe experience. Heavy COBOL is required, with good FORTRAN desirabla. A working knowledge of the operating system and job control is essential. Experience of working with or in a service bureau environment is desirable.

For tha other position, the ideal candidate will have indepth experience with IBM System 34, System 32, or System 3 utilizing RPG/II. Working knowladge of Systam utilities, programming aids, and job control is essantial.

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Need 2-5 years programming experience, COBOL or ALC, to develop and maintain oil & gas and financial application programs. Position requires excellent programming skills with forward potential in Systems Analysis and Design.

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Need 3-5 years systems programming experience, primarily in OS Systems. Prior DOS to OS conversion experience is a plus. Responsibilities include SYSGEN, Software Planning, Performance Measurement, Technical Support and ALC coding.

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SYSTEMS ANALYST PROGRAMMER

Weltronic Co., an industry leader in the design and implementation of automated plant monitoring and control systems has an opening for a systems analyst programmer. Position requires experience in a real time disk based minicomputer environment, preferably in the manufacturing monitoring and control area. Prior use of structured design and programming methods desired. FORTRAN and Assembly language experience a must. Person must be capable of taking a system from conception to installation. Requires ability to interface with customers and engineers. Approximately 20% travel involved.

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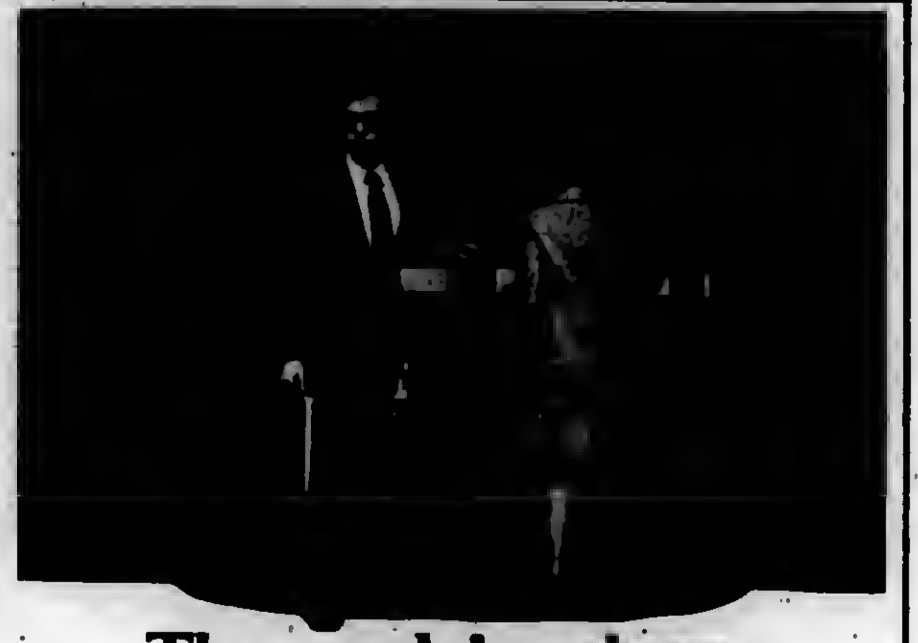

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HANES HOSIERY, a division of Hanes Corporation, a Fortune 500 Company with headquarters in Winston-Salem, North Carolina has openings for systems planning and development personnel.

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Candidate should have a minimum of 4 years total DP experience and at least 1 year as a Systems Analyst.

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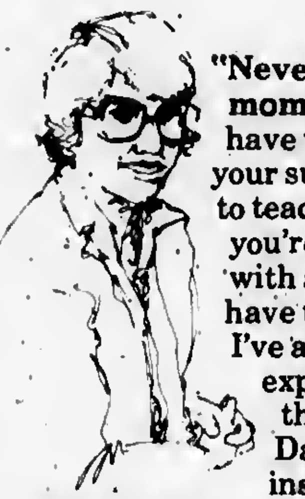

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Send us your resume, with this ad to Jon Zion at Data General Corporation, Route 9, Mail Stop 6-1, Southboro, MA 01772. Or call him collect at (617) 485-9174. Data General is an equal opportunity employer, M/F.

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Twenty-two year old Norwegian wants contact with computer center dealing with BANKING/BATCH UPDATING/ON LINE.

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Excellent opportunity for growth. Salary and incentives commensurate with experience. Will prove attractive to data processing managers currently earning in excess of $25,000.

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We seek Systems Analysts, Systems Programmers or Program Support Representatives to be responsible for maintaining Amdahl's excellent reputation in supporting our customers' complex software control systems.

You will be the Amdahl interface to 470V system customers in all software-related functions including:

- Problem Determination
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- System Generation Guidance
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Your maintenance-oriented background includes experience with MVS and/or VM, and you will find it very helpful to have JES2 or JES3 experience. In addition, you possess the ability to read dumps and write code to resolve system problems.

Qualified candidates are invited to respond to Buddy Taylor at the Amdahl office nearest them:

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301/657-8200 (collect)

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Large northern Nevada NYSE corporation is seeking an individual with five to ten years experience in software systems with recent experience in:

- DOS/VS system generation and maintenance
- CICS/VS system generation and maintenance
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The candidate must possess good communication skills. Will provide technical and application software support. Must be able to independently trouble shoot system and application software problems. Will assist in the evaluation and selection of new hardware and software now planned.

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In addition to an excellent salary and benefit package, the selected candidate will receive indepth training in state-of-the-art software technology and open-ended opportunities for career growth. For consideration send a resume to Tarie Yee, PANSOPHIC SYSTEMS, INC., 709 Enterprise Drive, Oak Brook, IL 60521, or,

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PANSOPHIC

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Transamerica Information Services, a major commercial business data processing organization located in Los Angeles, is seeking experienced and highly qualified personnel interested in outstanding career opportunities. Current positions available for proven professionals include the following.

MVS SYSTEM PROGRAMMER

Primary duties will include SCP maintenance, PUT and SU installations, SYSGEN, IBM PSR interface, and problem determination and resolution. Position requires comprehensive system programming and operating experience with large processors, MVS, JES 2, TSO, SMP service aids, debugging and VSAM. Knowledge of 168MP, and of subsystems designs and conventions helpful.

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Senior level Systems Programmer required with CICS or other large teleprocessing monitor experience end a working knowledge of MVS, JES 2 and TSO. Expertise with EP VTAM/NCP and TCAM helpful. Responsibilities will include debugging and tuning CICS, maintaining JES 2, performing TSO support activities, and conducting associeted evaluations and recommendations. Will assume project leadership responsibilities,

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Experienced Analyst, required to provide technicel maintenance support of data communications applications, including troubleshooting line and equipment problems and coordinating activities between users and vendors. Will perform related analytical support and plenning activities. Experience with digital and analog aspects of modems, time division multiplexers, terminal circuits and front end processors required. Knowledge of IBM protocols and equipment is desirable.

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Position responsibilities will include developing forecasting tools end techniques and interface with end users for forecast development. Deta processing experience with applications programming background and knowledge of large scale systems work load forecasting required. Technical expertise should include knowledge of computer resource utilization and SMF accounting measures.

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Primary responsibilities in herdware monitoring and analysis. Will develop monitoring tools and techniques and assume project leadership for performence related studies. Tesdate MS series experience and knowledge of large scale IBM systems required. BS scientific field and project leadership experience preferred.

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Responsible for providing DP systems consultation to affilietes including conducting requirement studies, systems design reviews and testing, providing detailed design and programs specifications, user and technical staff treining end assuming projact supervision. Qualifications required include edvanced ecademic training and professional experience with expertise in COBOL and OSJCL. Project leadership end consulting experience preferred. Data base experience helpful.

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Position requires a minimum of 3 years OS applications, with high proficiency in ANS and COBOL. Must have personally designed, program and installed a multi module medium to large scale OS application. Other helpful experience would include on-line transaction applications (CICS), interactive programming (VM/370), BOM, MRP, shop floor, costing, inventory, and structured designing and programming.

Competitive salary and comprehensive benefits are offered as well as Connecticut shore location.

For confidential consideration please forward resume and salary requirements to: Harris Corporation, Web Press Division, Personnel Manager, Mechanic St., Pawcatuck, CT 02891.

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- Networks/Telecommunications
- Computer Performance Evaluation
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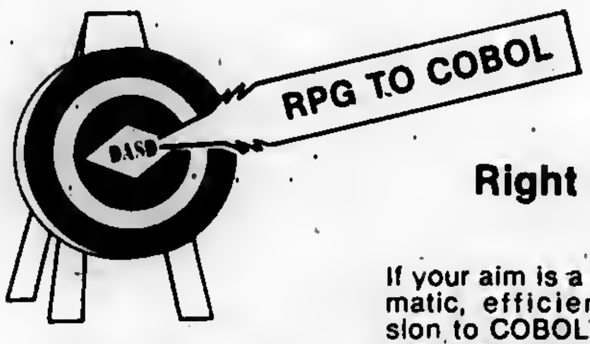

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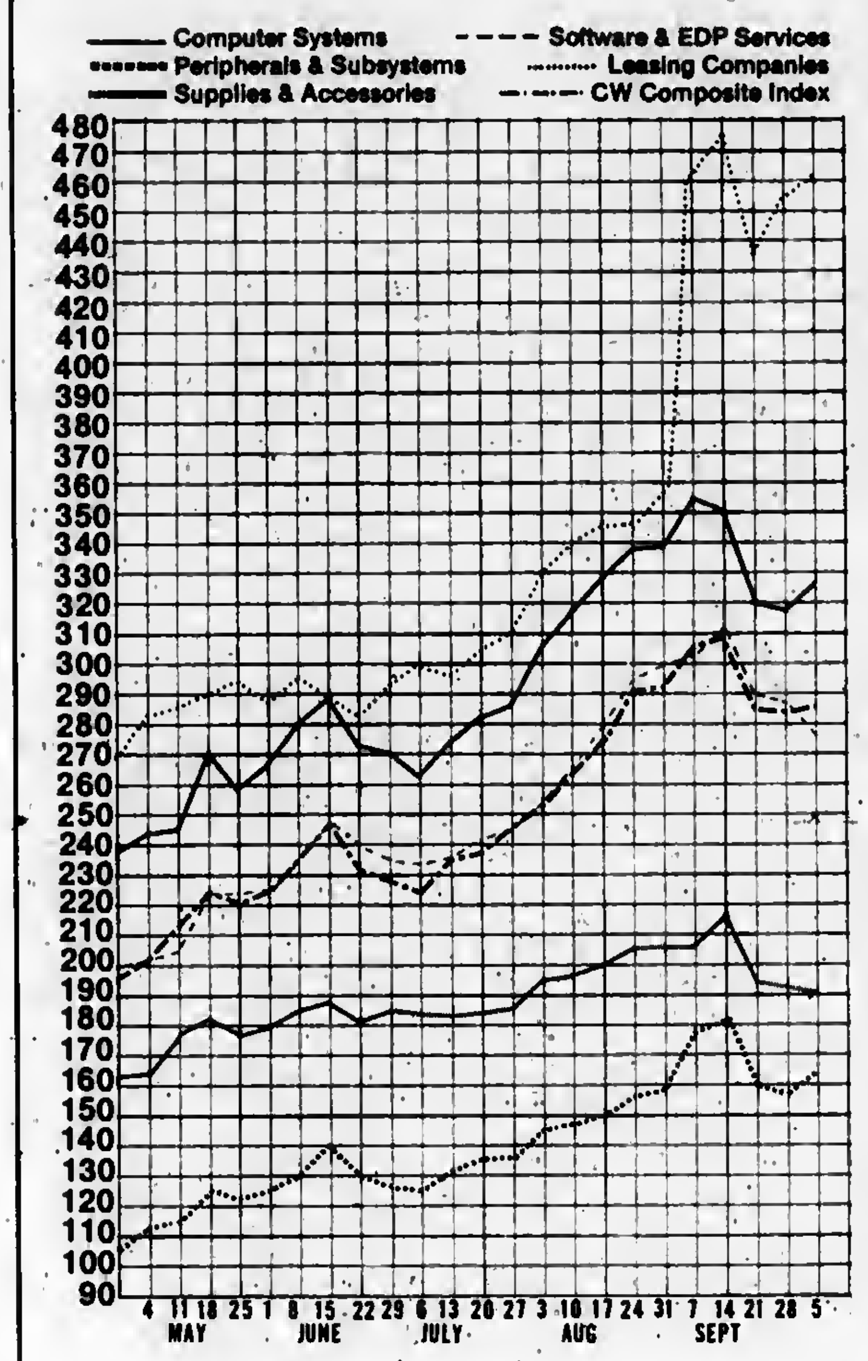

Earnings Reports

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Three Months Ended June 30

	1978	a1977
Shr Ernd	.....	$.40
Revenue	$4,045,752	3,515,894
Tax Cred	.....	207,050
Earnings	(269,843)	527,342
9 Mo Shr	.....	.39
Revenue	8,603,312	7,028,544
Tax Cred	.....	207,050
Earnings	(912,941)	509,016

a-Restated to reflect a change in accounting method.

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Three Months Ended June 30

	1978	1977
Shr Ernd	$.30	$.23
Revenue	8,711,278	5,196,686
Earnings	962,958	725,813
6 Mo Shr	.55	.42
Revenue	12,676,262	9,932,330
Earnings	1,744,254	1,317,891

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Three Months Ended June 30

	1978	a1977
Shr Ernd	$.47	$.42
Revenue	107,865,000	88,399,000
Earnings	3,511,000	3,172,000
9 Mo Shr	1.03	1.11
Revenue	290,883,000	257,282,000
Earnings	b7,721,000	8,381,000

a-Restated. b-Includes net gain of $713,000 from sale of interest in a joint venture less write-off of goodwill of a subsidiary.

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Year Ended June 30

	1978 (000)	1977 (000)
Shr Ernd	$2.90	$2.22
Revenue	1,155,187	920,285
Earnings	46,200	37,055
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Revenue	329,851	293,236
Earnings	17,483	13,898

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	1978	1977
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a-Restated.

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1. Title of publication: Computerworld
2. Date of filing: October 2, 1978
3. Frequency of issue: Weekly (except single combined issue for the last week in December and first week in January).
3a. No. of issues published annually: 51
3b. Annual subscription price: $25.00
4. Location of known office of publication: 797 Washington St., Newtonville, Mass. 02160 (Middlesex County).
5. Location of the headquarters of general business offices of the publishers: 797 Washington St., Newtonville, Mass. 02160.
6. Names and addresses of the publisher, editor and managing editor: Publisher, Patrick J. McGovern, 60 Austin St., Newtonville, Mass. 02160. Editor, E. Drake Lundell, 797 Washington St., Newtonville, Mass. 02160. Managing Editor, Nancy French, 797 Washington St., Newtonville, Mass. 02160.
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8. Known bondholders, mortgagees and other security holders owning or holding 1% or more of total amount of bonds, mortgages or other securities: International Data Group, 60 Austin St., Newtonville, Mass. 02160.
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10. Extent and nature of circulation:

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B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail subscriptions	86,994	94,606
C. Total paid circulation	86,961	91,504
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	3,033	3,102
E. Total distribution (Sum of C and D)	89,994	94,606
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	6,121	5,990
2. Returns from news agents	None	None
G. Total (Sum of E, F1 and 2 - should equal net press run shown in A)	96,115	100,596

I certify that the statements made by me above are correct and complete.

W. Walter Boyd
President

TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 4, 1978

All statistics compiled, computed and formatted by
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Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	51 5/8	-3 5/8	-6.5
N	BURROUGHS CORP	59- 87	76 1/4	+ 1/8	+0.1
O	COMPUTER AUTOMATION	23- 44	31 1/4	-1 3/4	-5.3
N	CONTROL DATA CORP	23- 44	38 1/4	+1 3/4	+4.7
O	CRAY RESEARCH INC	21- 74	67	+6	+9.8
N	DATA GENERAL CORP	42- 71	59 3/4	-2 1/8	-3.4
N	DATAPOINT CORP	34- 75	64 5/8	-1	-1.5
N	DIGITAL EQUIPMENT	39- 54	48 5/8	- 1/8	-0.2
N	ELECTRONIC ASSOC.	2- 13	10 1/4	+ 1/2	+5.1
A	ELECTRONIC ENGINEER.	11- 19	14 5/8	- 1/8	-0.8
O	FOUR-PHASE SYSTEMS	19- 46	38	- 7/8	-2.2
N	FOXBORO	28- 40	37 1/4	0	0.0
O	GENERAL AUTOMATION	7- 26	17 1/2	- 5/8	-3.4
O	GRI COMPUTER CORP	1- 2	2 1/2	+ 3/4	+42.8
N	HEWLETT-PACKARD CO	62- 93	87 5/8	+ 3/4	+0.8
N	HONEYWELL INC	43- 72	65 7/8	+1 1/2	+2.3
N	IBM	236-305	282	+7	+2.5
O	MANAGEMENT ASSIST	9- 29	23 1/4	+1 3/4	+8.1
O	MICRODATA CORP	10- 23	17 7/8	- 5/8	-3.3
O	MINI-COMPUTER SYST	5- 8	7 1/2	0	0.0
O	MODULAR COMPUTER SYS	7- 17	14 3/4	+1 1/4	+9.2
N	NCR	37- 67	61 1/2	+1 7/8	+3.1
N	PRIME COMPUTER INC	20- 43	36 1/8	+ 7/8	+2.4
N	PERKIN-ELMER	17- 28	27	+2	+8.0
N	RAYTHEON CO	29- 58	47 3/4	+ 3/8	+0.7
N	SPERRY RAND	33- 49	43 5/8	- 5/8	-1.4
A	SYSTEMS ENG. LABS	11- 24	17	+ 1/4	+1.4
A	WANG LABS.	12- 32	26 3/4	+1 3/8	+5.4

LEASING COMPANIES

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
C	BOOTHE COURIER CORP	13- 20	20 1/2	+1 1/4	+6.4
O	COMDISCO INC	5- 20	19 1/4	+1 1/2	+8.4
A	COMMERCE GROUP CORP	1- 1	5/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	4 3/4	- 1/2	-9.5
M	DATRONIC RENTAL	1- 3	2 1/2	+ 1/4	+11.1
A	DCL INC	3- 5	4	- 3/8	-8.5
N	DPF INC	8- 14	12 5/8	+1 1/4	+10.9
N	ITEL	16- 36	32 1/2	+ 5/8	+1.9
N	LEASCO CORP	24- 36	32	+ 5/8	+1.9
O	LEASPAC CORP	1- 4	2 1/2	0	0.0
A	PIONEER TEX CORP	4- 7	4 3/4	- 1/4	-5.0
N	U.S. LEASING	13- 20	17 7/8	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 3/8	- 1/8	-8.3
O	ANACOMP INC	8- 22	16	- 1/4	-1.5
A	APPLIED DATA RES.	8- 17	14 1/8	- 7/8	-5.8
N	AUTOMATIC DATA PROC	24- 36	32 3/4	+1 3/4	+5.6
O	COLEMAN AMERICAN COS	1- 2	1 1/2	0	0.0
O	COMPU-SERV NETWORK	7- 12	8 1/2	+ 1/4	+3.0
O	COMPUTER HORIZONS	1- 9	6 3/4	-1 1/2	-18.1
O	COMPUTER NETWORK	8- 16	11 3/4	- 1/8	-1.0
N	COMPUTER SCIENCES	8- 17	13 7/8	- 1/8	-0.8
O	COMPUTER TASK GROUP	1- 4	3 1/4	0	0.0
O	COMPUTER USAGE	2- 4	3 3/4	0	0.0
C	COMSHARE	6- 19	16 1/4	-1	-5.7
O	DATA DIMENSIONS INC	4- 9	7 3/8	+ 1/4	+3.5
O	DATATAB	1- 2	1 1/2	+ 1/8	+9.0
N	ELECTRONIC DATA SYS.	15- 25	21 3/8	- 1/2	-2.2
O	INSYTE CORP	1- 3	1 5/8	- 1/8	-7.1
O	IPS COMPUTER MARKET.	2- 3	3	- 1/4	-7.6
O	KEANE ASSOCIATES	3- 6	5 3/8	- 5/8	-10.4
O	KEYDATA CORP	1- 3	2 1/8	+ 1/8	+6.2
A	LOGICON	11- 19	15 1/4	0	0.0
A	MANAGEMENT DATA	1- 1	1/8	- 3/4	-85.7
A	NATIONAL CSS INC	15- 36	29 3/8	-1 1/4	-4.0
O	NATIONAL DATA CORP	7- 13	10 7/8	0	0.0
A	ON LINE SYSTEMS INC	17- 30	26	- 5/8	-2.3
N	PLANNING RESEARCH	4- 10	8 7/8	+ 1/4	+2.8
O	PROGRAMMING & SYS	1- 1	1 1/2	+ 1/4	+20.0
O	RAPIDATA INC	3- 7	6	- 1/2	-7.6
O	REYNOLDS & REYNOLDS	18- 36	29	+ 1/2	+1.7
O	SCIENTIFIC COMPUTERS	3- 9	8	- 3/8	-4.4
O	TYMSHARE INC	18- 33	27 7/8	+ 1/2	+1.8
A	URS SYSTEMS	5- 8	7 1/4	- 3/8	-4.9
N	WYLY CORP	1- 7	6 1/8	+ 1/4	+4.2

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	28 1/4	+1 5/8	+6.1
O	ADVANCED MEMORY SYS	7- 18	17 1/8	+ 3/4	+4.5
N	AMPEX CORP	10- 19	17	+ 3/4	+4.6
O	ANDERSON JACOBSON	5- 10	7 1/2	- 1/4	-3.2
N	APPLIED DIG DATA SYS	13- 22	14 7/8	+ 1/2	+3.4
O	BEEHIVE INT'L	4- 7	5 7/8	- 1/2	-7.8
A	BOLT, BERANEK & NEW	6- 14	13 1/8	- 3/8	-2.7
N	BUNKER-RAMO	10- 20	18 5/8	+1 5/8	+9.5
A	CALCOMP	3- 13	11	+ 1/8	+1.1
O	CAMBRIDGE MEMORIES	3- 9	6 1/4	- 3/8	-5.6
N	CENTRONICS DATA COMP	16- 36	36 1/4	+2 3/4	+8.2
O	COGNITRONICS	1- 4	2	- 1/4	-11.1
O	COMPUTER COMMUN.	6- 12	10 1/4	+ 1/4	+2.5
O	COMPUTER CONSOLES	4- 10	8 1/2	- 1/4	-2.8
A	COMPUTER EQUIPMENT	3- 6	5 1/4	+ 1/8	+2.4
O	COMPUTER TRANSCEIVER	1- 3	3 3/8	+ 1/4	+8.0
O	COMTEN	9- 38	33	+1 1/4	+3.9
N	CONRAC CORP	19- 26	21 1/2	- 1/4	-1.1
O	DATA ACCESS SYSTEMS	3- 14	12	0	0.0
O	DATA 100	9- 20	19 1/4	0	0.0
A	DATA PRODUCTS CORP	15- 25	20 1/2	+2	+10.8
O	DATUM INC	2- 6	4 5/8	0	0.0
O	DECISION DATA COMPUT	2- 6	4 3/4	+ 3/8	+8.5
O	DELTA DATA SYSTEMS	1- 1	3/4	+ 1/8	+20.0
A	DOCUMATION INC	6- 34	28	-1	-3.4
O	DATARAM CORP	6- 31	28 1/4	+1 3/4	+6.6
N	ELECTRONIC M & M	4- 9	7 1/8	+ 1/2	+7.5
O	FABRI-TEK	1- 2	1 1/4	- 1/8	-8.6
O	GENERAL COMPUTER SYS	1- 3	2 1/4	- 1/8	-5.2
N	HAZELTINE CORP	10- 17	16 3/4	+1 3/4	+11.6
N	HARRIS CORP	17- 36	35 1/8	+1 1/8	+3.3
O	INFOREX INC	6- 11	9 7/8	+ 3/8	+3.9
O	INFORMATION INTL INC	8- 12	9 1/4	- 1/2	-5.1
O	INTEL CORP	39- 62	55	+2 1/2	+4.7
A	LUNDY ELECTRONICS	4- 8	7 1/2	+ 5/8	+9.0
O	MSI DATA CORP	12- 19	13 3/4	- 7/8	-5.9
N	MEMOREX	27- 59	48 3/4	+ 1/4	+0.5
N	MOHAWK DATA SCI	6- 15	11 1/8	- 1/4	-2.1
O	OMEX	2- 4	5 1/2	+2	+57.1
O	PENRIL CORP	5- 12	11 3/4	+1 3/4	+17.5
N	PERTEC CORP	9- 17	15 1/8	+ 3/8	+2.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 1/2	0	0.0
O	RECOGNITION EQUIP	7- 13	10 5/8	- 1/4	-2.2
O	SCAN DATA	1- 5	2 5/8	- 1/4	-10.4
N	STORAGE TECHNOLOGY	19- 46	32 3/4	+1 3/4	+5.6
O	T BAR INC	11- 20	17 3/4	- 3/4	-4.0
O	TALLY CORP.	4- 9	7 1/2	- 1/8	-1.6
A	TEC INC	6- 13	10 1/2	- 1/2	-4.5
N	TEKTRONIX INC	33- 50	47 1/4	+ 3/4	+1.6
N	TELEX	3- 9	7 1/2	0	0.0
O	TESDATA SYSTEMS CP	13- 23	15 1/2	0	0.0
O	WILTEK INC	1- 1	1 3/8	+ 1/2	+57.1

SUPPLIES & ACCESSORIES

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 4 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	9 3/8	- 3/8	-3.8
O	BALTIMORE BUS FORMS	2- 5	2	- 1/2	-20.0
A	BARRY WRIGHT	14- 30	28 1/2	+2 1/4	+8.5
O	CYBERMATICS INC	1- 1	1	0	0.0
O	DUPLEX PRODUCTS INC	18- 30	25 3/4	- 1/2	-1.9
N	ENNIS BUS. FORMS	8- 17	13 1/2	+ 5/8	+4.8
N	3M COMPANY	43- 66	58 5/8	0	0.0
O	MOORE CORP LTD	26- 34	30 3/4	+ 3/4	+2.5
N	NASHUA CORP	18- 37	27 5/8	-4 1/8	-12.9
O	STANDARD REGISTER	20- 27	25	+ 1/4	+1.0
A	TAB PRODUCTS CO	8- 16	14 1/4	+ 1/8	+0.8
N	UARCO	19- 28	26 5/8	+1	+3.9
A	WABASH MAGNETICS	10- 22	20	+ 3/4	+3.8
N	WALLACE BUS FORMS	18- 33	27 3/4	- 1/2	-1.7

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ger Zip: 't Panic, Just Plan

By Don Leavitt
CW Staff

While the U.S. Postal Service has yet to define most of the details surrounding the where, why and how to use the nine-digit Zip Code [CW, Oct. 2], certain basic facts are known and a certain level of planning can be undertaken.

Analysis

Anything beyond long-range planning, however, is probably premature since the Postal Service is deliberately taking a slow approach to the whole question of implementation. Complete details aren't expected for at least a year and possibly not until the summer of 1980.

But a Postal spokesman has said that use of the extended Zip Code will be voluntary and that monetary incentives will probably be available to encourage it, much as such incentives are in place now to encourage presorting on the existing five-digit Zip Code.

The four-digit add-on — "we won't be doing anything to the current five-digit code" — will be all-numeric. Alphanumeric codes, such as those now used in Canada and the UK, were considered at one time, but they were ruled out, the spokesman said.

Presorting by mailers will "certainly be encouraged" and will involve sequencing on all nine digits, sorting on the existing five digits will be helpful to the Postal Service, but won't get the mailer any

(Continued on Page 8)

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NEWSPAPER

IBM 370-Compatible Units Emulate Two CPUs at Once

By Howard A. Karten
CW Staff

CHICAGO — Users of mid-scale IBM 370s and other systems in that performance range will receive yet another option this week when Nanodata Corp. of Buffalo, N.Y., announces its entry into the 370-compatible market.

The VMX 200 and VMX 400, which will be introduced here at the Fifth International Information Management Exposition & Conference (Info '78), possess performance characteristics that exceed the IBM 370/138 and 370/148, respectively, a spokesman claimed.

The systems rely on multibus, multiprocessor architecture to emulate a wide variety of mainframes, of which the 370s are only some. A main store bus, two I/O buses and two additional buses, as well as three types of processors, are said to provide the flexibility that acts as a bulwark against obsolescence caused by technological innovation.

The three types of processors are execution processors, supervisory processors and auxiliary processors. The supervisory processor is responsible for controlling and providing diagnostic functions for the entire machine, monitoring system resources and initiating automatic recovery in the event of failure of any part of the system.

In addition, it is said to allow remote diagnosis and updating of system microcode.

Info '78 opens today in Chicago. A special preview of the four-day Information Management Exposition & Conference follows Page 68.

A maximum of 13 auxiliary processors can be attached to the VMX 400, while the VMX 200 will accommodate up to four. These processors supply such services as system support, I/O

(Continued on Page 6)

CW Photo by A. Dooley

And the Winner Is . . .

Women runners speed across the finish line of the Bonne Bell Mini Marathon course in Boston last week as a minicomputer races to keep up with them. See story on Page 5.

Enhances Cobol, Infos

DG Adds High-, Low-End Eclipses

By Jeffry Beeler
CW Staff

NEWTON, Mass. — Data General Corp. last week expanded the Eclipse family's range of distributed processing applications when the company broadened the minicomputer line by adding two systems — one at the high end and another at the low end.

DG intends the entry-level system — designated the Eclipse C/150 — primarily for small, dedicated applications at the regional offices of Fortune 500 firms and other large users, according to a spokesman for the minicomputer manufacturer.

The high-end addition, meanwhile, will primarily perform large, multifunction applications as the host mainframe for major corporate divisions, the source explained.

With the two additional systems, the Eclipse line for the first time has penetrated the low end of the distributed processing applications spectrum and at the same time inched upward in that spectrum.

The dual introductions also broaden the Eclipse family's price range from $100,000 to $400,000 before to $55,000 to $500,000 now, the spokesman said.

DG described the top-of-the-line offering, which lacks a separate model number, as an enhanced M/600 with a maximum main storage capacity of 2M bytes. Previous M/600 versions accommodated only up to 1M byte.

Software Enhancements

As part of the same product announcement, DG also introduced enhancements to two of the Eclipse family's software products — Cobol and Infos file management package.

(Continued on Page 4)

User Gets $270,000 Award In GA Contract Dispute

By Tim Scannell
CW Staff

CEDAR RAPIDS, Iowa — The Federal District Court here has found General Automation, Inc. guilty of breach of contract in a dispute over an inoperative computer system and has ordered the firm to pay $270,000 in actual damages to William C. Brown Publishing Co. of Dubuque.

The court, after a one-day hearing, ruled in favor of the user in a suit that charged GA with fraud and reckless disregard of customer interests. However, the dollar award came nowhere near the original $750,000 in actual damages and $10 million in punitive damages sought from the Anaheim, Calif.-based computer firm.

The litigation centered around a GA DM-140 turnkey processing system and related software purchased by Brown in late 1975 to help distribute complimentary textbooks to college and university professors. The system was supposed to eliminate, or at least limit, duplicate book mailings — a common problem in the publishing industry, according to the publisher, Larry Brown. Unfortunately, the computer "never actually worked" and

(Continued on Page 8)

IN DEPTH

The software products industry has a great future — but just what is that industry? Martin A. Goetz offers his definition and predictions in this week's In Depth, which follows Page 68.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Match of AFDC, Detroit Police Rolls Brings 33 Arrests for Welfare Fraud

By Jake Kirchner
CW Washington Bureau

DETROIT — Thirty-three members of this city's police department have been fingered by a crime-fighting computer project and charged with welfare fraud.

The 33, all women, were indicted Oct. 4 after their names surfaced in a computer match that compared police department employee records with Michigan's welfare roles. The women have been charged with illegally receiving benefits under the state-administered Aid to Families with Dependent Children (AFDC) program.

DSS, headquartered in Lansing, performed the match at the request of the Detroit police department, according to Susan Stine, deputy director of the Special Operations Administration of Michigan's Department of Social Services (DSS). The police had heard several female employees were receiving AFDC benefits and wanted to identify any employee illegally receiving such benefits, Stine said.

Stine said she "was amazed and not too happy" when 33 women on the police force were found on both lists.

Irony of Matching

Not everyone has been enthusiastic about the computer matching. The women caught will probably lose their jobs and end up on full public assistance, thereby costing the taxpayers more money than was saved by the match, Stine noted.

"A lot of people feel the matches we have done have not been all that fruitful," she said, but insisted the project's real value is that it is "a very good deterrent."

Very few public employees will be tempted to commit welfare fraud in the future, Stine predicted, recalling that an earlier match involving state employees found several welfare cheaters on state legislators' payrolls.

Results of One Project

Michigan's matching program, similar to that employed by the U.S. Department of Health, Education and Welfare on the federal level (see story on Page 11), has been in operation for about two years.

During that time, DSS has performed several matches using employee data from private industry. The most controversial match has involved the "Big Three" automobile manufacturers, General Motors, Ford Motor Co. and Chrysler Corp. [CW, Jan. 23].

Despite public objections that such matches seriously infringe on the right of personal privacy, the auto makers turned over to DSS payroll information on their employees in Michigan. When matched against state welfare roles, 5,079 "raw hits" were made.

Of those 5,079 people found to be receiving AFDC benefits, Stine said, 707 cases have, as a result of DSS investigation, resulted in "closures or reductions." The cut-offs and reductions of AFDC benefits in those cases have produced a monthly savings to the government of $176,840, according to DSS figures.

Stine said there are approximately 2,300 cases from the auto makers still to be investigated, and no legal action has yet been taken to recover the fraudulently obtained money or to prosecute those caught in the match.

Private Sector Eager

Addressing the privacy issue, Stine agreed that some people find the matching program objectionable, but described the availability of computerized personal information as "the kind of world we live in now."

In fact, she said, not only have many private companies been eager to cooperate with the matching program, several have requested DSS investigations of their employees. Several matches have been performed on the premises of private companies using the firms' computers and AFDC tapes provided by DSS, she added.

In Washington, D.C., a spokesman for the HEW Inspector General's Office noted that private industry's voluntary cooperation with such matching programs is almost a moot point. In at least 37 states, welfare administrators have access to private employee records through state unemployment compensation insurance files, the spokesman pointed out. The insurance is paid by private companies for their employees.

On the Inside This Week

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SOFTWARE INDUSTRY ASSOCIATION

Women DPers Execute Smooth Runs in Boston

By Ann Dooley
CW Staff

BOSTON — "If I survive this, I can do anything," DPer Naomi Karten said before joining the ranks of more than 4,000 women running in the second annual Bonne Bell Mini Marathon held here last week.

The women runners who surged along the 6.2-mile course through this city varied in age, occupation and running experience. The youngest was six and the oldest was 77. Many had never run competitively.

Karten, whose finishing time was 53:17, works as a project supervisor in programming financial and marketing applications for Massachusetts Blue Cross/Blue Shield. She started running about a year and a half ago.

"Running has been dominating my life recently. My working day is usually filled with tensions and now I can go home and run for an hour and there's no room for any tensions," she explained.

Early this spring, she convinced her husband, CW staff writer Howard Karten, to join her, and he now shares her enthusiasm although he hasn't achieved her distances. A programmer since 1969, Karten said her job involves working with the system used for billing Blue Cross subscribers.

The race was "thrilling," especially at the beginning when all the women were grouped together. It was "like making our own parade," she said.

Karten runs approximately 20 miles a week and vows she will improve her time in the next race she enters.

Another DPer who ran in last week's race is Diane Mahany, a manager of engineering administration for Honeywell, Inc. One of Mahany's functions is to help allocate DP resources for the computer center. The center's resources are shared among departments and the time and equipment need to be managed properly, she explained.

Mahanny, who picked up most of her technical knowledge on the job, said she has "lots of fires to fight," and finds running a "fine way to come down from pressures.

"Running gives me a sense of well-being that carries with me through the day," she noted.

A runner for two years, averaging three to five miles per workout, Mahany said she'd never seen so many people in her life as were participating in the race. There was such a large crowd that it took nearly four minutes just to begin running, she noted.

Immediately after the event, Mahany "felt somewhat let down." She ran in last year's race and had been planning and looking forward to the Bonne Bell all year, so the race itself seemed to go by too quickly, she said.

Eclipse Line Grows at High, Low Ends

(Continued from Page 1)

The Cobol enhancement consists of an automatic segmentation feature that reportedly permits the execution of programs whose memory requirements exceed an Eclipse computer's typical main storage capacity. As a result, users can run arbitrarily large programs without recompilation, the spokesman explained.

The other enhancement allows Infos to use applications programs written in PL/I, Fortran V and DG/L. Before the software announcement, the file management product accommodated only Cobol and RPG-II-written programs.

DG likened the expanded M/600 version in performance to the Digital Equipment Corp. Decsystem 20 and Prime Computer, Inc. Model 500. Unlike those two competitive systems, however, the latest high-end Eclipse model incorporated a three-level I/O management systen consisting of a 10M-byte multiplexer channel, independent I/O processor with an Eclipse instruction set and a 64K-byte local memory that serves as a front-end processor for low-speed peripherals.

The C/150, by contrast, belongs to the same product class as the DEC PDP-11/60 and the Hewlett-Packard Co. 3000 Series 33.

But whereas the HP Series 33 has no communications capabilities at present, the C/150 can use the RJE80 protocol to communicate synchronously at up to 56k bit/sec with either of the other two members of the Eclipse series.

Expanded-memory versions of the M/600 will typically operate in the classic DP room environment, where they will perform applications like payroll and budgeting, the source explained. Typical C/150 systems, on the other hand, will serve relatively simple application like order entry and data inquiry, while transmitting information from a remote locations to a host M/600.

The level-entry system, however, will also serve as a stand-alone unit, the spokesman stressed.

DG credited the C/150 with providing a 600-nsec machine cycle and supporting up to 256K bytes of main memory, eight 190M-byte disk units, 32 terminals, multiple 800- or 1,600 bit/in. tape units and 900 line/min printer. A realistic C/150 configuration, however, incorporated a 192K-byte CPU, 20M-byte cartridge disk subsystem, five Dasher CRT terminals, one 800 bit/sec tape system and a 180 char./sec Dasher LP2 printer.

Distributed Processing Capability

To make the C/150 suitable for distributed processing applications, the system is software-compatible with both the C/350 and the M/600, the spokesman said. Software shared by the three systems inclueds DG's Real-Time Disk Operating System (RDOS), Interactive Data Entry/Access (Idea) package and Infos.

The C/150's Idea software typically supports six to 12 users and is upward-compatible with the C/350 and M/600.

To further ensure the C/150's suitability for distributed processing, the system accepts the same DG peripherals as the C/350 and M/600. These peripherals include 50M-, 96M- and 190M-byte disk subsystems; 10M- and 20M-byte cartridge subsystems; 800- and 1,600 bit/sec tape units; and a choice of printers that output 30-, 60- and 180 char./sec as well as 300-, 600- and 900 line/min.

A minimum practical C/150 configuration consisting of a 128K-byte CPU, 10M-byte cartridge disk subsystem, 800 bit/in. tape unit, 60 char./sec Dasher TP1 terminal printer, RDOS, Infos and RPG-II costs $54,000. A typical maximum configuration with a 256K-byte CPU, 190M-byte disk subsystem, tape system, 16-line asynchronous line multiplexer, two Dasher CRT consoles, 12 additional Dasher displays, 600 line/min printer, RDOS, Infos, Idea, and Cobol sells for $144,000.

A typical enhanced M/600 configuration costs $516,000 and incorporates a 1.5M-byte processor, 4M-byte fixed-head disk unit, two 9-track tape systems, six 190M-byte disk units, a 60 char./sec Dasher console, two 900 line/min printers, synchronous communications controller, 32 Dasher CRT displays, Advanced Operating System, Infos, Idea and Cobol.

Deliveries of the C/150 and expanded-memory M/600 start next January from DG at Route 9, Westboro, Mass. 01581.

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Sometimes 500 at Once

Mini ‘Scores’ With 3,565 Women Runners

by Ann Dooley
CW Staff

BOSTON — While Bonne Bell Mini Marathon winner Joan Benoit set a record of 33:15 in the 6.2-mile, all-woman race here last week, a minicomputer tabulated her results and those of her competitors in "record time" for the event. The winner's time was announced only seconds after the 21-year-old Raleigh, N.C. student crossed the finish line.

A Honeywell, Inc. Level 6/47 computer was used to record finishes for the 3,565 runners who completed the race, which is named after the cosmetics firm. And that was quite a job, since at one point, as many as 500 runners crossed the finish line within 2-1/2 minutes, a Honeywell spokesman noted.

For the first time, the Bonne Bell race used a computerized recording system donated by Honeywell, and officials seemed pleased with the speed and ease of computing the results. Last year it took months to record the times and distribute the results, according to Sherry Brooks, race coordinator.

The automated system used last week was similar to the one used in the Boston Marathon earlier this year [CW, April 24], although it has been upgraded considerably since that time, according to Honeywell spokesman Jim Hannigan.

Racer Program

Honeywell used a specially designed software program called Runner Administration and Computerized Entry Routine (Racer) to provide finishing times along with a variety of statistical reports.

As each runner crossed the finish line, a race official punched a button wired to the Level 6/47 mini to record the exact time of each competitor — without using identifying numbers.

Runners were then funneled through a holding chute in the order in which they finished and runners' identifying numbers were written on a time sheet in order of finish. The numbers were then entered via CRT terminals on site and the system matched the order of the runners with the punched times to determine individual runners' times.

Chutes were closed after about 100 runners went through, and the finishing time sheets were numbered sequentially to denote which of the eight chutes a runner used. A group number was also assigned to each set of runners as they started through a newly opened chute.

As a further check, an official at the finish line wrote down the number of runners crossing the finishing line at 15-second intervals. The chute number, the group number and the manually recorded times were entered into the system for a three-way merge.

Merge Program Helps

The merge program took all the runners' times and numbers, sorted them into overall finish order and arranged them into five age groups.

Because the program was written to work asynchronously, it stopped computing when sheets of numbers were entered out of order. Such a practice ensured that the output could be generated chronologically and correctly, according to Hannigan, who is manager of technical operations for the mini maker.

This was helpful during periods when runners were finishing the race in large groups because up to five CRTs were being used to enter the data, he explained. The mini's multitasking capability permitted data to be typed in at the same time the results were being printed out, he added.

The Level 6/47 used here last week had 256K bytes of memory. The process also involved five VIP 7200 CRTs and a 900 line/min printer.

Data Storage

Finishing times, as well as information entered into the system before the start of the race, were stored on 280M-byte storage modules that included such data as the runner's height, weight, age, address, running club — if any — and estimated running time. The latter was used by officials primarily to assign the runner's number.

The Racer program was written partly in Cobol and partly in Assembly language, Hannigan said.

Although only one overall list of finish times was printed on site, individual rankings will be printed and mailed to each competitor, he noted.

Runners were divided into five groups: 17 years and under, 18 to 29 years, 30 to 39 years, 40 to 49 years and 50 years old and over.

Only One Hitch

The whole operation went very smoothly; the only hitch occurred when a city electrician turned the power off, thinking no one was using it anymore, Hannigan said. But by that time, the race was over and cleanup has begun. The system came up about five minutes later and the work was finished, he noted.

Honeywell has donated its equipment and programmer time to the Boston Marathon for the last four years and had also helped in air races and other running races across the U.S.

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ADAPSO
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Two CPUs Debuting at Info Permit Double Emulation

(Continued from Page 1)

processing and special instruction support, permitting microcode implementation of such functions as communication subsystems and file management systems.

The execution processors, like the auxiliary processors, are microprogrammable by the user; they are responsible for fetching, decoding and executing instructions.

Different types of execution processors can be intermixed within the same system — up to two for the smaller system and up to four for the larger one — allowing the system to simultaneously emulate two different mainframes, such as an IBM 370/138 and another system, the spokesman said.

One of many benefits of this approach is that it allows systems programmers and applications programmers to do their work at the same time, he added.

Storage on the VMX 200 ranges from 256K to 1.5M bytes, while the VMX 400 has a capacity of 500K to 8M bytes. Memory increments for both systems are sold in 256K-byte units.

Performance Comparisons

The memory, made up of 16K, dynamic NMOS chips, has a memory cycle time of 495 nsec and a machine cycle time of 175 nsec on both systems. This is said to allow the VMX 400 to execute a basic register-to-register (RR) instruction in .875 msec compared with a speed of 1.2 msec for IBM's 370/148, according to Nanodata.

The VMX 200 reportedly executes a register-index (RX) instruction in 1.5 msec, the model 400 in 1.09 msec and the 370/148 in 1.97 msec.

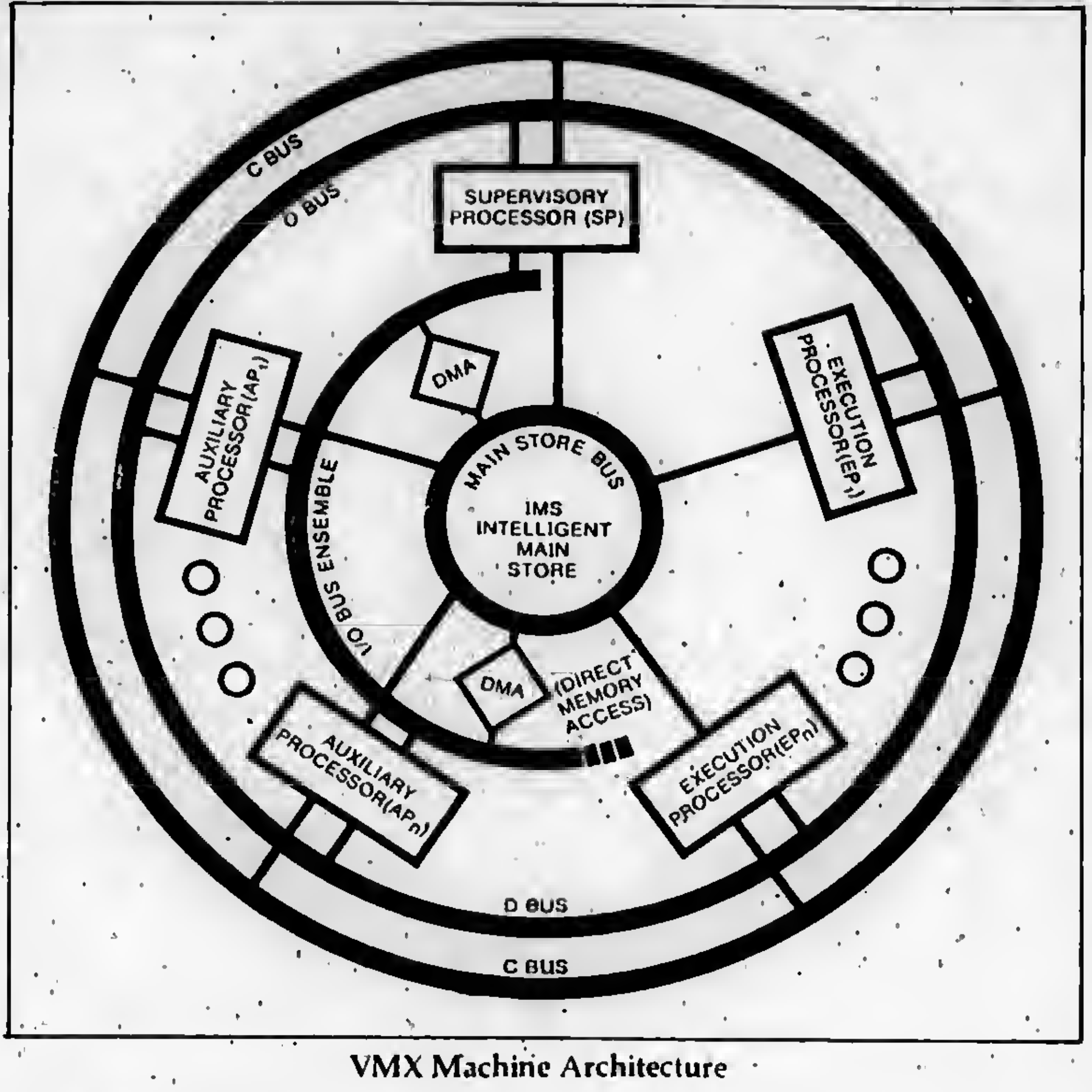
Channel implementation is provided by direct memory access (DMA) controllers acting as functional equivalents of either selector or block multiplexer channels. Each controller is capable of sustaining a maximum transfer rate of 7M byte/sec, while the system as a whole can transfer data at a maximum rate of 16M byte/sec, according to a spokesman.

A maximum of four byte-multiplexer and 10 high-speed (selector) channels can be configured on the VMX 400 in this manner, and a maximum of one byte-multiplexer and four selectot channels can be used on the smaller system.

Regional Offices Planned

Present marketing plans for the system call for establishing sales, system support and field engineering regional offices in New York, Chicago, Los Angeles, Dallas, Atlanta and Washington, D.C. Support will be provided by an as-yet-unnamed vendor.

As the number of installations increase, Nanodata will expand to 25 of the largest metropolitan areas in the U.S. and provide its own field support, it said. The company plans to emphasize sales over leasing, although a full payout lease plan (but not an operating lease plan) will be available.



VMX Machine Architecture

The systems will be offered with interfaces for standard minicomputer or IBM (including IBM-compatible) peripherals; alternatively, Nanodata will sell systems to users complete with minicomputer peripherals, the spokesman said.

Hedge Against Obsolesence

John T. Liebel Jr., chief executive officer of the eight-year-old Buffalo-based company, said the idea behind the systems was to provide users with a hedge against obsolescence caused by present or unforeseen developments in technology. "We can create future virtual systems over a long period of time and offer the user a system that can accommodate technology as it develops, and we can offer future products as extensions to the systems," he said.

The systems, which use TTL, ECL and Schottky design but do not incorporate CMOS chips, will not be limited to emulating only the IBM S/370, the spokesman emphasized. Users can work within the system's microcode to write emulators for other minicomputers, he noted, adding Nanodata itself will enter this market if there is sufficient customer demand.

Although current plans call for marketing both systems to end users "strictly as systems, complete with standard minicomputer peripherals," discussions are currently under way with manufacturers who seek to integrate the systems into their own offerings, Nanodata said.

Configurations, Prices

The company provided three examples to illustrate pricing on the system. An entry-level system consisting of a VMX 200 with 512K bytes of memory, a 300 line/min printer, 300 card/min reader, two high-speed data channels, tape and disk controller, two 40M-byte disk drives, one 60K-byte tape drive, diskette, CRT console/keyboard and diagnostic communications interface will sell for $185,000.

An intermediate system, suitable for batch work or time-sharing use, is obtained by substituting a 600 card/min reader and 600 line/min printer and 300M-byte disk drives and adding a 16-line communication controller. This system will cost approximately $265,000.

Useful for Time-Sharing

Expanding the intermediate system by substituting a 64-line communications controller, 1,200 line/min printer and two 120K-byte tape drives and adding an additional disk controller wlth two 300M-byte disk drives results in a system the company said is suitable for use as a large time-sharing system. The price tag on this system will be approximately $500,000.

The number of processors on each system is field-upgradable, and the VMX 200 is "probably" field-upgradable to the VMX 400, the spokesman said.

A Company To 'Emulate'

BUFFALO, N.Y. — Nanodata Corp. was formed in 1971 and, in its early days of operation, was engaged primarily in high-technology research and development activities. These R&D efforts culminated in the production of the general purpose computer system in 1974.

That system was "specifically designed to allow the user to emulate any computer," according to the company.

The emulators Nanodata has developed so far — in all branches of the military, major universities and Fortune 500 companies, according to the company — include those for the IBM 360, Digital Equipment Corp. PDP-11, Data General Corp. Nova and 23 others.

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IBM Witness Hits Memorex, Telex Accounting

NEW YORK — Both Memorex Corp. and Telex Corp. engaged in "inappropriate" accounting practices to make them look more profitable than they were in the 1960s and early 1970s, according to an IBM "expert" witness who took the stand last week in the U.S. vs. IBM antitrust trial here.

The testimony of Abraham J. Briloff, a professor of accountancy at the Bernard M. Baruch College of the City University of New York, was apparently sought by IBM in order to back up its contention that the problems of its plug-compatible peripherals competitors were self-induced rather than the result of monopolistic action by IBM.

Briloff discussed his investigations into what he called "misleading accounting practices" which he has "exposed" time after time in national publications over the last decade.

The professor said the source of many such actions was simply the time — the "go-go years" of the '60s. At that time, it appeared the "supposedly sophisticated financial community had lost its reason."

He said that such "glamour companies" as Litton Industries had completely captured the excitement of Wall Street and offered "dazzling potential and implications" for investors with "incredible" price/earnings ratios in the 80/100 range.

Although these companies' bottom lines presented "a blissful potential" to investors, they were derived through "gamesmanship" and not financial reality, Briloff testified.

He cited articles he published about Telex (1970) and Memorex (1972) that revealed the same conceptual framework for both companies. The Telex article, which appeared in Barron's on May 11, 1970, resulted in a $110 million law suit against Briloff and Barron's. Telex claimed the article single-handedly caused its stocks to drop by $55 million.

Briloff said the distortions in financial statements arose from pooling of interests accounting, which he referred to as "buying earnings." He gave a hypothetical example of a company that buys property shares for $100 million and accounts for it as if it cost $10 million. The company then sells the hares for $90 million, actually taking a loss of $10 million, but reporting a profit of $80 million.

Briloff, who has published many articles dealing with the same and similar acounting-oriented subjects, said his main concern is for more honesty, candor, and openness within the accounting profession. He testified last May on IBM's behalf in the Memorex vs. IBM antitrust trial and a month ago before the Senate Subcommittee on Antitrust and Monopoly.

And Then There Was One

NEW YORK — The IBM defense team dropped another witness from its list last week in the U.S. vs. IBM antitrust trial here.

The dropping of "expert" witness Thomas I. Unterberg, underwriter and partner in the firm of C.E. Unterberg, Towbin & Co., continues IBM's recent pattern of actions aimed at speeding up this trial now in its fourth year [CW, Oct. 2].

Although the action will undoubtedly help speed things up, it is not without its negative effects on the government's legal team. According to lead government attorney Robert Staal, Unterberg had been deposed by the government; therefore, his being dropped constitutes "additional wasted effort" on the government's part.

Staal said the government is now down to only one other deposed witness. "We're scrambling," he said about the government's effort to be prepared to cross-examine IBM witnesses each day in court.

The government lawyers will take several depositions in the next few weeks and hope to "get back in a good position" in that regard.

NBS Releases COM Standard

WASHINGTON, D.C. — The National Bureau of Standards (NBS) has issued "the first in a series" of standards for microimage output from computer output microfilm (COM) systems.

Federal Information Processing Standard (Fips) 54 establishes formats and reduction ratios for computer-generated 16 mm and 105 mm microforms.

The standard was developed by Federal Task Group TG-18, an interagency committee established to recommend COM standards.

Fips 54, Specifications for Computer Output Microform Formats and Reduction Ratios, 16 mm and 105 mm is available from the National Technical Information Service, U.S. Department of Commerce, Springfield, Va. 22161, at a cost of $4 in hard copy or $3 in microfiche form.

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The Longer Zip Code: Don't Panic, Plan Ahead

(Continued from Page 1)

financial reward, he commented.

In response to an obvious question, the spokesman added that the changeover to a nine-digit code will be the last such shift. There is no plan or serious thought being given to even longer codes, as some people have suggested.

Two Areas of Change

Given that admittedly sketchy framework, DPers see their work falling into two basic areas — changing programs and data files or changing data bases — with more changes in programs and external documents possible later, when the Postal Service specifies how the longer Zip Code should be shown in addresses.

The modification of programs will vary from installation to installation, although some general patterns may develop. The biggest single pattern of change obviously will be to get sorts adapted to key on a nine-digit field instead of the five now used.

Other changes appear to be limited to such things as the minor coding needed to link the five-digit Zip Code and the four-digit add-on if they cannot be stored as a single field.

The data storage changes will vary, largely dependent on whether the installation is using conventional files or structures under a data base management system. And how the file users attack their Zip-related problem will depend largely on how they have built the files until now.

For example, a file-oriented shop that has been very tight in its file layouts, with no filler space, is going to have to do more than the center that has been a little looser, leaving some space (at least several bytes for our current needs) for the changes that mark any viable and flexible system.

Even if no other changes are needed, the tight files will have to be redefined to allow space for the nine-digit Zip Code. This is one place where long-range planning may pay off.

Although four digits have to be added, they may in fact not take any more space than the current five-digit code. But to accomplish that minor miracle takes a byte-oriented machine, a current character-oriented representation of the five digits, a switchover to a packed presentation of the nine-digit code and the relatively minor coding needed to pack and unpack the digits when they are moved in and out of the machine.

Users already storing the "short" Zip Code in packed form will have to add two bytes to each record for the four extra digits, and users working — and staying — with character representation will have to add four bytes per record.

Users with the more open, FILLER-extended files can probably put the extra four digits in the unused space and patch coding into their programs to work with those digits, even without recompilation. This approach is error-prone, however, and likely to give nightmares to a DP auditor or any one else with a sensitive stomach, so even here recompilation is the recommended path.

The data base-oriented installations face the problem in much the same way as the users with the flexible files, except that recompilation of programs just to accommodate a file change — even if the change doesn't affect a given program — are not necessary. Data independence, the battle cry of the data base management system (DBMS) advocates, proves its value in this situation; only programs with logic changes will have to be regenerated.

But away from the programs, the data base administrator (DBA) — whatever his title — has to adapt the physical and logical data base structure so users who need to access the nine-digit Zip Code can do so.

In this task, the DBA must make the same choices of internal representation — packed or character — that the file manager faced, with the same considerations of space saved vs. pack/-unpack coding to be added.

It may be that the move to the longer Zip Code, a decision essentially outside the control of the DP manager or the DBA, seems a compelling argument in favor of DBMS. But that's too simplistic: a DBMS is useful, especially in a situation such as this, but careful planning with conventional files can be just as productive.

User Wins Suit Against GA

(Continued from Page 1)

Brown Publishing was forced to distribute the textbooks manually at an alleged loss of approximately $500,000.

"It was supposed to run up to 32 terminals concurrently," Brown said; "but once we put two terminals on the [system], it would crash."

The publishing firm claimed that although the system was billed as a "turnkey" computer, none of the hardware/software "pieces" seemed to fit. GA's technical staff allegedly tried to assemble, program and debug the system — all at the same time — for three months without success. "We were never in a position where we could test the machine from a business application standpoint," Brown observed.

The system's problems were finally traced to its operating system, although GA's engineers still didn't know how to fix it, Brown continued. "We'd never had a computer before, so we didn't know what an operating system was."

Brought in Consultant

Brown Publishing eventually hired an outside consultant to evaluate the inoperative minicomputer system. The consultant subsequently discovered that problems with the DM-140's operating system were common to nearly every one of the machine's installations. "That's when we shut the doors," Brown declared.

GA contends, however, that the problems surrounding the DM-140's operating system could have been solved if the firm had been given a little more time. "I think there's no question that we had a schedule we didn't meet," Irwin Kwatek, GA's general counsel, said. However, "I don't believe our software is inadequate; it could have been made to work."

In the "world of computers," three months is a reasonably short period of time, GA's counsel contended. "At the time [Brown Publishing] kicked us out, we were getting pretty close [to a solution] but...they, so to speak, got nervous and sued us."

GA, however, does not intend to appeal the court's decision, Kwatek said.

David Bauer, Brown Publishing's attorney, insisted that GA showed little sign of resolving the DM-140's problems and that eventually "it just came down to fighting."

In an unrelated instance, the Datapro Research Corp. of Delran, N.J., released a report on minicomputer systems last March which rated the DM-140's operating system as poor. In a survey of 14 users, representing 65 installed systems, the minicomputer's SPC-16-based software, on a scale of one to four, was rated 1.9 (weighted average).

Further, GA's technical support, on the same scale, was scored 1.8, prompting Datapro to comment, "Based on the responses from [the 16] users, it's clear GA has some homework to do."

GA, however, dismissed Datapro's survey and disputed the report's conclusions. "I believe we have about 2,000 SPC-16s out," GA's counsel stated, "so a survey of 16 users is not necessarily indicative of what happens."

GA believes the legal imbroglio with Brown Publishing, rather than being a defeat, was a victory of sorts. "We had tried to settle this lawsuit several times in the past with approximately the same amount that was awarded Brown Publishing," Kwatek stated. "Brown kept on saying it was going to go for fraud and look for millions of dollars and we believe the company didn't even cover the cost of taking us to trial.

"We feel very strongly that we've been vindicated...we never for any moment thought we were guilty of fraud," Kwatek asserted.

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WANG

On Military, Economic Grounds

Study Sees No Cause to Bar DP Exports to East

By Jake Kirchner
CW Staff

WASHINGTON, D.C. – There is no military, economic or political reason to deny exports of sophisticated DP equipment or technology to Eastern Bloc countries, according to a study released here by the Brookings Institution.

"When everything is taken into account," the study said; "the basis for special concern about the export of technology to the East, as contrasted with exports of the general range of goods and services, appears to be quite narrow."

Discussing military-related DP, the report quoted a Rand Corp. study that found Soviet computer capability to be adequate to it's military needs:

"To the extent that the best Soviet computer, the BESM-6, fell short of meeting needs, greater use of time, labor and other resources enabled the Russians to prdouce achievements comparable to those of the West's more computer-intensive defense policy," the 1974 Rand Corp. report was quoted as saying.

Furthermore, the Brookings report stated, the U.S. military seldom uses computers more sophisticated than those available to the Soviets. When it does, there is little evidence of substantial difference in capabilities from those the Soviets obtain or would desire, given their defense policies, the report added.

"In short," according to the study, "a sufficiently strict export control system might deny to the USSR least-cost solutions to military DP problems, but it probably could not prevent the Soviet military from achieving satisfactory solutions."

The report is the result of work sponsored by the Kiel Institute of World Economics and the Japan Economic Research Center along with Brookings. The study is entitled "Economic Relations Between East and West: Prospects and Problems."

No Ecomonic Boost

Addressing possible economic reasons for withholding technology from Eastern Bloc countries, the study asserted that imports do not allow Communist countries to significant increase economic growth or improve production.

"Soviet imports of machines have amounted to less than 2% of total machinery investment," the report noted. "Even if one assumes that the productivity of such imports is two or three times as great as the productivity of new domestic machinery, the effect on the rate of growth would only be marginal."

In addition, labor-intensive economies such as that of the Soviet Union are not greatly aided by increased automation, the report pointed out. Also, the rigidity of the Soviet centrally planned economy has "limited the updating and improvement of imported technology, which has been done, for example, in Japan."

Turning to the other side of the economic issue, the effect on exporting countries, the study said exporting technology to Eastern countries does not significantly reduce product markets there, because the world market is just too large.

In addition, to the extent that imported technology does increase exports from the East, the Eastern countries will be better able to pay for additional imports, the report noted.

"The effect will be to increase trade in both directions, and any loss of markets through Eastern competition is pat to be offset by the expenditure of increased export earnings in the West."

Effect on Bargaining Power

It "seems doubtful," the report continued, that withholding technology exports would increase the bargaining power of the West in noneconomic issues. This was seen as true for several reasons:

- "The technology in demand in the East is usually available from many nations and through a variety of channels"
- "The feasibility of gaining the cooperation of suppliers of technology, which are competing with each other, to organize an effective monopoly is low.",
- Such arrangements would run up against antitrust laws in many Western countries.

"Given the relatively modest gains accruing to the East, particularly the Soviet Union, from imported technology and its strong commitment to political objectives, it seems unlikely that significant concessions on noneconomic issues could be gained by using technology as a bargaining chip," the report said.

"At best, such an attempt, for most types of technology, would only delay, rather than deny, access," the study concluded.

In fact, if the West wished to exert "maximum economic and political pressure on Eastern countries, controls on the export of wheat and other grains offer the best prospects."

The study added that its conclusions concerning trade in technology with Eastern Europe are applicable to China as well.

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Library Users Get Fingertip Access to Sources

By a CW Staff Writer

ATHENS, Ga. — Library officials at the University of Georgia are nearing the end of a four-year system development project aimed at bringing information on several million books and documents to the fingertips of library users.

Called Managing Resources for University Libraries (Marvel), the system was designed in-house, according to John G. Christoffersson, because the library acquires new materials in so many ways that off-the-shelf types of library systems products can't handle it.

Christoffersson, assistant library director for systems and services, explained, "It's easy to write a system to trace an order for a book and then pay for it when it comes in. And many [vendors] coming in off the street can do this for you," but their aim is an integrated system that processes all books, periodicals and standing orders and also handles bill payment.

The library has "[5,000] standing orders with publishers for books in certain categories like computer science, for example." When a book is published in one of these series, it is automatically sent to the library" without any specific order form being sent out. "We often don't know when a book has been published or when it's going to come in," he said.

The library must also manage its 13,000 subscriptions to various publications.

In addition, "we belong to the Association of Research Libraries and don't know in advance what kind of materials we are going to be receiving from that group."

Finally, the library places orders with individual publishers for specific books, he said.

At the moment, library employees are putting the card catalog into a large data base. About a quarter of a million records have been entered to date, and ultimately, two million to three million records will be in the system, Christoffersson estimated.

The system is being operated on one of the university's IBM 370/158s. At the present time, according to Christoffersson, the library is using about 25% of the capacity of the 5M-byte 158 for the project and is the single largest time-sharing user of this system.

The library's 158 has CICS for on-line applications and Vsam for file maintenance, Christofferson said. Tcam is used for access and as a lower level teleprocessing monitor, and TSO is used for entering information into the data base.

At present, the system is only being used by the research staff and probably will not be ready for use by the public for six more months.

Requests Filled in Seconds

Working from computer terminals in the main library or science library, researchers can type in their requests for information and, within seconds, all pertinent information relating to the request will be transmitted from the 158 and displayed on the terminal's screen.

"Our on-line system will drastically reduce the need for a [physical] card catalog and may eventually replace it entirely," he said.

"Unlike a card catalog, where you must know the author and title in order to find a book, Marvel will honor requests even when only the author or part of the title is known," Christoffersson said.

The system will also tell the user if the material is available, where it is located, if it is on order and for how long it has been on order. If the material is not in the library's collection, the system will tell the user how an order may be requested directly from the terminal.

"It's not uncommon for publishers or wholesalers to take weeks and even months to supply library materials," Christoffersson pointed out. "This causes problems for researchers who may be waiting for books but won't know for some time if the material has arrived.

"We've taken care of this by entering into the computer the bibliographic information on material as soon as such information becomes available. This information is then updated regularly, providing the user with a current status report on each library item of interest." Periodicals, maps, phonograph records and other items as well as books can be entered into the com-

(Continued on Page 12)

Library users at the University of Georgia can use CRT terminals to obtain information on more than a million and a half items of library material.→

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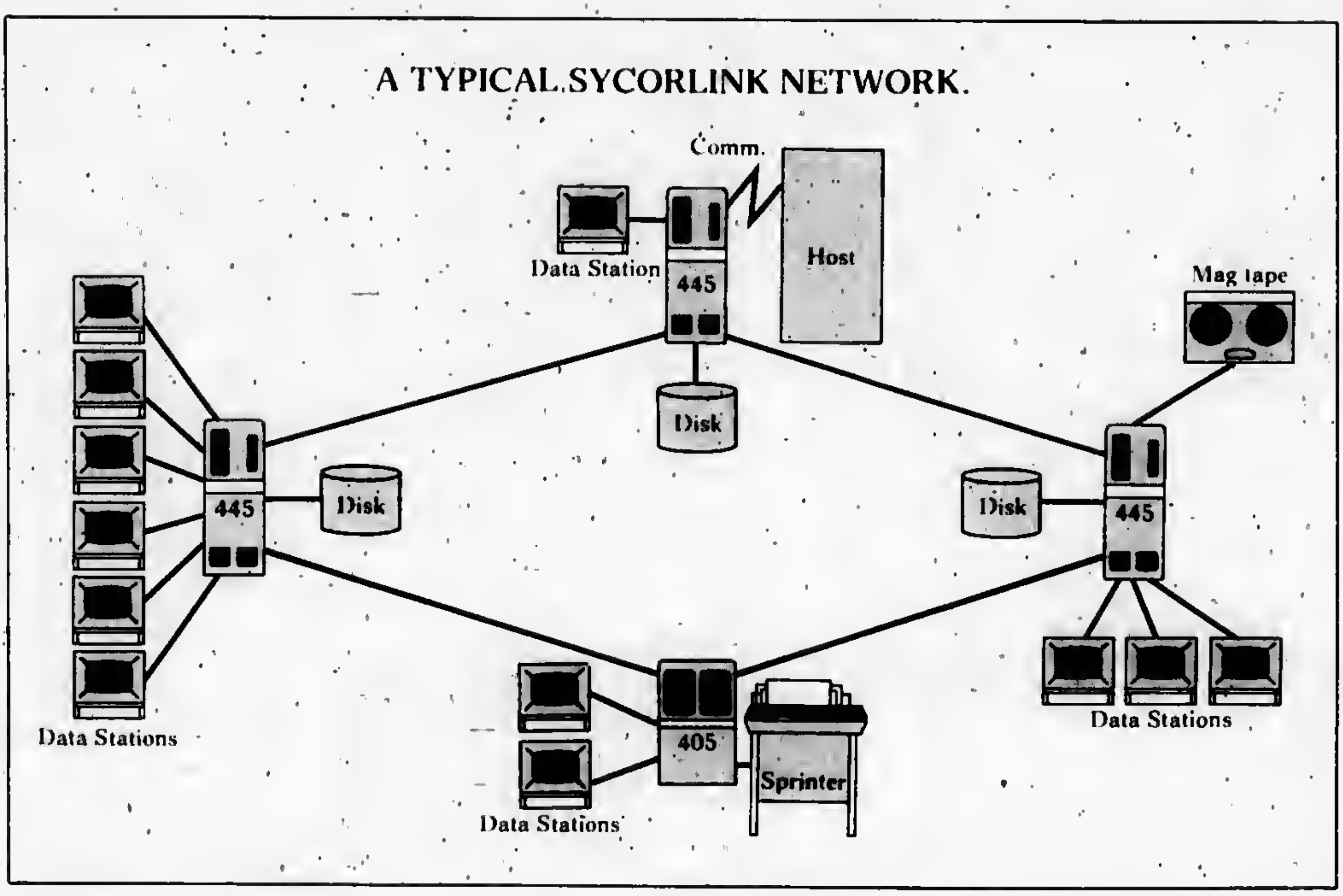

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As Result of Project Match

Fifteen D.C. Women Indicted for AFDC Fraud

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Fifteen women have been indicted here as a result of a federal computer project designed to detect welfare fraud.

In Project Match, initiated by the Department of Health, Education and Welfare (HEW), the computerized roles of the department's District of Columbia employees were matched against computerized files of women receiving money under the Aid to Families with Dependent Children (AFDC) program [CW, Nov. 21].

The AFDC lists were supplied by the District of Columbia government, overseer of the program which is 55% financed by the federal government.

The 15 women, 11 current and four former HEW employees, were indicted in U.S. District Court for the District of Columbia Sept. 27, according to an HEW spokesman. They were charged with mail fraud and false pretense.

Robert Wilson, spokesman for the HEW Inspector General's Office, said the indictments are the result of a pilot program of Project Match involving only the District of Columbia. The project is now being expanded to cover all 50 states, he said, and HEW expects "quite a number more [indictments] around the country."

Project Match is one of three programs begun recently by HEW that uses DP to detect fraud against the federal government.

In the District of Columbia pilot program, the D.C. Department of Human Resources supplied its AFDC lists to HEW. Wilson said HEW found 216 of its employees had received AFDC benefits. Those 216 were then reevaluated by the D.C. government for eligibility for such aid.

Wilson emphasized that "an elaborate system of controls" was used to mask the identity of those screened in the match until it was decided which cases should be referred to the U.S. attorney's office for possible legal action.

According to the HEW spokesman, the department uses two criteria for referring cases for legal action: the person must have received "apparently improperly" $2,000 or more in AFDC payments and the person must have income of at least $10,000 a year.

Using those criteria, Wilson said, eventually 20 names were sent to the U.S. attorney's office here. HEW estimated that 15 women received approximately $75,000 in fraudulent welfare payments, he said.

Estimated Savings

Project Match, which has cost the government about $1 million so far, will produce an estimated first-year savings of at least $12 million, Wilson said.

This figure is based on a $2,000 per case per year average, although the figure could be low because it does not include Medicaid benefits and food stamps that might also be received fraudulently, he said.

HEW will take no departmental action against the 11 current employees indicted unless they are found guilty. However, all 15 women have been denied further AFDC benefits, he added.

Two similar HEW projects have produced a flurry of legal action over the last year. Project Cross Check has so far this year prompted legal action against some 2,000 people found through computer matching to have defaulted on government-guaranteed student loans, according to Wilson.

Project Integrity, designed to detect possible Medicare and Medicaid fraud by screening billings to the programs by doctors and pharmacists against 26 norms or "parameters," has already resulted in 17 indictments and seven convictions, according to Wilson. An additional 590 cases are currently under "full investigation," which could lead to criminal charges, he added.

DPers Notified Of CCP Deadline

CHICAGO — Programmers can register until Nov. 1 for the Certificate in Computer Programming (CCP) examination, slated for Dec. 9.

That announcement was made last week by the Institute for Certification of Computer Professionals (ICCP).

The CCP examination for senior-level programmers covers a common core of knowledge and an area of specialization: business, scientific or systems, an ICCP spokeswoman said.

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One-Day Event in London

Meet to Explore Data Flow

LONDON — A one-day conference focusing on issues affecting data flow across international boundaries and the future of electronic information exchange will be held here Dec. 4.

The conference is being organized by the International Secretariat for Transborder Data Flow, an organization its founders say emerged from private-sector concerns over increasing restrictions on the flow of information across national boundaries.

Two organizations have been established by the secretariat — the Association of Data Base Producers (ADP) of Great Britain and the U.S. Information Industry Association (IIA).

About five specific concerns gave rise to the secretariat, according to Paul G. Zurkowski, president of IIA and secretary general of the secretariat.

One is the multiple and varied links in the chain through which electronic information is marketed.

A second concern is the extension of increasingly complex regulations governing each of these links.

Third is the emergence of externally developed information (bibliographic, econometric, financial and social data bases) as economic goods in international commerce.

Fourth is the identification by each link of such information traffic as a revenue source creating attendant competitive pressures.

And finally, the group is concerned about the total absence of any organized private-sector voice to address and alleviate constructions on the international information pipelines.

For more information about the one-day conference, contact Robert J. Millson, secretary, Association of Data Base Producers, c/o Learned Information, Besselsleigh Road, Abingdon, Oxford, QX13 6EF, England; or Paul G. Zurkowski, president, Information Industry Association, 4720 Montgomery Lane, Bethesda, Md. 20014.

MIT; City Get HEW Grant

CAMBRIDGE, Mass. — MIT and City of Cambridge officials have received a three-year, $318,000 grant from the U.S. Department of Health, Education and Welfare to design and install an experimental computer-based information and learning service for public use at the city's public library.

The completed prototype system will permit easy access to a wide range of basic information, MIT said, including details on delivery of municipal and private human services.

Using a terminal which has no keyboard and requires no typing, the prototype system will permit easy interaction by the user, MIT noted. Users will be able to ask questions of the system, which will reply on a CRT screen.

In addition, it will be possible for a user to read through large amounts of material and select specific information to be printed, according to MIT, which added that terminals can be set up in different neighborhoods of the city.

The user-oriented service center will also provide learning programs for reading and writing basic English and for practicing mathematical skills.

The grant proposal will be carried out by the MIT Division for Study and Research in Education, in cooperation with the Cambridge Public Library and the Cambridge Office of Community Development.

Library System Eases Access

(Continued from Page 10)

puter, he said.

Unlike manual systems which can require as many as 40 duplicate cards scattered through some 20 different files, the Georgia library system uses only one specially coded record for each item placed in the computer. The entire record, or selected portions, may be retrieved, depending on the user's request (24 different screen displays are available), from any terminal in the system.

By eliminating cards, the system will also help reduce the amount of paper used in operating the libraries. The libraries now file some 3,000 cards in their catalogs every working day.

According to Christoffersson, "A user may find an item displayed that should be changed. Instead of copying the text on a piece of paper that's sent through the mail, the user enters into the terminal any comments, plus the recipient's name or department. When the terminal is checked for messages, the display and the user's comments will appear for the addressee.

"Of course, we'll still use paper to communicate with an outside source, such as a faculty member, a student or anyone who does not have access to a terminal; and to a vendor or supplier, who needs a written purchase order," he said.

About 60 IBM 3278 CRT terminals are expected to be installed in the libraries on the University of Georgia campus. The system will also be available to other institutions within the University of Georgia system by means of locally installed terminals connected by telephone lines to the university's central IBM computer in Athens.

About $1 million has been spent on the project to date, Christoffersson said.

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Proposal to Go Before CAB

Reservation System May Aid Travel Agents

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. – After years of experimentation and discussion, U.S. airline and travel agent representatives have agreed on an organizational framework designed to promote fuller automation of travel agency work.

A proposal will soon be before the Civil Aeronautics Board (CAB) to form an entity to be known as Multiple-Access Agent Reservations System, Inc. (Maars, Inc.), which would promote and coordinate travel agency automation.

At a meeting here Oct. 6, representatives of 12 U.S. airlines, the American Express Co. and the American Society of Travel Agents (Asta) culminated a two-year travel agent/air carrier automation project by agreeing to ask for CAB approval of Maars, Inc.

Bylaws of Maars, Inc., drawn up by representatives of the 14 organizations taking part in the automation project, provide for a not-for-profit corporation, whose functions would include contracting and interfacing between and among hardware and software vendors, communications vendors, airlines, trvel agents and other end users of automated reservation systems.

CAB consideration of the proposal could take "from two months to two years," according to Bernard Diederich, CAB attorney, who was an observer at the Oct. 6 meeting.

'Beginning of New Era'

The proposal, which Asta President James A. Miller termed "the beginning of a new era," is the result of attempts by Asta started in the early 1970s to find a system that would allow travel agents to access many airlines' seat reservation systems using a single system.

In 1976 the CAB gave the 12 airlines – 11 national and one regional – antitrust immunity to discuss with Asta and American Express the feasibility of developing a multiple-access reservation system.

Asta represents more than 50% of the approximately 13,500 U.S. travel agents, according to an Asta spokesman, and more than 70% of all travel agency billings. American Express operates its own group of travel agencies.

A.J. Foster, Asta's director of automation systems and operations, said his organization invited all U.S. Air carriers to participate in the project with the association and American Express. The 12 that accepted include some of the largest in the country, such as American Airlines, Delta Air Lines, Inc., Eastern Air Lines, Inc., Pan American World Airways, Trans World Airlines, Inc. and United Airlines.

The 14 participants each contributed $25,000 for a total project budget of $350,000 and chose three systems vendors for separate five-month pilot projects in three cities: Vidicom Ltd. in New York City, Tymshare, Inc. in Chicago and Honeywell, Inc. in Seattle.

The last of the pilot projects ended in late August, and according to Foster, the three systems were well received by participating travel agencies. "Overall, we're very satisfied with the results," he said. "The pilot project has proved the feasibility of the [multiple-access] system."

Access Via One CRT

Essentially, Asta wanted to develop a system that would allow agents to access many airlines using a single CRT terminal, Foster said. He predicted that eventually every travel agency will have to automate in order to remain competitive and stay in business.

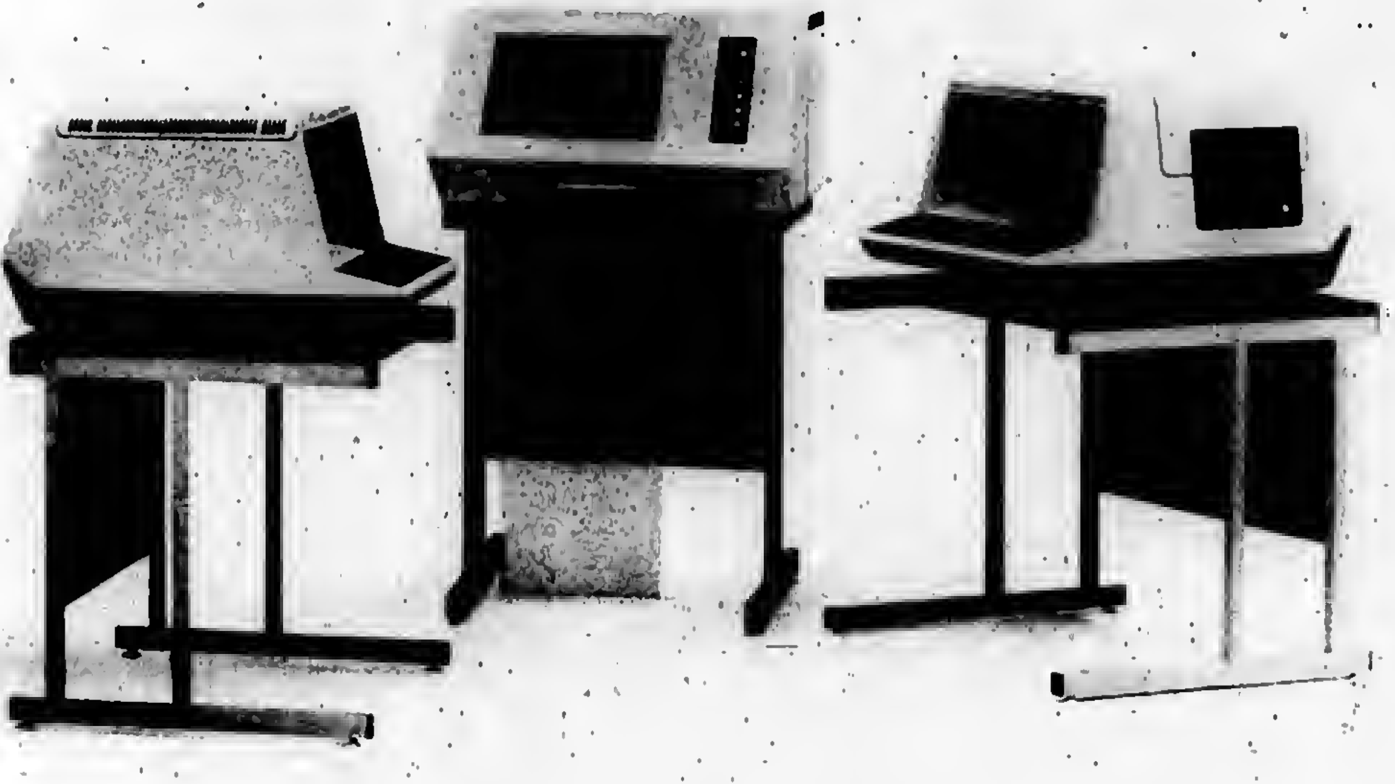
Although travel agency automation systems are currently available from hardware vendors and several airlines, including American Airlines and United Airlines, many travel agencies have found these systems too expensive or difficult to obtain, according to one project participant.

Many travel agencies that have automated have had to lease individual terminals for each airline and car rental firm an agent wishes to access, according to a Honeywell representative at the Oct. 6 meeting.

Bill Boone, manager of business development, minicomputer marketing operations, for Honeywell, estimated that an average-size travel agency, using four CRTs and one printer, would currently pay about $725/mo in

(Continued on Page 14)

made a great deal better



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ICN Seminar to Focus On Third-Party Leases

WINTER PARK, Fla. — International Computer Negotiations, Inc. (ICN) will sponsor a three-day seminar on third-party lease negotiations Jan. 22-24.

Instructors for the course are Joseph Auer, president of ICN and an internationally known consultant on computer contract negotiations; Kenneth C. Brindle, vice-president of ICN and a frequent lecturer on computer negotiations; and Richard M. Contino, practicing attorney, business consultant and author of the soon-to-be-published book *Legal and Financial Aspects of Equipment Leasing Transaction.*

The course will include a detailed review of the potential problems that can arise in third-party contracting as well as instruction on how to optimize the financial aspects of a third-party leased-equipment acquisition.

Other topics will include creating the proper balance between price and protection; negotiating in leasing situations; leasing considerations, including types of leases and sources of funding; and drafting and analyzing a lease document.

The course will also cover investment tax credit, depreciation advantages and the advantages and risks of leveraged leasing decisions, according to ICN.

Registration for the seminar, which will be held at the Langford Resort Hotel in Winter Park, Fla. is $595. Further information is available from ICN at 1331 Palmetto Ave., Winter Park, Fla. 32789.

Organization Would Aid Travel Agency Automation

(Continued from Page 13)

equipment rental and about $300 in monthly communications connection costs.

Foster agreed with that estimate and predicted that systems approved by Maars, Inc. would probably be offered at basically the same price. Such systems, he said, might initially offer air carrier reservation services, ticket printing and value-added services such as accounting.

Honeywell System

For example, the system Honeywell used in its part of the pilot project included one Level 6 minicomputer with 64K bytes of main memory and 10 million bytes of disk storage, 15 VIP 7700R terminals and six printers, two for each of the three Seattle agencies Honeywell served.

In addition, Honeywell developed a Maars software product written in Assembly. The software will be offered on a licensed basis, the company said.

Besides performing standard reservation functions, the Honeywell system can be enhanced to provide back-office accounting functions and to accommodate "city pairs" — special listings of airlines with connecting flights in each city, the company said.

Honeywell, already "aggressively marketing" its system, according to Boone, is one of several companies now offering Maars packages. It is not clear what effect, if any, Maars, Inc. will have on those systems now available.

The Maars, Inc. proposal, to be submitted to the CAB within the next few weeks, describes the organization as being responsible for providing minimum standards for hardware and software vendors; establishing an interface protocol for communications vendors; and coordinating air carrier schedules, communications connections and DP systems.

The proposed corporation would not have legal regulatory authority and would operate only in an advisory capacity except when it might undertake contractual obligations, such as the provision of airline schedule information to the communications and hardware vendors who would in turn supply the information and their added services to travel agents and other end users.

Hardware and software vendors would do their own marketing and provide installation and maintenance and user training, according to the proposal.

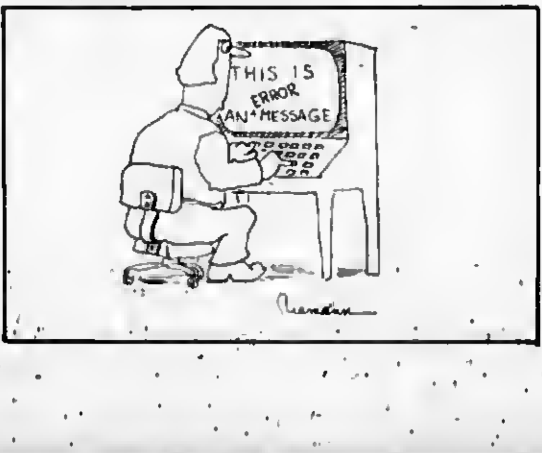
In addition, International Telephone and Telegraph (ITT) has announced the formation of a wholly owned subsidiary, ITT Electronic Travel Services, to offer communications services to the travel industry. According to an ITT spokesman at the Oct. 6 meeting, ITT plans to work closely with Maars, Inc. but will begin operations during the time the CAB is considering the Maars, Inc. proposal.

The proposal provides that the corporation will have as members one representative from each of the 14 original project participants. Other parties to various reservation systems, such as other airlines, would be allowed to join as "associate members."

The proposed bylaws state "it is contemplated that foreign air carriers will become associate members" provided they reciprocate in providing information on their schedules and services. Associate membership will not be based on arbitrary or discriminatory considerations, the bylaws add.

The CAB could make a decision on whether to approve the formation of Maars, Inc. in as little as two months, the CAB's Diederich said. He noted that the board has followed the project for its two-year span and "is ready to process this matter."

However, he said, if the CAB decides full evidentiary proceedings are required, the matter could take as long as two years.



For Water Supply Forecasts

System Processes Data on Mountain Snow

By Marguerite Zientara
CW Staff

PORTLAND, Ore.—A computer system has been coupled with the "largest data acquisition system in the world" by a unique telecommunications setup in order to provide up-to-date information on snow cover in the Rocky, Sierra Nevada and Cascade mountains.

The information on the snow buildup in these mountains, which varies from 40 to 100 feet, is important, the system's developers said, because the mountain snowpack accumulated during winter and spring provides more than 70% of the western states' water supply during the year.

Weather researchers need information on the buildup in order to be able to predict the timing of streamflows and their volumes as the snow accumulation melts.

Accurate information will provide the farmer with more accurate projections of water supplies for the season ahead and reservoir operators, irrigation districts and flood control agencies will be alerted to the time of expected high and low flows in the streams in their areas.

Previously it was nearly impossible, researchers said, to obtain up-to-date information on the snow accumulation because many of these mountain sites were only accessible by helicopter or snowmobiles during the winter and the rugged terrain made it extremely expensive to install relay stations for normal communications in the area.

For example, in the past, snow surveyors have traveled more than 10,000 miles a year by oversnow machines, skis or snowshoes in order to bring back the snow survey information used in computing water supply forecasts, the researchers said.

But the new remote stations — which are microprocessor controlled — and the "meteor burst" telecommunications system allow researchers to obtain data from more than 160 mountain sites on a regular basis, the researchers added.

The system, called Snotel ("snow telemetry"), which has been installed since the summer of 1977, was recently approved by the U.S. Soil Conservation Service (SCS) and is now available to all users in the western U.S., according to Paul Zoerb, project manager for Snotel at Systems Consultants, Inc. (SCI) of Emeryville, Calif.

SCI designed the applications software and communications interface for the project's computer system and also acts as technical monitor of the overall system.

Remote Sensing Stations

The system consists of 160 remote sensing stations, each presently configured with four sensors. The sensors measure the voltage of the solar battery that powers the remote station, the weight of the snow on the ground, number of inches of fallen precipitation and air temperature. Each station is based on an Intel Corp. 8080 microprocessor.

The solar-powered batteries at each remote site provide power for a small solid-state radio receiver and transmitter. Data can be read as often as every 15 minutes and held until it is requested by one of two master collection stations located in Boise, Idaho, and Ogden, Utah. Data transmission is immediate upon command with no equipment warmup required, according to SCI.

But since normal communications methods are not available to such remote locations, the developers turned to meteor-burst technology for transmissions from the remote stations to the computerized collection stations.

Each day billions of small meteorites — about the size of sand particles — enter the earth's atmosphere, leaving behind a trail of ionized gases.

These ionized trails exist for only a few seconds, but that is enough to reflect VHF radio signals from ground points up to 1,200 miles apart, the researchers said.

Radio signals are bounced off these vapor trails to the remote stations from the central sites and the information is automatically transmitted back along the same trail, they added.

Each of the two master stations can command any remote site or group of sites, Zoerb said. When data is received at one of the central stations, it is temporarily stored in a Data General Corp. Nova 3 minicomputer, with 16K words of memory, for later transmission to the SCS Water Supply Forecasting headquarters here.

At headquarters, the data is identified, checked for validity and stored for later retrieval. The Portland headquarters serves as the central information exchange and also offers larger storage and retrieval capabilities than are possible with the small computers at the central stations, Zoerb said.

The Portland CPU is a Hewlett-Packard Co. 9640A configured with two HP 7920 tape drives a 200 line/-min Model 9866 thermal printer and a Model 12920B multiplexer, for interfacing with data communications circuits, Zoerb said.

Two HP 2640A CRT terminals in Portland, one on-line in the computer

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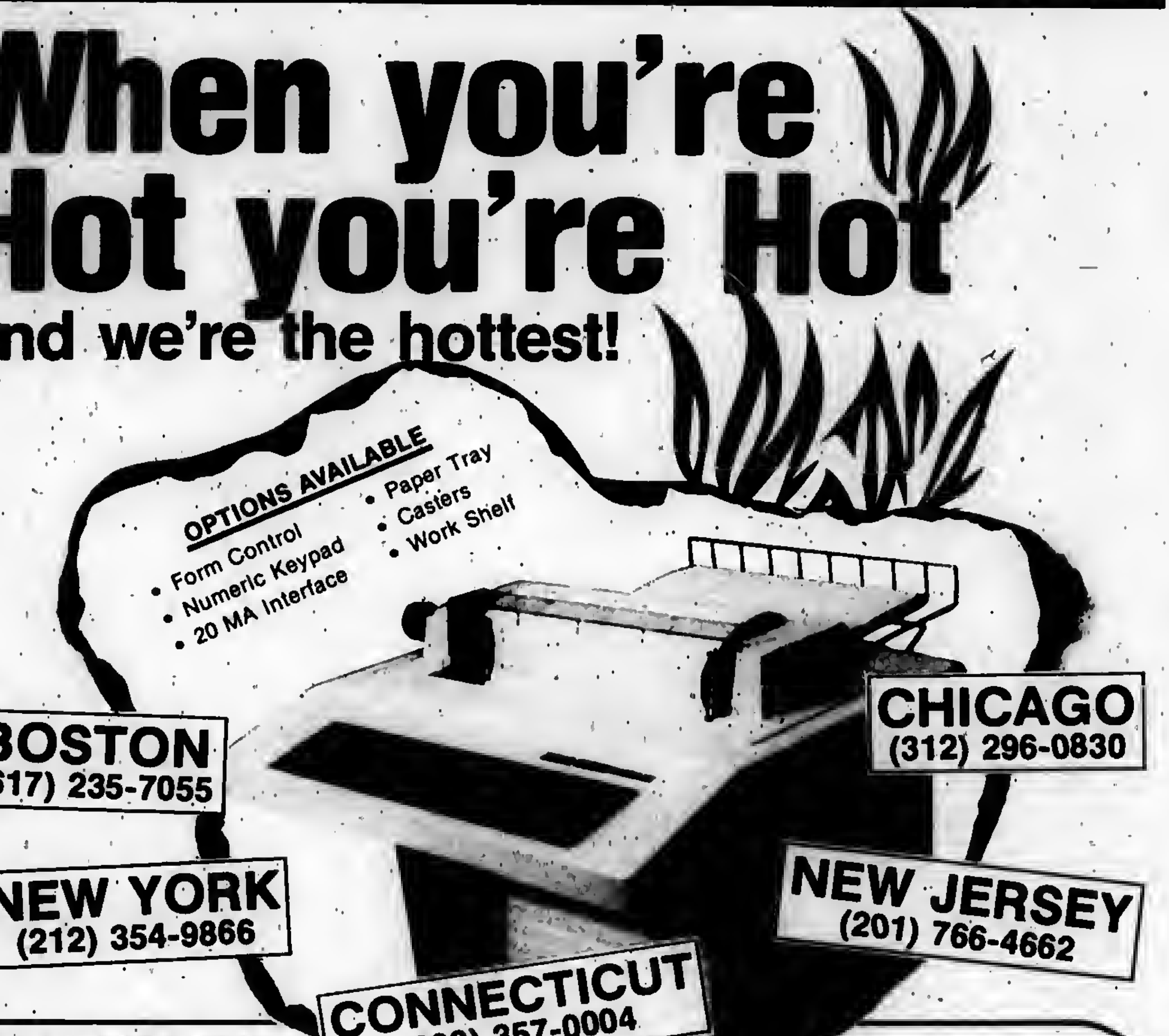

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ST. LOUIS — Edward Yourdon, president of Yourdon, Inc., Larry Welke, founder and president of International Computer Programs, Inc., and Jack Buck, nationally known radio and television personality and sportscaster, will be featured speakers at Datacon '78 here in December.

Sponsored jointly by the Data Processing Management Association (DPMA) and the Association for Systems Management (ASM), the confab is scheduled for Dec. 7-8.

Yourdon will be Thursday's keynote speaker and Welke will speak on Friday.

The "Voice of the Cardinals," Jack Buck, will speak at Thursday's banquet.

For additional information, contact Hardie Wilson, ASM/DPMA, P.O. Box 1401, St. Louis, Mo. 63188.

Goldwater Urges Conference On International Data Flow

WASHINGTON, D.C. — "The issue of transborder data flow communications is not some exotic, ethereal subject," Rep. Barry Goldwater (R-Calif.) told the House of Representatives recently on introducing a resolution calling on the President to convene a multinational conference on the subject.

The time has come for the U.S. to take a more active role in studying the issues of transborder data flows, he said, asking Congress to appropriate $3 million for his proposed International Conference on Communication and Information.

The conference, which would be held before Jan. 1, 1980, would include delegations from "the principal industrialized nations," Goldwater said, and would be conducted under the sponsorhip of the Department of State.

"The objective is to discuss all significant aspects of international telecommunications and transborder data flows and to have the Department of State submit recommendations to Congress for legislation or for an international convention," Goldwater told his fellow legislators on introducing the resolution.

Most of the other industrialized nations of the world are already devoting "direct governmental attention" to the subjects that would be covered by the conference, Goldwater said, adding that this attention is "serious and dedicated.

"It certainly is not transient. For example, the Council of Europe has moved from the phase of intellectual consideration and abstract discussion and study to asking for a draft multinational European agreement."

However, lack of a firm U.S. policy in the area has been "greeted by some with silent, polite embarrassment and by others as a golden opportunity to trim the sails of U.S. industry and competitive dominance," he said.

'Suffers by Comparison'

"For understandable, but unfortunate reasons, the U.S. suffers by comparison to the interest and actions of other nations," and while interest and attention to the subject is growing here, Goldwater said "many of our key policymakers have the mistaken belief that we have three or four years before we must confront this issue.

"As a result, the best that can be said of our activities, and I candidly include myself in this statement, is that we are discussing the matter in little more than tearoom fashion."

To date, the Department of State has developed a joint government/private-sector discussion group on the subject, he noted, and the issue is receiving "consistent, but understaffed and underfinanced attention" by the Organization for Economic Cooperation and Development.

Furthermore, the Department of Commerce's National Telecommunications and Information Administration has been devoting an increasing amount of manpower, talent and attention to the area, he added.

"However, all of this is occurring without any meaningful offical Administration support, without any clear congressional mandate or support and without any agreed-upon goals," he charged.

"The time has come to correct the situation and give direct support, focus and encouragement to these emerging activies," Goldwater said.

Transborder data flow issues are "directly related to such substantive matters as openness of communications, free flow of information, national security, protection and enhancement of personal informational privacy, international trade and economic cooperation and, perhaps, the continued ability of the free world to get along and not be divided and conquered," he stated.

Snow Data Gathered

(Continued from Page 15)

center and the other dial-up, are used as control consoles for the computer and for the transmission system, he explained.

Zoerb said the Portland system initially had a very small HP 7900 disk, with 2.5M bytes of memory, to which was added a 15M-byte HP 7905 disk. Both are concurrently on-line to the system, which Zoerb said is "unusual" on an HP system. Because Snotel needed a backup system, and the original disk was too small, the larger disk became the primary one and the smaller one backup, he explained.

The Portland headquarters is connected to the two master stations by means of 1,200 bit/sec full-duplex leased telephone lines, he said. In addition to initiating probes and receiving data, the circuits are used for assigning or reassigning remote stations to one or both master stations for polling responsibility, updating the master station clocks and transferring master polling responsibility in the event of a master station failure.

There are currently nine HP 2640 CRTs accessing the system, in nine of the 10 participating states, Zoerb said. New Mexico has no terminal, but has a cooperative agreement with the state of Colorado, which does have one. Other states with terminals in the Snotel network are Arizona, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming.

Since the Snotel system is basically for the acquisition of data to be used for a finite period of time, there is not enough room for all the data to be kept at the Portland installation. It is therefore stored on the Department of Agriculture's Univac 1140 at Fort Collins, Colo., for "historic reasons," according to Zoerb.

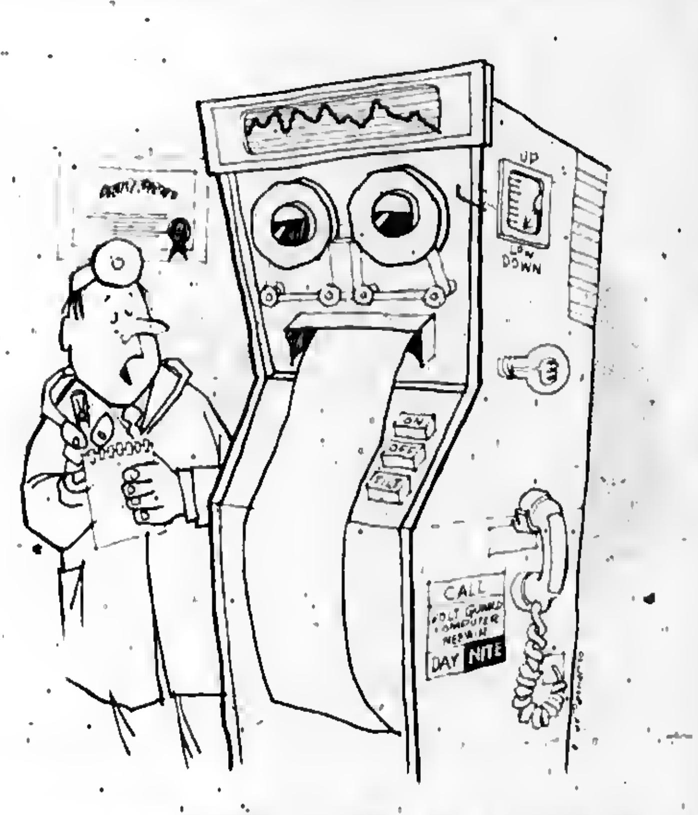
Fort Collins is linked with Portland via dial-up lines, operating synchronously at 2,000 bit/sec. Besides the Portland system, users can access Fort Collins' large data base through their terminals for forecasting programs, regression analysis and correlation analysis, Zoerb said.

Secode Electronics of Dallas manufactured the sensing equipment for the system, and Meteor Communications Consultants of Seattle did the systems engineering and design, according to Zoerb.

Western Union designed and implemented the telemetry system.

A total of 511 remote sensing stations are scheduled for installation by 1981, Zoerb said.

In the future, humidity, wind speed and direction and other environmental data may be added to the information relayed from the noted sites.



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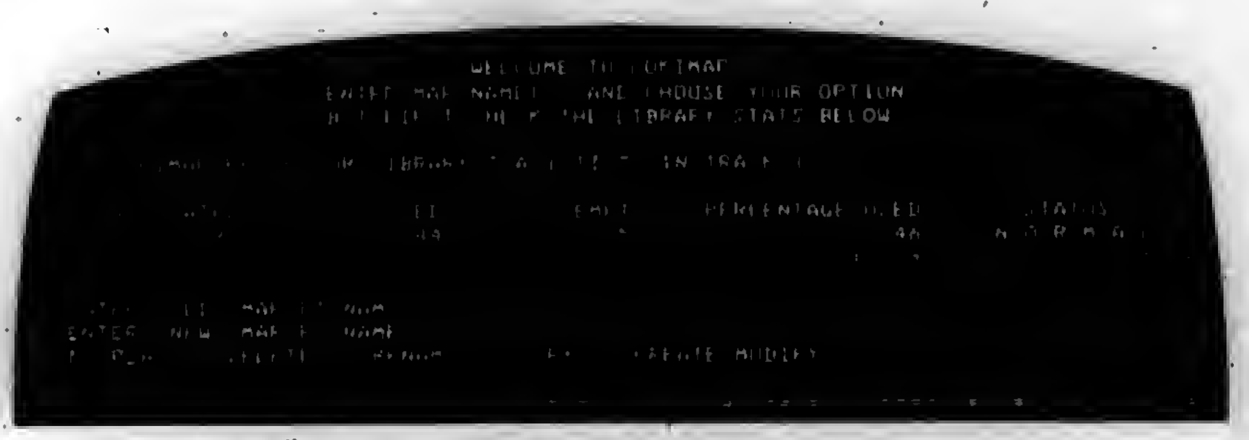

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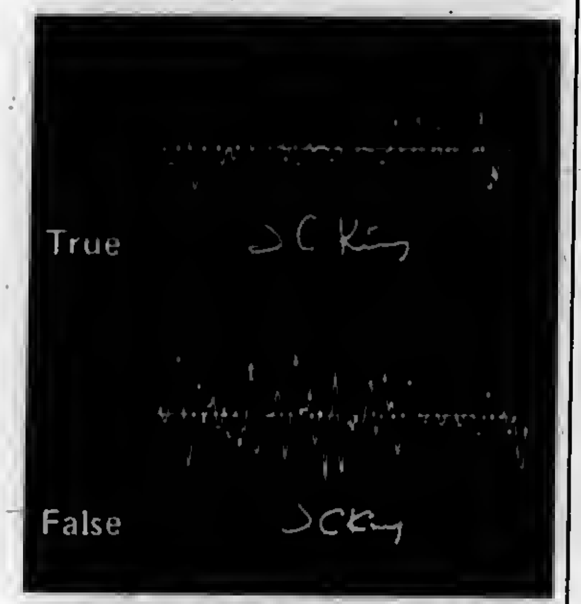
Experimental System Picks Out Forgeries

YORKTOWN HEIGHTS, N.Y. — An experimental computer-based security system that distinguishes between forged and genuine document signatures has been invented at IBM's Research Division here.

There are no plans to market the "automatic signature verification system" (ASVS), but IBM researchers believe it may be used someday by commercial and governmental organizations in controlling access to sensitive data, devices or locations.

Field trials conducted at an IBM facility indicate the ASVS is the most accurate device of its kind and far more accurate than human document examiners, according to Dr. Noel M. Herbst, one of the system's investors.

Staff members of IBM's Thomas J. Watson Research Center reportedly did their best to fool the equipment during the trials.



Although these signatures are a close visual match, the patterns of acceleration and pressure exerted by the pen as recorded by the signature verification system while the two signatures were being written are quite different.

According to IBM, the ASVS caught 99.6% of the staffers in the act of forgery (490 out of 492) and accepted 98.3% of the genuine signatures submitted to it (2,907 out of 2,958).

The ASVS does not simulate "reading" of signatures; instead, the system studies pen activity as the document is signed, recording changes in speed, direction and pressure. This information is compared with reference measurements made earlier and stored on an IBM 370.

The pen used in making the signatures is linked to the computer system and contains small accelerometers and a pressure detector that generate the input data.

'Revealing Hesitations'

"Revealing hesitations" and other differences in terms of acceleration and pressure between the input and reference data betray the forger, an IBM spokesman explained.

The special pen is linked in series with an "interface box" that delivers digital data to an IBM System/7, which in turn front ends the 370.

The interface box contains an 8-bit analog-to-digital converter and multiplexer and features three channels of amplification, the spokesman said. The mainframe reportedly stores the ASVS "decision algorithm": about 2,500 lines of PL/I code.

Studies have shown that rapid handwriting of familiar patterns, such as one's signature, becomes habitual to the extent that the timings of the muscular movements are consistent and beyond deliberate control, Herbst said. The virtually ingrained nature of such muscular coordination is the key to verification in the experimental system.

"The [field trial] results have been so encouraging that a great deal of interest has been voiced in developing [the ASVS] still further and putting it into practical application," Herbst noted.

"Possible examples could be control.

(Continued on Page 18)

An experimental system developed by IBM scientists has detected the difference between forged and genuine signatures in field trials. In those tests, 98.3% of the good signatures were accepted, while 99.6% of the forgeries were rejected.

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The first book, *Structured Programming for the COBOL Programmer*, presents a complete system for developing COBOL programs. It includes top-down design, structured module documentation, structured coding, and top-down testing. To use Paul's methods, you won't have to learn a new vocabulary and you won't be overwhelmed by theory. On the contrary, I think you'll be delighted by the straightforward simplicity of Paul's methods.

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Calendar

Oct. 24-25, New York — **The Next Five Years in Automated Systems Integration**, sponsored by The Yankee Group. Contact: The Yankee Group, Harvard Square, P.O. Box 43, Cambridge, Mass. 02138.

Oct. 30, Chicago — **Advanced Systems, Inc.'s 10th Anniversary Professional Training Conference — The State of Personal Privacy in America.** Contact: Advanced Systems, Inc., 1601 Tonne Road, Elk Grove Village, Ill. 60007.

Nov. 6-10, New York — **Structured Systems Analysis and Design**, sponsored by American Management Assocations (AMA). Contact: AMA, 135 W. 50th St., New York, N.Y. 10020.

Nov. 13-17, New York — **Managing and Controling Administrative Operations**; sponsored by American Management Associatons (AMA). Contact: AMA, 135 W. 50th St., New York, N.Y. 10020.

Nov. 16-17, San Diego — **Computer-Aided Design vs. Specified Energy Standards**. Contact: Automated Procedures for Engineering Consultants, Inc., Suite M-15, Grant-Deneau Tower, Dayton, Ohio 45402.

Nov. 20-21, New York — **Minicomputers and Small Business Computers: Selection and Usage Guidelines,** sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 27-29, Brussels, Belgium — **European Communities Symposium on Computer-Aided Design of Digital Electronic Circuits and Systems** sponsored by the Commission of the European Communities. Contact: Keness Belgium Congress S.A., Rue de l'Industrie, 17, 1040 Brussels, Belgium.

Nov. 27-30, Chicago — **Forms Design Course,** sponsored by American Management Associations (AMA). Contact: AMA, 135 W. 50th St., New York, N.Y. 10020.

Nov. 28-30, New York — **Information Technology and the Office,** sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Toronto — **1978 Canadian Computer Show and Conference,** sponsored by the Canadian Information Processing Society (Cips). Contact: Canadian Computer Show, Reg Leckie, show manager, Industrial and Trade Shows of Canada, 36 Butterick Road, Toronto M8W 3Z8, Canada.

Nov. 28-30, New York — **International Conference on Data Regulation — European and Third World Realities.** sponsored by Online Conferences Ltd. Contact: The Wayne Smith Co., Suite 810, 500 12th St. S.W., Washington, D.C. 20024.

Nov. 29-Dec. 1, San Francisco — **Data Base Management Systems: General Concepts and Planning Guidelines,** sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 29-30, Wellesley, Mass. — **Introduction to Data Communications,** sponsored by QED Information Sciences, Inc. Contact: Edpep Coordinator, QED Information Sciences, Inc., 141 Linden St., Wellesley, Mass. 02181.

System Catches Fake Signatures

(Continued from Page 17)

of access to credit or medical information, secure areas, Social Security records and the automatic teller machines at banks," he said.

In an earlier version of the system, patented in 1976 by Herbst and colleague John H. Morrissey, only acceleration data was measured as the signature was written, an IBM spokesman added.

To improve this version, Herbst and two other IBM scientists — Dr. Chao N. Liu and Nicos J. Anthony — added pressure-recording features and refined the decision algorithm by which the signature is evaluated, he said.

The decision algorithm is considered the heart of the ASVS and took more than four years to develop, he continued. This algorithm reportedly compares two signature patterns, while ignoring the gross changes common in signatures, such as missing strokes and stylistic variations.

The field trials involved 248 programmer participants who used the equipment during a five-month period.

Each participant was allowed three attempts to obtain acceptance of a signature. This resulted in the 1.7% rejection of true signatures and .4% acceptances of deliberate forgeries, the spokesman said.

However, the participants were later allowed to make four more attempts, resulting in a 1.2% rejection of true signatures (35 out of 2,881) and no further acceptance of forgeries.

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Three Workshops Set for Fall

Courses to Cover DP-Related Law Enforcement

SAN JOSE, Calif. — A number of seminars and workshops geared to "real world" criminal justice training needs and DP-related law enforcement techniques will be held from Oct. through Dec. by Theorem Institute, a nonprofit corporation based here.

The first, entitled "Privacy and Security," is an introductory course for criminal justice management and record personnel who must structure criminal records and computerized files according to recent Law Enforcement Assistance Administration (Leaa) regulations. The two-day session is scheduled for Nov. 13-14 in New Orleans and costs $175 per participant.

"Planning a Productivity System," a three-day seminar to be held in Washington, D.C., Nov. 28-Dec. 1, will focus on effectiveness and efficiency within modern law enforcement agencies. The registration fee is $225.

A three-day seminar on "Computer Planning" will be hosted in Phoenix. The course will center on computer implementation and operation; it is designed for the personnel of small and medium-sized law enforcement agencies. The seminar's cost is $225 per person.

Finally, Theorem will sponsor a three-day course Nov. 8-10 dealing with the evaluation of new ideas, management changes and the concept of planned change. "Strategies for Change" will take place on the same days in St. Petersburg, Fla., and will cost $225 for each attendee.

Additional information on the courses can be obtained from the institute's president, Michael O'Neill, at Suite 590, 1737 N. First St., San Jose, Calif. 95112.

Intel President to Receive IEEE Award at Compsac '78

SILVER SPRING, Md. — The IEEE Computer Society has selected Dr. Gordon E. Moore, president of Intel Corp., as this year's recipient of the W. Wallace McDowell Award.

The award is presented annually by the society to an individual who has made an outstanding contribution to the computer field in theory, design, practice or education.

Moore, together with Dr. Robert Noyce, founded Intel in 1968. Since that time he has pioneered developments in MOS memory and microprocessors.

The award will be presented to Moore next month at the society's second international Computer Software and Applications Conference (Compsac '78). The conference will be held in Chicago Nov. 14-16 and will cover software development and management; information management systems; computerized decision-making systems; and social, legal and regulatory issues.

Information on the award and the upcoming conference is available from the IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

'Capital Budgets' Seminar Topic

TROY, Mich — A seminar on capital budgeting, geared toward corporate financial executives, will be held here Nov. 9.

Rapidata, Inc., a remote computing vendor based in Fairfield, N.J., will sponsor the seminar, which will consist of a morning and afternoon session.

Speaking at the morning session, held from 8:30 a.m. to noon, will be Dr. Michael A. Moses, associate professor of management and corporate strategy at New York University's Graduate School of Business Administration.

Dr. Julian Lange, assistant professor of business administration at Harvard University's Graduate School of Business Administration, will chair the afternoon session.

The enrollment fee for one session is $75, which includes working materials. For both sessions, the fee is $125 and includes the full seminar as well as related activities.

The seminar will be held at The Management Education Center of Michigan State University, 811 W. Square Lake Road here in Troy.

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Honeywell

Urges More Personalized Service

Recruiter: Ads Won't Find Minority DPers

By Marguerite Zientara
CW Staff

LOS ANGELES — Does your company have trouble finding and keeping minority people for middle- and high-level DP management positions? If it does, and if you are failing to comply with Equal Employment Opportunity Commission laws as a result, it may be wise to consider a different method of minority personnel recruitment, according to a personnel recruiter here.

Tom Rideout, a partner in Human Resource Systems, thinks the popular newspaper ad is a particularly ineffective means of filling personnel needs. If one looks through newspaper want ads, he noted, one sees a large number of black faces depicted in the ads, with the black DP manager in particularly hot demand.

That demand, however, is not being met by many companies using their present recruiting techniques, Rideout said.

"All newspaper ads do is generate a lot of resumes," he added. "I'm more interested in finding one good man or woman than in having 10 resumes."

Rideout — who, along with his partner, is black — cited three reasons why newspaper advertising is not the best vehicle for a personnel search. First, he said, all the ads are basically the same, promising "a great career" but not disclosing any salary information. An applicant might be wasting his time because he has no idea whether his salary requirements are too high or too low, Rideout said.

Second, in a "blind" ad, the applicant risks applying to his own company unknowingly.

Third, according to Rideout, applicants like to be represented by an agent who can provide answers to their questions before they express interest in a position.

Rideout cited two situations particularly applicable to minorities in the systems area: "Black and other minority professionals do not have enough prototypes at the top of major corporations as inducements for them to go work for those companies,"

Minority applicants "are well aware of Affirmative Action and all its ramifications, and they know they're very desirable, but what can they feel their ultimate career potential is when they walk into a company and at the top it's all lily white?" Rideout asked.

Secondly, a company cannot hope to keep its minority employees if the company brings someone in, puts him to work and just leaves him in that job, Rideout said. In a firm like that, the chances for advancement are no better than they were 10 years ago for minorities, he said.

Another reason why newspaper advertisements are ineffective, according to Rideout, is that minorities, by virtue of being security-oriented, are not mobile. "A minority member with five years' experience at one company will be hesitant to move to another company whose philosophy and attitude toward employees are unknown to him," Rideout pointed out.

Personalized Process

In a process that Rideout termed more personalized and therefore more successful, Human Resource Systems contacts companies likely to have a demand for minorities, determines its actual demand and then finds the type of people whose career objectives fit the client companies' demands.

Through various sources, Rideout gets the names of currently employed minority people, calls them up and outlines the opportunities he has. His sources include friends, previously recruited minority members, DP industry members and minority professional societies.

Since 70% of all upper level management positions are created for the applicant, Rideout said, "we expose companies to qualified individuals who are in a position to create their own demand and position."

Rideout's firm charges a fee from the businesses involved on a contract basis. "The clients pay us to go out and find these people they can't find themselves," he said.

It can take anywhere from 30 to 90 days to find a suitable applicant for a company's particular needs, Rideout said, because 11 or 12 people must be screened to find the one or two who fit a company's needs.

Human Resource Systems tries to submit to each client company no less than three qualified applicants for each position. Within one recent week, it recruited seven male minority members with five to 11 years' experience each in the systems area.

Honeywell Has Proceedings Out On Privacy Meet

PHOENIX — The proceedings of Honeywell, Inc.'s fourth national Computer Security and Privacy Symposium, including presentations by 20 authorities in this field, are available to the public.

Among the topics discussed are "New Concerns About Information Security and Privacy;" "Deterrents to Computer Crime;" "Technical Advances in Information Security;" "Security and Risk Management" and "Advances in Computer Auditing," Honeywell said.

The vendor noted that the symposium, its proceedings and an annual workshop series form parts of a Computer Security and Privacy Education Program designed for the entire DP community.

The program "does not reflect the views of Honeywell alone, but brings into perspective the varied views of national as well as international experts in the field of computer security and privacy," a Honeywell spokesman said.

The proceedings cost $25; a limited number of last year's proceedings are also available at the same price.

Orders can be sent to Jerome Lobel, manager of the Computer Security and Privacy Education Program, at P.O. Box 6000 (Mail Stop T99), Phoenix, Ariz. 85005.

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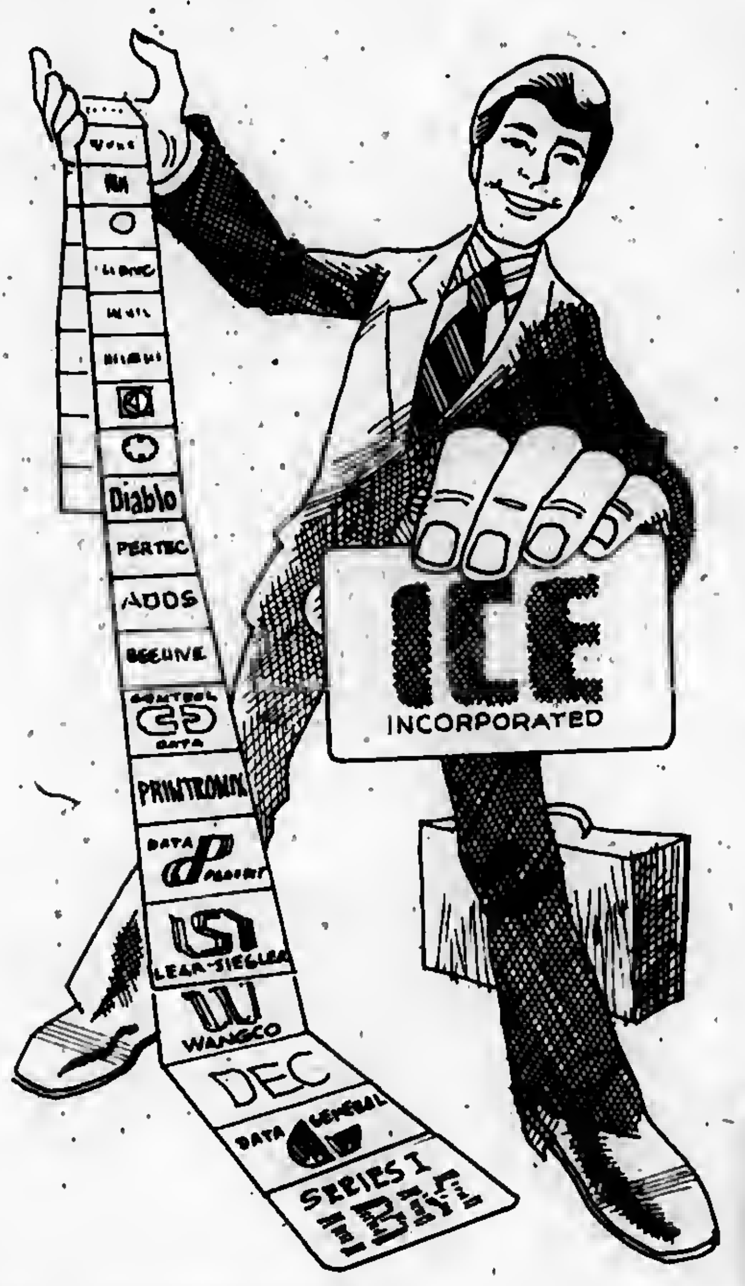

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Afips Shifting Into First Gear on NCC Plans

MONTVALE, N.J. – Although the annual National Computer Conference (NCC) is still more than eight months away, the American Federation of Information Processing Societies, Inc. (Afips), the show's sponsor, has already shifted plans into first gear.

The 1979 NCC, a four-day extravaganza of seminars, workshops and equipment, is scheduled to take place in New York City June 4-7.

Jerry L. Koory, vice-president and director of the Title Services Division of HW Systems, Inc., was recently appointed chairman of this year's NCC administrative committee, according to an Afips spokesman.

The NCC committee is responsible for providing administrative support and guidance to the yearly conference. It also monitors each show's content and quality and assists the NCC board in planning policy functions.

Koory has been a member of the NCC committee since 1970 and was previously a committee chairman from 1971 to 1972. In addition, he is a former chairman of the Congress Guidelines Committee of the International Federation for Information Processing and has served as treasurer, vice-chairman and chairman of the San Fernando Valley, Calif., chapter of the Association for Computing Machinery (ACM).

Personal Computing Festival

Richard A. Kuzmack, a senior economist with the Mathtech Division of Mathematica, Inc., has been named chairman of the Personal Computing Festival which will run concurrently with the NCC show.

The festival will feature technical program sessions on the microcomputer field as well as application demonstrations and exhibits, the spokesman noted.

Recently, Kuzmack participated in the formation of the Personal Computing Society, a national organization dedicated to facilitating noncommercial applications of computer technology. He is also a member of the society's board of directors, the spokesman pointed out.

Kuzmack chaired the first national Computer Club Congress, held in conjunction with the 1977 NCC, assisted in the organization and operation of program sessions at NCC '78 and helped to organize the Chesapeake Microcomputer Club – a Baltimore/-Washington group of computer hobbyists.

Also an ACM member, Kuzmack is involved with its Special Interest Group on Personal Computing (Sig PC).

Afips is a federation of 14 nonprofit scientific, educational and professional societies representing approximately 120,000 individuals concerned with computers and their applications.

The NCC is considered the largest gathering of the computing and information processing community and features a variety of DP-related sessions as well as an extensive exhibition of DP products and services, the spokesman said.

Information on the 1979 NCC and the Personal Computing Festival is available from the society's headquarters at 210 Summit Ave., Montvale, N.J. 07645.

Richard Kuzmack

Calendar Covers D.C. Hearings

WASHINGTON, D.C. – The American Federation of Information Processing Societies, Inc.'s (Afips) chapter is offering a free weekly calendar of information policy-related hearings in the legislative and executive branches of government.

The publication is compiled from a variety of sources, a spokesman noted, and can be obtained from Afips' Bureau, Suite 805, 1815 N. Lynn St., Arlington, Va. 22209.

Witness Statement Exchange

In addition, the Afips Washington office is initiating a Witness Statement Exchange that will provide a means of exchanging recent witness statements made before the legislative and executive branches on information policy issues.

To participate in the exchange, one recent witness statement concerning information policy should be sent to Pender M. McCarter, a research associate at the Washington office. Thereafter, specific witness statement requests can be made by mail.

For each requested witness statement, the spokesman explained, one statement should be included in exchange. The request should, of course, be accompanied by a stamped, self-addressed envelope.

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P39352

Editorial

Back in the Saddle

In one fell swoop, IBM has regained its image as a leader in computing technology, an image that had been slipping a little lately.

With the announcement of the 8100 computer system — and the first system use of 64K-bit chips — IBM has clearly stolen some of the thunder from the more go-go mini makers and semiconductor houses.

However, the same announcement [CW, Oct. 9] held some bad news for users: All of the 8100's operating system software is unbundled. This means users will have to pay for software they previously received along with the hardware.

Like all dark clouds, however, this one may have a silver lining.

The separate charges for operating system software on the 8100 — and similar announcements along the same line expected in the future — will draw more competition into this area.

This increased competition should serve to lower prices for users who are willing to shop around and try third-party operating systems — just as the increased competition in the plug-compatible peripherals and mainframe sectors have served to spur lower prices in those areas.

And, in reality, IBM's software has never been "free"; its price has just been hidden from the users since it was part of the price of the hardware. Users paid for all of the operating system's bells and whistles even if they did not take advantage of all of them. In the new world of separate charges, users should be able to tailor the operating systems software to their needs better than they have in the past.

Only time will tell whether these potential user advantages will become reality, but it seems likely that there will now be more sources of operating systems than in the past and that users will have to spend more time in evaluating software — but the benefits may be large.

On the technology side, the long lead time — more than a year — for delivery of 8100s using the 64K-bit chip may give the mini makers and semiconductor houses a chance to catch up with IBM.

In the world of minicomputers, systems are rarely announced so far in advance of deliveries. In the next year or year and a half before the 8100 is delivered in volume, it is likely some of the mini firms will have systems available using similar — and perhaps superior — chips.

For now, however, IBM has certainly stolen the thunder from these companies — and if it actually delivers systems with the new chip on time, it will have technologically leapfrogged the rest of the industry.

Data Past

Five Years Ago
Oct. 17, 1973

WASHINGTON, D.C. — A bill calling for a federal privacy board to protect individuals against "improper, incorrect or unauthorized compilation or dissemination of information" from computerized data banks was introduced in Congress by 27 members of the House of Representatives. The bill applied to all data banks — state and local government as well as private — and was considered a companion to the Federal Privacy Act introduced by Rep. Edward Koch (D-N.Y.) that would require federal agencies to reveal the existence of data banks to affected citizens.

— — —

TULSA, Okla. — Judge A. Sherman Christensen admitted his computation of antitrust damages against IBM in the Telex case against the firm "involved substantial error." In the unusual move, Christensen said he would grant IBM a motion either to amend the finding he issued in the Telex-IBM case or else grant IBM a new trial on the issue of damages.

Eight Years Ago
Oct. 21, 1970

WASHINGTON, D.C. — In an unprecedented response to the Federal Communications Commission, more than 100 organizations went on record as favoring the establishment of competitive data communications facilities by specialized common carriers. Of 110 responses submitted, 105 favored the establishment of the new carriers.

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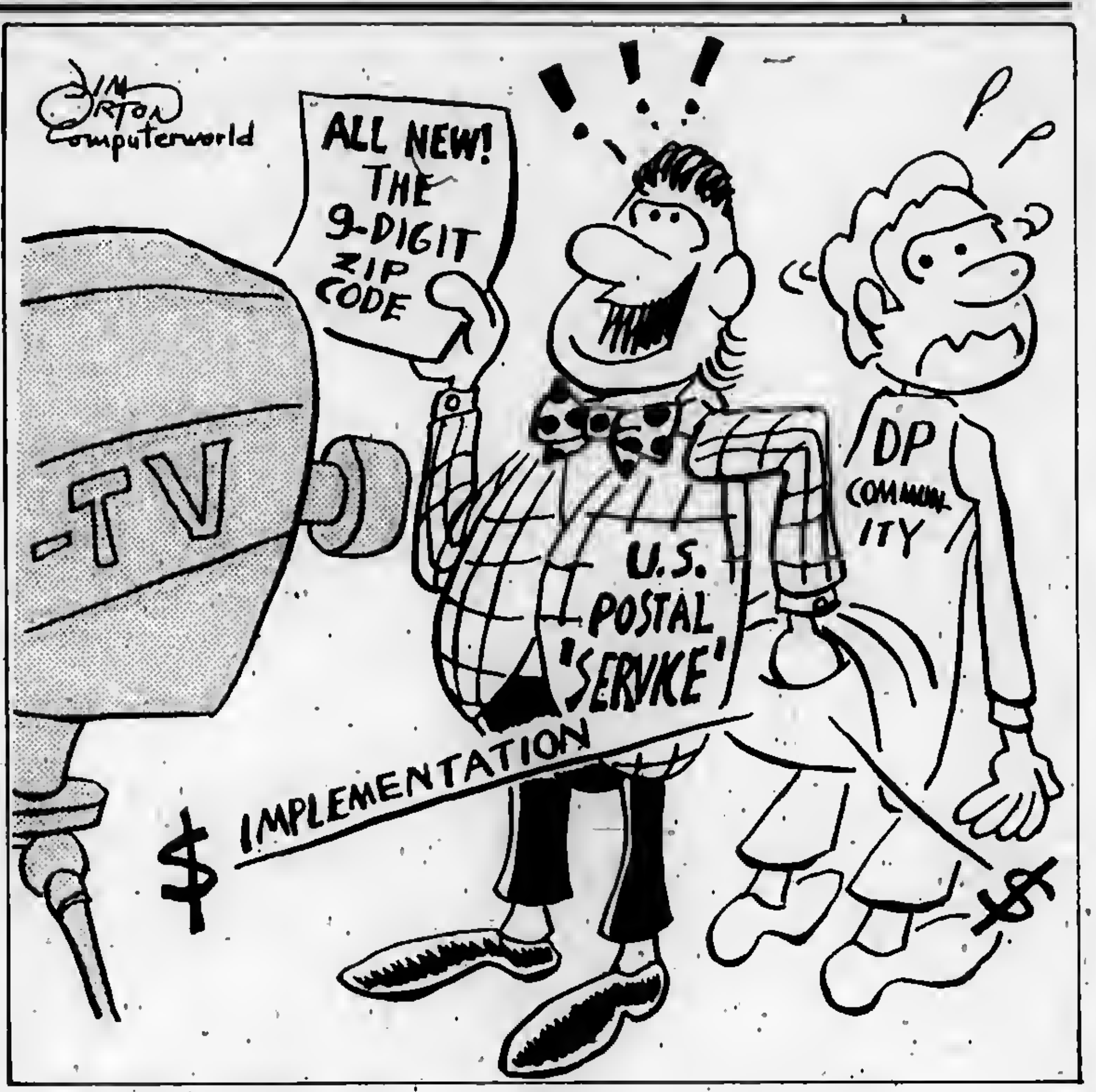
WASHINGTON, D.C. — A computerized court case ranking system, designed by the U.S. Attorney's Office, was showing signs of favoring the guilty and forcing the "innocent" to wait for trial. The system was found to rank cases according to importance: serious crimes were ranked high, minor crimes were ranked low on the scale. Because of overcrowding of the court system, low-ranked cases were more likely to be postponed and innocent defendants kept in jail.



Letters to the Editor

Compensation From Mess

The cost of the bigger Zip Code [CW, Oct. 2] that must be borne by almost all organizations using data processing obviously will be a huge one. Equally obviously, the big Zip will come in.

Let us, however, try to obtain a few *quid pro quos*. Let the large users, the vendors and the DP associations start to lobby now for:

1. Allowing the big Zip to replace city and state on addresses.
2. Requiring that all government organizations (federal, state, county and city) which request geographical statistics use the Zip Code — not state or county or whatever — as the key element.

We will have to comply; but let's try to get some compensation from the mess.

D.S. Owings
Brooklyn, N.Y.

Situation Sounds Familiar

Three cheers for Miles Benson for his "Lying to Management" [CW, Sept. 11]. He described a situation that must be familiar to many of us.

William J. Denholm III
Mountain View, Calif.

Unfair to Dijkstra

"DOD Expects Standard Compiler by 1981" [CW, Oct. 2] was unfair in its treatment of Prof. Dijkstra's criticism of the "Ironman" project. Prof. Dijkstra certainly needs no help in defending his position; he is capable of doing that himself. However, I, as well as many others in the software design business, had similar reactions to the "Ironman" report.

If the publication was indeed the "Ironman" version (i.e., proceeded by much preliminary research and publication, to include "Strawman," "Tinman," etc.), then Dijkstra is indeed justified in his strong criticism.

The "Ironman" publication exhibits most of the mistakes made in many previous language design efforts. One only need read a good example of a language manual, the Algol 60 Report or the Pascal Report, to realize the obvious shortcomings of the "Ironman" report. Mistakes have been made in the past, but the authors of the "Ironman" report paid very little attention to them.

I hope *Computerworld* will give Prof. Dijkstra space in which to defend his attack on the DOD effort. Past and present mistakes should certainly be brought to light before the U.S. taxpayer is asked to finance yet another disaster.

William J. Holst
Stamford, Conn.

Tapes Available Too

I read with interest the notice in the Sept. 4 issue of *Computerworld* concerning the Internal Revenue Service's (IRS) Statistics of Income publications.

Readers might be interested to know that the IRS also makes available, through this office, the publicly releasable data tapes on which these publications are based. The tapes have been processed to protect the identity of all individuals and corporations. Currently tapes are available for individuals for 1966 through 1975 and for corporations for 1965 through 1974 (1975 should be ready soon).

This office also makes available the data tapes of a growing number of other federal government agencies. A *Catalog of Machine-Readable Records in the National Archives of the United States* is available free of charge. Interested people should contact the Machine-Readable Archives Division, National Archives and Record Service, Washington, D.C. 20408.

Charles Gellert
Archivist
General Services Administration
Washington, D.C.

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The Human Connection

Costs Rise, Benefits Soar for On-Line User

By Jack Stone
Special to CW

It was almost two years ago that I first interviewed Bob Currie for this column [CW, Dec. 20, 1976]. He was then director of evaluation for the domestic programs of Action, the U.S. federal government agency responsible for coordinating volunteer social services programs worldwide.

The column dealt with the discouraging experiences his group endured while trying to get its computer center people to develop statistical analysis programs. It ended on the note that the group was forced to go to a local service bureau to get decent support, shortly after which the in-house machine operations of the center were discontinued.

Well, I heard that Bob recently changed jobs within the agency, so I thought it might be interesting and timely to interview him again and report on the DP progress achieved during his tenure. Here's what he had to say:

Most of us grew up in the social program area with almost no background or experience in DP. Yet the service bureau people greeted us with open arms. Let me describe how we operated before we moved onto the bureau's machine and then how we got to where we are today.

The original procedure was for our evaluator to specify the general type of analysis to be applied to our master data bases for the purposes of an evaluation report.

The data bases contained information on volunteers and project histories. This need was passed to one of our statisticians, who selected or wrote an algorithm. Then this person, in turn, brought the problem to the programmer in the agency's computer center.

When the programmer had time for us — which was rare because we were the low man on the user totem pole — the algorithm would be coded up and run against the data bases.

Turnaround Troubles

Well, it doesn't take much imagination to see the problems we had in turnaround. And the frustration levels ran high since we just never felt we were obtaining proper service.

First, the service vendor provided us with a package of statistical programs, SPSS, expressly designed for the social sciences. By using this software in conjunction with our master data bases, we eliminated the need for the programmer. We were amazed to find out that we could achieve just a few hours' turnaround for any of our jobs, which, of course, we ran in the batch mode.

Then, as we came to know the procedures for using the software, we reassigned the statistical specialist to more creative work. So at this point, the evaluator was able to design his own evaluation strategy, invoke the proper statistical routine and execute his job without further assistance from computer center personnel.

The next step was to install a terminal for the purpose of submitting jobs on a remote-batch basis, which turned out to be comparably priced to messenger service and much more convenient. But this method soon gave way to the use of the terminal in the interactive mode, when the vendor supplied us with an on-line version of SPSS, called SCSS.

The device we're currently using is a combination word processor and terminal. It allows us to store results from processing on a magnetic medium. Now the evaluator uses the machine in word-processing mode to select the proper level of output and to structure a narrative report in a usable format. This strategy allowed us to cut down the time for report production.

If I were to sum it all up, I'd say 'What a change!.' Our problem used to be too little information far too late; now our problem is too much information too quickly. The evaluators have become so productive that we must now learn how to summarize effectively so that our management can use the information easily.

Sure, our costs for DP have really increased during recent years, but now we are really proud of the job we're doing.

Next week, Currie discusses the impact of the outside operation on the DP department and top management of the agency.

The Taylor Report

Some User-Vendor Rows Best Settled in Court

By Alan Taylor
Special to CW

Recently, Dick Brandon, president of Brandon Consulting Group, Inc. in New York City, wrote that he would take his hat off to NCR Corp. for requiring arbitration while IBM steadfastly opposes it [CW, Aug. 14]. He thought the NCR clause I quoted in my column [CW, July 31] was "perfectly normal" and one he would "gladly accept as a user representative in negotiation." Furthermore, he thinks arbitration will produce better informed decision makers.

If this is so, I assume he hasn't recently faced the consequences of such clauses or discovered how they destroy the few legal rights the user has when he accepts a vendor-written contract.

More than once, I have had to face such problems; my comments come from experience. After reading Brandon, I still say "thumbs down" on arbitration.

Point of Contention

First of all, Brandon thinks the NCR arbitration clause is "perfectly normal, acceptable," while I think it is too stringent. A standard arbitration clause, recommended by the American Arbitration Association, would not force so much into arbitration. It would only cover the precise contract in which the clause appeared and would leave open all other matters, for ordinary legal actions.

By contrast, the NCR arbitration clause covers all supplies, without contract and all contract disputes — in fact, all relationships between the two firms.

In point of fact, the NCR clause could effectively be translated as follows:

Any controversy arising out of any contract, of or out of the furnishing of any equipment or service to a customer, whether or not under this agreement, shall be settled by arbitration, and not by the courts.

Doesn't such a clause force too many matters under arbitration?

Better Decision-Making?

Brandon's second point was that the process of arbitration allows for more expert decision-making since judges don't know computers. With all due respect to judges, Brandon has something there.

But can computer knowledge — even when allied with business experience — substitute for knowledge of the law?

Most computer contracts forced on users by vendors contain very tricky language and require an understanding of law — even more than an understanding of computers — if the weaker party is to obtain the little that is offered. To illustrate this point, let us examine the very contract Brandon raved about, the NCR

(Continued on Page 28)

Reader Commentary

Cybernetics Struggling With Practical Problems

By Victor Glushkov
Novosti Press Agency

So far "intelligence" tests for machines that may one day take over most of the brain's functions must be the same as for man; we cannot expect too much. We do not promise to build an artificial intellect brilliant in all respects by the end of the century; however, there are thousands of people who are neither a Tolstoy, nor a Pushkin, but are extremely important and valuable for society.

In the future the machine will, of course, be more "quick-witted" than man. The human brain consists of some 14 billion neurons, devised in a very spendthrift manner.

In order to fully imitate our brain, scientists will require fewer computer cells than neurons, but an enormous gain in speed. A living neuron performs 30 or — at best — 50 operations per second, while a computer element can handle more than 100 million operations per second.

For this reason, it is possible that, some time in the future, a brilliant machine intellect will be built which will excel the human one in any field of endeavor. But when this will happen can only be guessed at this stage.

Really Necessary?

The question arises, do we really need artificial intellect comparable to our own? In the development of technology, man solves only the most practical problems. Why create a machine capable of turning out 10,000 novels a year or producing in mass editions such perfect works of art as Leonardo da Vinci's "Mona Lisa" or Botticelli's "Primavera"?

The value of each would be reduced, making it not worth the trouble.

I think that cybernetics will develop according to classical formula, "The demand determines the supply." Today industry needs robots orienting themselves freely in space and able to understand and carry out vocal commands. Since this problem arises in our practical activity, it will be solved.

Rivalry between man and machine is not our aim. The USSR is presently devoting much attention to mass-producing robots to work in factories. Computers are best used to free man from the enormous number of routine operations with which any type of his creative work is unthinkable, to reinforce his intellect and to rid him of most mechanical works.

Fear of 'Breaking Loose'

But if man does succeed in creating an intelligent machine, some people say, it may be that the robot will try to "break loose." I absolutely disagree with Norbert Wiener, the father of cybernetics, on this question.

(Continued on Page 26)

Reader Commentary

DPers Must Learn Users' Decision Criteria . .

By Jim Ryan
Special to CW

When a computer systems engineer quotes accuracy figures on his system, error rates as one in a million are freely tossed about. On the other hand, a student with a score of 95% is rated in the excellent category, when in fact the error rate is five parts in a hundred.

The difference between these two standards is, in my opinion, the cause of much of the confusion between the computer industry and the public, the ultimate users of computers.

Unfortunately, the cause of this confusion can be traced directly to DP people themselves in their overzealous claims about systems' accuracy. They often fail to qualify these claims by stressing the fact that all computers are basically only tools to be used by people and are only as good as the people using them.

Because of the excess emphasis on hardware accuracy and the lack of emphasis on people, DPers are being charged with constantly increasing numbers of failures because so many daily activities now involve computers.

In the actual case, competent computer users are always aware of the relative accuracy of their computer printouts. Real computer errors usually can be spotted immediately, because they do not fit into the basic flow of information or statistics when the report is reviewed as a total document.

Subtle Situation

It is the more subtle situation, caused by errors or deliberate distortions in the input documents, that makes the printout more or less valuable to the user.

In the final analysis, it is the user who must determine what use is to be made of the output documents, based on his knowledge of the accuracy of the input information. Even in the field of mathematics, the user has an order-of-magnitude result in mind when the printout is received.

Generally, however, DPers frown on users who insist on making what they believe to be "seat-of-the-pants" decisions. The concept of questioning computer printouts if they do not agree with intuitive answers is not accepted by DPers, but a successful executive's seat-of-the-pants conclusion is really often the sum of many years of intellectual experience in a particular field applied to a specific problem.

If the printout does not agree with the preconceived estimated answer, the true executive is usually willing to make further tests to arrive at a considered judgment.

In Direct Opposition

In direct opposition to this philosophy, there are many people who have managed to have successful careers without ever making a decision for which they can be held accountable. These people spend thousands of dollars gathering information, then develop elaborate codes, filing systems and DP systems with extensive hardware to match, all of which is used to obtain voluminous printouts which are published with great fanfare.

The result is many contradictory reports issued from supposedly highly qualified sources. They all have one thing in common: they are published without considered judgment on the part of the author. This is often done deliberately because it does not leave the author open for criticism; supposedly, the DP-based decision is final.

It also allows the user to avoid serious thinking, which in turn makes it increasingly difficult for reasonable people to study a problem, arrive at a mutually satisfactory solution which can be accepted by another group of equally responsible people. The computer has contributed its share to the unusually self-centered attitudes of many groups today.

Discussions With Users

DPers can help reduce this confusion if they have the courage to at least discuss with the user the true value of printouts as they relate to the problem being considered. To do this, however, DPers will have to become aware of the many factors other than computer printouts which go into making decisions.

The alternative is to be identified as the machine operator who produces information based on the input received without using any judgment other than that required to produce the most efficient and most economical computer results.

This alternative is not really acceptable because computers are too intimately associated with people in contrast to other types of machinery that produce various results or products.

For example, the typewriter is nothing but a mechanical means of conveying information; it cannot add to or detract from the information typed in. The computer, on the

(Continued on Page 25)

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(Continued from Page 24)

other hand, can, with suitable software and carefully selected input, be made to produce an output which is completely biased in favor of a particular position, with the user's original thoughts being lost in the output.

Because computers are now such an important part of everyday life, it is becoming a growing responsibility of DPers to become intimately involved with the truth of their printouts if only to protect themselves.

'Breakage' Concept

Just so that this will not appear to be too theoretical, let's move the discussion into the purely statistical side of the computer field. Probably the most obvious subject is inventory control. Here we become familiar with the concept of "breakage," which is the difference between the records and the actual inventory taken at any time when the records and the physical plant are temporarily frozen to eliminate the time factor in a comparison study.

Prior to DP systems, it was a commonly accepted practice to manually reconcile the difference between the physical inventory and the records. It was often a harrowing experience, but since volumes were relatively small and all records were physically available in easily understood form, it was usually possible to reconcile the differences, bring the breakage down to an acceptable level and charge it to specific elements.

Because of high volumes and because mechanized records are now being input by many people who are not part of responsible management but who are simply doing specific narrow functions, the input error rate — and in some cases the deliberate falsification of input information — has caused the breakage level to be increased substantially.

In many cases, the situation has deteriorated to the point where an acceptable breakage level has been determined and is simply charged to the cost of doing business. The ultimate cost is charged to the customer, in the form of higher prices. As long as this does not result in pricing the company out of business, all is well.

Under these conditions, if all companies are equally in difficulty, the breakage point can be quite high and remain acceptable. There seems to be ample evidence to prove that there is now a high breakage level, if the number of identified white collar crimes is any criterion.

Reasonable Explanations

To counteract this condition, perhaps it might be possible for the DP industry to do what other industries have done with some degree of success. It can develop a program that will automatically break down the total breakage into hardware and software errors, human errors and deliberate civil or criminal falsifications.

The general public is conditioned to reasonable explanations of even criminal acts; what people do not like is voluminous documentation which either proves that the error was not the author's fault or smothers the problem so that the reader is totally frustrated.

What is needed is a computer-oriented program that emulates the manual process followed during an audit of any industry. A true audit must include all entry information as well as software and hardware features of any system. The hardware features have been amply covered by many types of testing equipment using sophisticated diagnostic testing procedures.

The problem is to develop computer programs that will check and verify software and user input with the same tolerance levels now used in hardware diagnostics. This can only be done by using auditing techniques that involve a separate method and a considerable amount of cross-checking.

For this type of operation, modern "hand-shaking" procedures are available at a reasonable cost. It seems the DP industry is now sophisticated enough to be able to develop computers to check other computer systems from user input to final output.

If computer usage continues to expand at its present rate and white collar errors or deliberate falsifications expand equally rapidly, the computer industry may be forced to develop countermeasures to survive.

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USSR Grappling With Cybernetics Issues

(Continued from Page 23)

Wiener suggests that the more sophisticated the machine and the more unpredictable its behavior, the greater is the probability of its refusing to act as it is bid. The theory of reliability of technical means has long since proved that whatever the machine's degree of complexity may be, there exist purely mechanical means by which any required level of reliability may be ensured.

The most interesting and promising work we are doing at the USSR Institute of Cybernetics appears to be an automatic system capable of proving mathematical theorems. We have set for ourselves the task of designing a machine which would amplify the abilities of the mathematician and would help him.

The MIR series which we created not only makes computations, but can also deduce formulas — for example, Newton's binomial. Using the electronic computer, this and many other formulas may be deduced quickly and simply, because the computer's operating speed is significantly higher than that of the average mathematician.

Spontaneous Reasoning

Now there is talk of logical reasoning of a spontaneous nature. Here, too, a great deal has already been achieved. A fundamentally new approach has been found, a special new language which enables man and machine to communicate.

There is now a set of algorithms that enables the computer to make logical deductions given a certain set of facts. Elements capable of handling this sort of knowledge have been created and will soon be introduced into computers.

In the laboratories of our institute, we have a second-generation robot with eyesight, hearing and a voice. What is more, the voice is not just human speech recorded on a magnetic tape. The machine itself constructs sounds, picks up objects and moves them in space and builds structures from bricks.

We are also working on the identification of images. How is one object to be distinguished from another, a man's face from a woman's? If machines could learn to do this, it would mean fantastic possibilities for the national economy.

Essentially, nearly all the problems of artificial intellect boil down to the maximum reduction of excess variants. To instantly recognize an object, idea or image and see it against the background of others, rejecting all the rest, is the hitch.

The creation of an organ of vision is equivalent to the human eye in what it perceives is so far just a dream, and we think that it cannot be done until the end of this century.

The institute has concentrated on problems relating to the training of machines. There are special programs of instruction, for instance in chess, where not merely an algorithm of chess but an initial knowledge in this field and the ability to learn more are programmed into the machine. This is an alrorithm with narrow specialization.

In a particular field we can produce an algorithm which will enable the machine to learn more quickly than even the most brilliant person. But this can be done in only one narrow field; whereas simultaneous learning in a broad spectrum of fields has not as yet been achieved.

Toward the end of the century and even earlier, we expect to have fully automatic engineering and building plants in which robots will replace people in all complex and labor-consuming operations; on assembly lines and working with machine tools.

Glushkov is director of the Institute of Cybernetics at the USSR's Academy of Sciences, Ukranian branch.

Letters to the Editor

In Search of Answer

I am a student in data processing at Indiana Technical Vocational College and am researching the question of why most printouts are on green-and-white striped paper. Not white without stripes, not soft yellow or pastel blue, but white and green. Frankly, I suspect I have been given this assignment because the instructors have not bothered to ask the tradesmen. Any answers?

Eugene Hutchen
Gary, Ind.

Inappropriate Slanting

"Pentagon Split on Effectiveness of Crisis Aid" [CW, Aug. 14] was, in my estimation, much more suitable for a publication such as the *National Enquirer*. The headline and the first two paragraphs were written in a style that would do a *National Enquirer* reporter proud.

I am disappointed. In a publication such as *Computerworld*, I expect articles to be written in a professional manner. Facts should be presented, not statements such as WWMCCS "does not work." Such a statement is not supported by the rest of the article, nor does quoting "news reports" make it any more valid.

Bruce E. Andrews
Renton, Wash.

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Agenda

Morning—For Operators

Introduction

—Overview of Monitoring Methods
—Background versus real-time monitoring
—Problems with real-time monitoring
—OMEGAMON approach to monitoring

OMEGAMON Exception Analysis

—Why jobs are waiting
—Monitoring TSO response problems
—Catching looping jobs and TSO users
—Reasons for console lockouts
—Explanation of *enqueues* and *reserves*
—Hardware problems

Afternoon—for Systems Programmers

NEW PRODUCT ANNOUNCEMENT—EPILOG
(See Page 31 October 16 issue of Computerworld)

—Monitoring disks: reserves, head movement, dropped ready
—Introduction to SRM (changes with MVS/SE)
—Case histories of MVS monitoring experiences

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And Farley Harthwait Knew It

'One Step at a Time' the Route to Insanity

By Miles Benson
Special to CW

Sociology of Computing

How do you manage a large, complex software implementation? One where the software is embedded in a system of even more complexity, where fitting all the schedule pieces together is just as complicated as fitting all the technology pieces together?

"One step at a time" is the answer at Wings Aloft Avaiation. But "one step at a time" has a very special meaning.

It's that special meaning that rankled Farley Harthwait. Farley, once a real-time programmer in Wings Aloft's avionics software department, is fiercely independent, sharp as a trailing-edge technologist who had a hard time fitting into the Wings Aloft mold.

"One step at a time," at Wings Aloft, means breaking a large task down into small work packages, and scheduling each package, and never deviating from that schedule. It's the last item in the list that bugged Farley.

Here's how it works. Let's suppose Wings Aloft is building the avionics system for a new fighter plane, the F-21. That system might include an airborne computer, interfaces to sensors for such things as navigational and radar hardware and the software necessary to support all that.

Typically, the software might break down into an executive program, application systems for the navigation and other external interfaces, some glue and spit polish to hold the whole thing together and maybe even support software, such as compilers and assemblers and loaders, to aid in the construction of the applications.

Now, break that package down, "one step at a time." Perhaps there's an exec task, and a set of applications tasks, and a glue-and-spit-polish task and a support software task.

Done? No, not yet. Because each of those tasks must also be done "one step at a time." Define requirements. Design. Code. Test. Integrate. Acceptance-test. Deliver. The work pages get down to "wrap your arms around it" size.

Now, picture the performance of those tasks. They're all laid out neatly on a schedule, right? With little tick marks for each milestone. And managers who care very much about each of those tick marks. "Too much," Faley says.

You know how schedules are. They're educated guesses on how the job might turn out. If all goes well.

Well, that's true at Wings Aloft, too, of course . . . except that it's not true. Because of the complexity of the total system, concrete and Holy Water are sprinkled on those schedules. The result is predictable. The schedules, guesstimates though they may be, aren't allowed to flex.

Right Job, Wrong Schedule

Let's get down to cases. Farley was responsible for the Nav package on the F-21. And he nearly went out of his tree.

You see, he got behind schedule on the coding task, and the reason he got behind schedule is that he got ahead of schedule on his integration task.

Farley realized, halfway into coding, that until he was sure of his interfaces, there was no point in proceeding. Undoing bad code is harder than starting from scratch on good code, right?

So Farley began testing his interfaces using a rudimentary version of his Nav code to see if he was on the right track.

Now, here's the rub. Farley's manager was disturbed about his schedule slide. Frantic, you might even say.

The manager gets scored primarily on cost and schedule performance, you see. Being off-schedule is like building the wrong product to a technologist. The words reserved for an off-schedule manager at Wings Aloft are decidely unkind.

Are you beginning to understand Farley's dilemma? He was doing his job right. It was the schedule that was wrong.

The Bigger Picture

Let's back off a hundred meters or so and look at the bigger picture. If Farley did what his manager wanted, and went by the schedule, he would he throwing an element of risk into the longer term schedule. Satisfying the near-term schedule in all probability would mean hurting the follow-on ones.

And the same system that rewarded Farley for his short-term performance would surely punish him for its long-term impact.

Remember when I said earlier that, although they don't seem to realize it, schedule slavishness bugs others at Wings Aloft as well as Farley? Now you can begin to see why. A crisis attitude is spawned early in each project by imperfectly conceived schedules. The crisis never abates.

After considerable soul-searching, Farley finally realized that his sanity demanded that the technical needs of the task overrode the schedule needs. "My manager he damned," he thought to himself. "Someone has to do the job right, even if no one wants me to."

Well, Farley's stay in the Wings Aloft mold was both uncomfortable and short. Management wasn't interested in schedule-deviant behavior, they told Farley. When he declined to concentrate on his coding tick mark and defer his integration, he was marked for departure.

When the F-21 project task was all through, so was Farley.

This isn't a sad story, though. Farley quickly picked up a job at Clickety-Clack and Western Railway, doing transportation system simulations. They appreciate Farley's independent spirit and sharp mind there.

They still do things "one step at a time," of course. But to a realistic schedule, malleable when added knowledge is available. Farley feels right at home.

He may have planted a small seed of sanity back at Wings Aloft, however. The managers there, although they're sure they did the right thing in laying him off, are scratching their heads over one question.

"How can a guy miss nearly all of his milestones," they muse collectively, "and still be ahead of schedule on his final delivery?" Maybe some day they'll figure it out.

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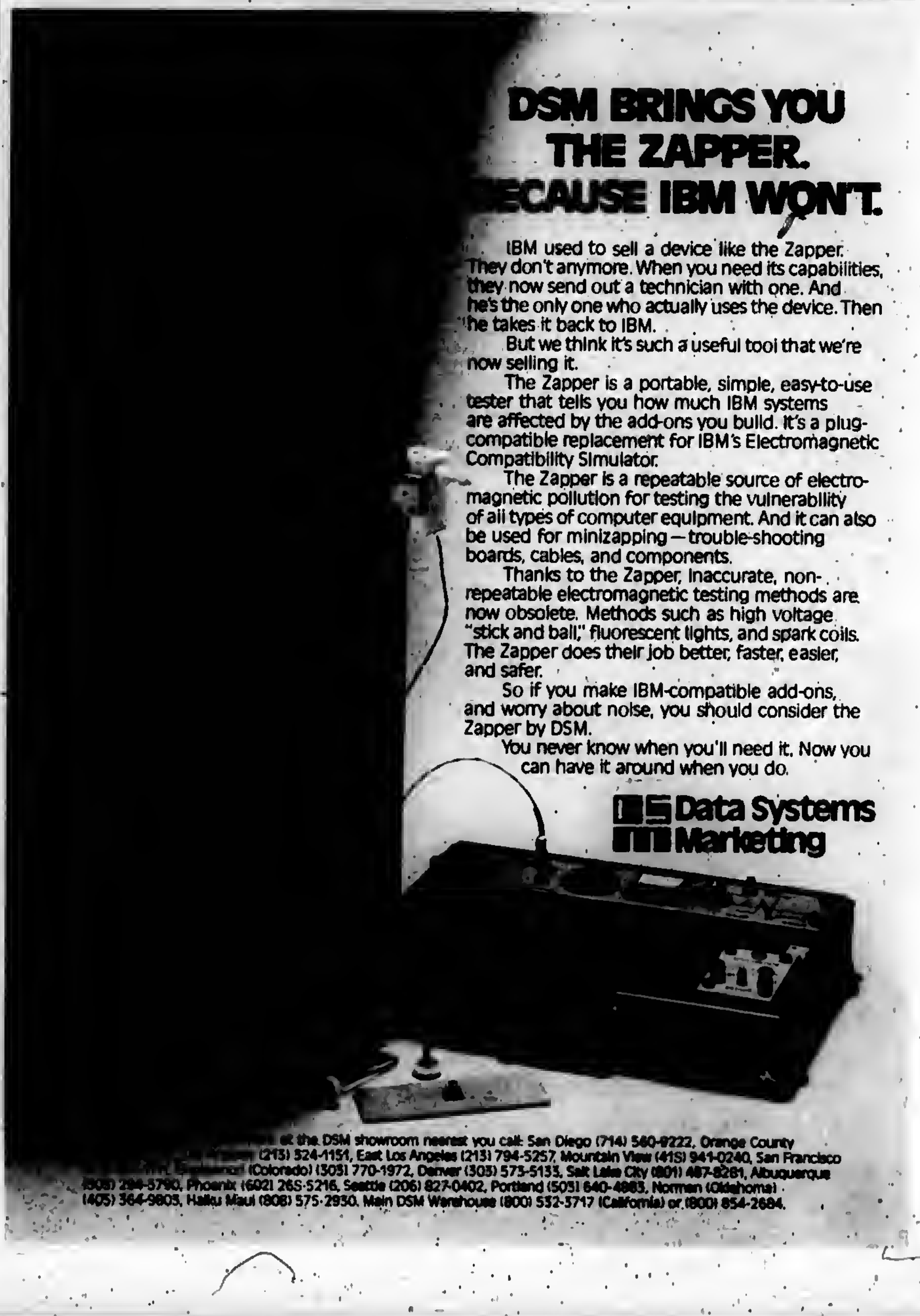

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Advice to Women Moving Up: Be Yourself

By Aretta J. Evans
Special to CW

I have read two articles by Donnamarie White [CW, June 19 and July 31] and a couple of letters from angry women in the DP field. Although these letters expressed the readers' irritation, they did not suggest an alternate pattern of dress and behavior. I wish to comment on White's set of arbitrary standards.

As far as clothes are concerned, I think neat, attractive clothes in most any style are acceptable. Common sense will tell most women what's appropriate in a business environment.

Do your job the best way you can and, if your supervisor one day happens to say, "Good job," don't make the mistake of telling him it was nothing — he'll believe you. Instead, take the opportunity to tell him about a new technique or routine you're using.

Reader Commentary

Behavior should he natural. Trying to force yourself to oct self-confident and self-assured would be disastrous. Your supervisors might see through the farce and think you are a phony. Besides, if you aren't self-confident in your present position, you aren't ready to move up the ladder.

If you happen to be a bit different — eccentric, some people call it — don't be afraid to let yourself shine. Some of the most successful people I know are considered nonconformists. Top management might be looking for new ideas and talents.

My last point, I think, is extremely important. Although the company president may admire a trait in one person, he may find the same feature catastrophic in another person.

For heaven's sake, do not emulate anyone. If I'm going to lose or win a position, I must be judged on my own faults or merits.

I respect White's opinion. Her system for getting to the top worked for her, but I don't think there is any set of rules that can ensure a woman will "make it."

Settle Disputes in Court

(Continued from Page 23)

contract for its Criterion systems.

Criterion CPUs do not, in themselves, have a machine code users can implement. "Firmware" provided by NCR makes the system work; without it, the system is valueless.

Let us consider a hypothetical sales agreement between a user and NCR for the purchase of a $100,000 Criterion. What has the user bought? Does he own a working machine?

Problems arise when one reads the 10th paragraph of the universal agreement in the NCR contract entitled, "Ownership of Software and Confidentiality." NCR slips in the point that it will maintain ownership of the "firmware," defined here as progroms.

Most people would not think NCR's ownership of programs could result in their computers becoming nonoperational. But the agreement also stipulates that all programs provided by NCR shall be and remain its property, despite any sale.

So, what can the user sell? What does he own? As far as I can see, a Criterion buyer who has signed one of these arbitration clauses is apparently paying for an unusable piece of ironmongery and is completely dependent on NCR's goodwill to make it of any value.

As for reselling a Criterion, look at the way Honeywell, Inc. destroyed the second-user value of its computers by reinterpreting their duties. We have no reason to believe NCR will not do the same when Criterions enter the secondhand market and go into competition with whatever it wants to sell next.

Value of Law

Because of its understanding of the law, a court would be able to stop such chicanery; only a fraud charge need be filed. On the other hand, an arbitrator with a DP background is unlikely to have a detailed knowledge of DP, business ond law.

Even if an arbitrator is proficient in all three areas, the legal requirement of "clear proof" of fraud creates difficulties. NCR would fight discovery, the right of the lawyers in court cases to see secret papers and talk to potential witnesses.

So, the whole matter becomes a hidden "Catch 22." You can't prove fraud until you get discovery, and you can't get discovery until you prove fraud.

No, I can't agree with Brandon. Arbitration clauses should be made optional or abolished, at least until they are narrowly defined and genuinely protect users' rights.

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Suffering from system hang-up?
DOCS-Display Operator Console Support has the cure...

The hang-ups in most IBM S/360 and S/370 systems are directly related to the system console functions whether the native console is a typewriter or a display unit. **DOCS** permits the entire system to approach its full potential. Here's why:

HANG-UP:	CURE:
Native console support is slow.	**DOCS** enables the system to perform 20-40% faster.
The console is attached to the CPU.	**DDCS** provides physical flexibility by allowing the console to be as much as 2000 feet away from the CPU.
Outstanding reads go unnoticed.	**DDCS** shows all reads in high intensity and optionally sounds the audible alarm on LTA reads.
Convential OOS and OOS/VS allow only single thread console activity.	**DOCS** permits concurrent console activity including Multiple Outstanding Reads.
The system hangs up when the convential console device becomes inoperable.	**DDCS** allows the system to continue to write messages to the CRT thereby allowing the CPU to keep on running.
Someone needs a copy of SYSLOG data for a job being run.	**DDCS** provides all SYSLOG data in any or all of three ways: 1) Trickle hard copy to a typewriter or 3270 type printer. 2) All SYSLOG data can be printed on SYSLST at end of job time. 3) OOCSLIST provides a time-stamped archival listing of all SYSLOG data.
Operators don't know the current status of the system.	**DDCS** Dynamic System Status Display details job names and program names which are currently running as well as those that are waiting and the resource they are waiting for.
OOS and OOS/VS support only one console.	**DDCS** supports multiple consoles.

ACP Million Dollar Club

DOCS will run on both S/360, S/370, and 3031 OOS and OOS/VS and give added support beyond that provided by the IBM program products on the S/370/138, 148, and 158 CPUs.

DDCS will run along with other spooling or control packages such as EOOS, GRASP, GRASP/VS, OOS/RS, POWER II, ASAP, ASAP/VS, POWER/VS, ITEL's DOS/VS, and OOS/MVT.

DDCS is available from C F S, Inc. as a licensed program product and may be leased monthly, yearly or on a one-time lease arrangement for $175.00, $1,890.00 and $5,670.00 respectively. All three plans include free maintenance for as long as **DDCS** is installed.

Send requests for **DOCS** to C F S. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:

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C F S, Inc.
1330 Boylston Street, Suite 608
Chestnut Hill,
Massachusetts 02167
(617) 566-0222 Telex 94-0265

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1330 Boylston Street, Suite 608
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Now in Two Settings

'Edpep' Links Firms, College, QED

By Don Leavitt
CW Staff

TEANECK, N.J. — The main campus of Fairleigh Dickinson University here is the setting for an unusual DP-oriented professional training program that involves the university, nearly a dozen New York- and New Jersey-based corporations and QED Information Sciences, Inc.

Modeled after a similar program QED has run with Babson College in Wellesley, Mass., for New England companies since 1974, the EDP Education Program (Edpep) blends the training needs of the local companies with the facilities of the university and instructors provided by QED.

Fairleigh Dickinson has initiated another program for DP professionals this fall, leading to a Masters of Business Administration degree in management. It's a two-year "weekend option" program that allows people to grow professionally while continuing their job assignments, the university explained.

The initial member companies of the Dickinson-based Edpep include American Cyanamid, American Hoechst, Ciba-Geigy, Educational Testing Service, Interspace Corp., Lederle Laboratories, Medical Economics, Schering-Plough, Squibb and TRW, Inc.

Each of these member companies has purchased one or more subscriptions to a series of nine seminars and workshops being conducted at the university. Each subscription entitles the company to one seat in each course.

The New Jersey Edpep is under the joint directorship of Robert C. Sedwick, dean of the College of Business Administration at Fairleigh Dickinson, and Lawrence Grodman, president of QED. The project coordinator is Bruce Frank, a well-known DP consultant and instructor.

This fall's schedule includes 32 days of classes. The first subscription costs a company $2,400 well below the cost of a comparable amount of training provided through conventional commercial seminars, according to Grodman.

Additional full-program subscriptions cost $2,000 each. Member companies may also enroll additional people in selected courses at "very nominal" fees, Grodman said.

Cooperative Planning

Planning for the courses is in the hands of the member companies. An advisory council that consists of the training director from each company meets regularly to monitor and fine-tune the program, discuss possible courses and generally maintain control over the content and quality of the program.

The cooperative nature of the Edpep approach is emphasized still further by the exchange of personnel between the Boston and New Jersey programs. If seats are available, employees in member companies of either program can take any courses they want, up to the limit of their company's subscription.

Whether at Babson or Fairleigh Dickinson, Edpep is still open to other interested companies and some of the courses — especially new offerings — are open to nonmembers as well, according to QED.

Courses in the 1978 fall program at Fairleigh Dickinson include a five day systems analysis workshop, three days on "Fundamentals of Data Communications," three days on "Project Management and Control" and five days on "Effective Systems Design."

Distributed computing systems will take three days; data base design systems, four days; and structured design and programming, another four days.

Completing the spectrum, from each end of the software life cycle are two days devoted to the user's role in systems development and three days on computer control and audit.

Having the Fairleigh Dickinson operation under way and the Babson Edpep well established, Grodman admitted his company is now discussing the possibility of initiating Edpep in "several cities across the U.S." with major universities.

QED Information Sciences is at 141 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

Monitor MVS Compatible

ANAHEIM, Calif. — A feature that allows IBM MVS and TSO users to develop programs online and dynamically execute them after setting breakpoints is part of Release 3 of the Tone 3 time-sharing monitor from Tone Software Corp.

Under the Test feature, when a program is interrupted, register contents, storage locations, instructions and program status words can be examined for verification of correct execution. The user can then resume execution and check later at another breakpoint, a spokesman noted.

Several enhancements have been added to this version of Test, he added. They include the ability to list breakpoints that have been set and a WHERE command that lets the user know where he is in the execution of his program.

Release 3 will support the IBM System/32 and 43-line 3270 devices with all 24 program function keys being user-programmable, as well as IBM 3275 dial-up and 3790 Synchronous Data Link Control (SDLC) terminals.

Tone 3, including the Test facility, costs $26,500 or $825/mo, the company said from 1124 N. Gilbert Ave., Anaheim, Calif. 92801.

'Look' Gets Enhancement Options

PRINCETON, N.J. — Histogram and point-plot facilities are two features Applied Data Research, Inc. (ADR) has included as a part of an optional enhancement package for its Look real-time performance evaluation system.

The Extended Performance Analyzer (EPA) option operates in conjunction with Look on IBM 360 and 370 mainframes under OS/MVT, OS/VS1 or OS/VS2.

Long-Term Measures

The enhancement package is a long-term measurement facility for calibrating system performance that is capable of summarizing the data provided by Look and recorded by Looklog, according to a spokesman. EPA analyzes and condenses performance data and presents output in the form of histograms, point plots and statistical summaries of system utilization.

EPA and effectively detect system imbalances, monitor resource consumption, plan for additional resources and capacity, tune installation performance specifications (IPS) in MVS and measure the effects of environmental changes on total system throughput and availability, the spokesman claimed.

The analyzer's command structure reportedly allows users to specify scaling factors, line components, graphic overlays and other output characteristics, as well as to individually define job, task and/or resource categories.

The package can also be used to display multiple resources on the same graph or summary, the spokesman noted.

Looking for Trouble

EPA features an archival capability that compresses large volumes of data and a trend analysis function that helps the user anticipate potential trouble spots and make management decisions.

The EPA option sells for a permanent license fee of $3,500; Look itself is available for $5,300 to $6,000, depending on the user's configuration. ADR is at Rt. 206 Center, Princeton, N.J. 08540.

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Users to Meet

NEW YORK — Users of the Inquire software from Infodata Systems, Inc. will be meeting at the New York Sheraton Hotel next week.

The conference will include information about Infodata's product development, user presentations and a choice of workshops, a vendor spokesman said from 5205 Leesburg Pike, Falls Church, Va. 22041.

Sort Facility, Too

Indexed Files Supported on Series/1

THORNWOOD, N.Y. — A package that reportedly includes both a comprehensive indexed access method and a sort facility for users of IBM Series/1 minicomputers running under the Event Driven Executive (EDX) operating environment is now available from the Systems Guild, Inc.

With the Guild software, multiple indexes can be created and maintained for any data file, according to a spokesman. An indexed file may be read sequentially forward or backward by any index, he claimed.

Single records can be retrieved by either full or partial key, he added.

Handling multiple files concurrently, whether accessing or sorting them, entails the use of multiple copies of the Guild logic; as processing is completed for one or more files or indexes, however, the related copy of the software may be terminated and its storage released to the EDX supervisor, the spokesman noted.

Sorting is easily handled, he added. The sort feature builds an index with the desired sort key, which can be specified at runtime. The index can then be read sequentially to process the file in the sequence desired.

The package has limits, the spokesman acknowledged. It can handle files only up to 32K records long and the records can have a maximum of 256 bytes.

Each copy of the software, including all of its internal buffers, will occupy approximately 4K bytes of main memory.

A single machine license is available for $500 from The Systems Guild, Inc., 103 Westlake Drive, Thornwood, N.Y. 10594.

APL Ready For Z80s

SAN ANTONIO, Texas — For many applications, the power of APL/Z80, an APL interpreter for Z80 microcomputers, is comparable to the power of APL on a large time-sharing computer, according to the interpreter's vendor, Vanguard Systems Corp.

Nearly all primitive APL functions and operators are implemented in APL/Z80, a spokesman claimed. Those primitives not present are "easily implemented" as defined APL functions, he added.

This implementation appears to support a 35K-byte workspace, slightly larger than the 32K bytes originally supported by IBM versions but much smaller than the workspaces provided by both IBM and some of the major time-sharing firms that feature APL.

APL/Z80 object code for Digital Group Z80 systems is available for immediate delivery. APL/Z80 running under the CPM operating system will be available later this fall, the spokesman said.

An APL/Z80 end-user object code license is available for $300 for each MPU.

OEM licenses are available for object code and source code, Vanguard said from 6812 San Pedro, San Antonio, Texas 78216.

"The Fortex fixed asset system is proven, concise, well documented... programs compiled, test system run within hours. An uncommon event."

Michael G. Morris
Financial Systems Officer
Virginia National Bank
Norfolk, Virginia

Mr. Morris calls it an uncommon event, but at Fortex it's merely our normal way of doing business. All Fortex software product systems are operational; they are production-proven systems; they are concise and fully documented.

All Fortex systems, fixed asset, credit or A/R; on line or batch are easy to set-up and install because they *are* operational systems. Refering to Virginia National Bankshares' purchase of Fortex PIMS, Mr. Morris stated, "...our data processing folks are much impressed with the concise, tested and well documented manner of the System. The material and information was so clear that the programs were compiled and the test system run within hours of receipt of the tape...an uncommon event."

But we realized our deepest sense of pride from what Mr. Morris describes as, "One of the most significant aspects of my dealing with Fortex...their excellent responsiveness to inquiries regarding use of the system, even in aspects for which it is not designed. This is again an uncommon occurrence in my experience."

When asked what he liked most about Fortex PIMS System, Mr. Morris stated, "to summarize, PIMS is: ☐ a concise, tested system with sound data processing integrity ☐ a well documented, user oriented system ☐ a system with flexibility for implementation ☐ a product from a company which has obvious pride. So, when your priorities dictate a new software package, call Fortex. We can provide you with a proven modular package that features ease of use, technical support, quick response, cost savings, DP efficiency and maximum maintainability.

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Users Report First Day Experiences

OMEGAMON Producing Dramatic Results

MARINA DEL REY, CA. — "Saved IPL's" — "solved response time slowdown" — "found hardware problems" are a small sample of accounts given by MVS users of OMEGAMON within 24 hours of installation.

OMEGAMON functions on its own requiring little or no training as reported by a site in TORONTO which stated that the day OMEGAMON was put in there wasn't enough time to give the third shift operators any instruction on its use.

Automatic Exception Analysis Saves IPL

In the early hours of the morning the OMEGAMON Exception Analysis started flashing on a CRT set up beside the master console. Using the 'English like' messages the operators were able to save an IPL!

An installation spokesman said "Traditionally, it has been difficult to have operators determine the exact cause of a problem and take steps to correct the situation. With OMEGAMON the operators are automatically warned of an impending difficulty and can usually make the necessary adjustments before any users are impacted."

From the East Coast of the U.S. comes another first day experience this time involving IMS. Within the first 30 minutes after OMEGAMON was installed, IMS response time seriously degraded. A quick look at the OMEGAMON Exception Analysis display showed why. OMEGAMON was warning that the IMS address space was locked out from the control unit assigned to the IMS log tape used for transaction recording to rebuild the data base in case of a catastrophic error. OMEGAMON displayed another job with a tape in a runaway situation on the same control unit which prohibited IMS from accessing the log tape. The user quickly corrected the condition and IMS started running again.

First Display Shows Answer

One of the most impressive displays of fast diagnosis took place at a West Coast manufacturer. Just as OMEGAMON started it flashed warnings of a dropped ready disk drive and noted several jobs that were waiting on it.

A number of installations have reported receiving warning messages on MSS (Mass Storage System) devices that have located hardware problems requiring vendor support.

Another story comes from the Midwest where a user was installing OMEGAMON at a branch location. (Installing OMEGAMON takes only 20 minutes — there are no hooks, no SVC's, or authorized requirements).

Finds CICS Response Problem

The user spokesman said "While reviewing the standard OMEGAMON displays, I spotted what seemed to be a problem with CICS. I called operations but they said everything looked fine — there was no response problem. Egged on by the flashing OMEGAMON display I called a CICS user and asked if there were any problems with CICS response. He said, 'Sure, we were just about to call to ask what was wrong!' I called operations back and told them about the problem. A simple change and response was back to normal."

OMEGAMON is available from Candle Corporation, 4676 Admiralty Way, Suite 401, Marina del Rey, California, 90291, Telephone (213) 821-2902.

Installations Missing RMF Data

NEW YORK.— A survey of MVS installations indicates that sites relying on RMF reports for decisions regarding system performance are frequently not receiving results expected from changes made through use of RMF data.

Reasons have been traced to five sources:

- Improper calculations and use of wrong data in reports
- Analysis of items that have little or no effect on performance
- Incomplete understanding of the value of RMF data
- Erroneous belief that RMF data is accurate
- Relying on RMF as the only source of information

A copy of the complete survey is available free from Candle Corporation at 4676 Admiralty Way, Suite 401, Marina del Rey, California 90291.

MVS Seminars for Operators

Candle Corporation has announced a series of free seminars directed at operations personnel using IBM's MVS operating system. Subjects will include basic monitoring needed by operators, monitoring methods, enqueues and reserves. Case studies will also be discussed.

A seminar schedule is published in the October 16 and October 23 issues of Computerworld. For more information contact Candle Corporation at (213) 821-2902.

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Batch:

Why was response slow between 2:30—3:00? lousy

Why did user TS0013 have poor response time between 11:00 and 12:00?

Operations:

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'Plan IV:MVS' Enhanced

PHOENIX — Release 5 of the Plan IV:MVS systems management package from Capex Corp., available now, offers expanded analytical reporting and graphing capabilities, resulting in increased information at the analytical level for managing overall MVS performance, according to a Capex spokesman.

Service Objective Graphs will furnish users of IBM's most sophisticated operating system with one graph for each active objective observed. The graphs plot the actual service received by objective and, for ease of reference, superimpose the user-defined service objective over the actual service observed, the spokesman explained.

This feature will clearly show the overall impact that IPS specifications are having on the MVS System Resource Manager, he noted.

The overall tuning of MVS is also enhanced with the addition of the Domain Summary Report, the spokesman said, adding that this report will highlight service consumption for each active domain defined to the system.

Several other distribution graphs have been added to the output of Plan IV:MVS to assist in the tuning of IPS, the balancing of workloads and other factors in MVS resource management, according to Capex.

The updated package is available for $15,000 or $700/mo from Capex headquarters at 2613 N. Third St., Phoenix, Ariz. 85004.

Encyclopedia Update Lists 2,000 Information Sources

DETROIT — Like its predecessors, the third edition of the *Encyclopedia of Information Systems and Services* (EISS), published by Gale Research Co., is intended to be a comprehensive guide to the "information marketplace": to buyers and sellers and to the products and services they provide.

The organizations listed in this 1,000-page hardcover book include computer service companies, publishers, libraries, professional societies and government agencies, as well as research organizations, information centers, micrographic firms, clearinghouses, consultants and "others."

Services covered include data base publishing and vending, time-sharing, selective dissemination of information, information on demand and retrospective search services.

Data collection and analysis, computerized text editing, networking, research, micrographic storage and retrieval are also included, according to a spokesman.

Not Software Directory

EISS is not a software directory that lists packages and their vendors. Also excluded are printed commercial and legal services, academic and special libraries with traditional reference services only, public information offices, computer and micrographic hardware manufacturers and distributors, the spokesman said.

There are more than 2,000 entries in this edition, he continued, but — returning to the negative — these do not include general-purpose data management systems, conventional indexing and abstracting services, libraries with minimal automation activities and network participants with special services of their own.

The book costs $95. Supplements — the first is scheduled for release in March — cost $60 each, Gale said from Book Tower, Detroit, Mich. 48226.

'Map/3000' Aids Manufacturers

LONG BEACH, Calif. — Data Systems for Industry, Inc. (DS/I) has released a manufacturing-oriented software package for Hewlett-Packard Co.'s HP3000 large-end minicomputer that is said to be an integrated extension of HP's standard MFG/3000 software.

Map/3000 is implemented in Cobol, requires 120M bytes of disk storage and two magnetic tape drives and operates with a minimum of 256K bytes of main memory, according to a DSI spokesman.

The package is broken up into separate application modules and utilizes HP's data base management system, Image, for on-line terminal transaction processing. The system performs batch processing functions via keyed sequential access methods (Ksam), the spokesman said.

The software's modules support order entry, master scheduling, shop floor control, capacity planning, job costing, physical inventory processing and finished good inventory extensions in addition to HP's MFG applications of engineering and data control, inventory and order status and net material requirements planning, the spokesman noted.

The HP MFG/3000 system, which can be purchased from DSI, costs $15,000. The Map/3000 extensions cost $5,000 to $15,000 and are warranteed for the first year; after the first year, optional maintenance plans are priced from $50 to $150/mo except for the payroll program, which costs $200/mo.

Documentation and manuals are supplied with each module and training is available at a cost of $35/hour, DSI said from 3450 E. Spring St., Long Beach, Calif. 90806.

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Revised and expanded reports that include many new systems and models for 1978

All About 289 Small Business Computers Report M11-050-201. This comprehensive report is designed to help you select and apply low-cost business data processing systems. The characteristics and prices of 289 current systems from over 81 vendors are reported in detailed comparison charts. Selected from *Datapro 70*. Includes user ratings. $12.

All About 203 Minicomputers Report M11-050-101. This comprehensive report is designed to aid you in understanding the rapidly proliferating minicomputers and selecting the one that can best satisfy your requirements. You'll find detailed comparison charts covering the characteristics of 203 current minicomputers from 61 manufacturers. Selected from *Datapro 70*. Includes user ratings. $12

All About 146 Microcomputers Report M09-050-201. This 37-page report features detailed comparison charts that describe characteristics and pricing of current microcomputers from 54 vendors, plus new information on development systems and kits. Selected from *Datapro Reports on Minicomputers*. $12.

All About 109 Microprocessors Report M09-050-101. This completely revised 28-page report details characteristics of 109 current microprocessors from 25 manufacturers. You'll also find straightforward guidelines to help you understand and apply these compact, low-cost CPU's. Selected from *Datapro Reports on Minicomputers*. $12.

User Ratings of Proprietary Software Report 70E-010-40. This 18-page report contains the results of *Datapro's* fifth annual survey of proprietary software users, conducted in cooperation with *Datamation*. You'll find extensive tables showing how thousands of users rated nearly 200 individual packages, plus financial insights and the 1977 Software Honor Roll. Selected from *Datapro 70*. Includes user ratings. $12.

A Buyer's Guide to Data Base Management Systems Report 70E-010-61. This 36-page report presents useful guidelines to aid you in preparing, evaluating and selecting a data base management system. It compares the key characteristics of major systems and provides an in-depth evaluation of these systems. ADABAS, IDMS, IMS, SYSTEM 2000, TOTAL and DATACOM/DB. Selected from *Datapro 70*. $12.

All About 135 Batch/RJE Terminals. Report 70D-010-25. The path to high-volume transmission and reception of data at locations remote from your computer center is a confusing one. This 40-page comprehensive report provides detailed specifications of 135 remote batch terminals from 49 vendors, presents the results of an extensive user survey covering nearly 2,000 installed terminals, and offers practical guidelines for selecting a batch terminal that will meet your specific needs. Selected from *Datapro 70*. Includes user ratings. $12

All About 261 Alphanumeric Display Terminals. Report 70D-010-15. This comprehensive 70-page report provides detailed specifications of 261 alphanumeric display terminals from 88 vendors, presents the results of an extensive user survey covering more than 20,000 terminals, and offers guidelines for selecting a display terminal to meet your specific needs. Selected from *Datapro 70*. Includes user ratings. $12.

All About Data Communications Facilities. Report 70G-100-01. This unique 29-page report summarizes the communications facilities and rate structures for interstate data transmission over the public telephone network, private lines, TWX/Telex, satellite channels, and packet switching networks. You'll also find the results of a survey of user experience with about 12,000 communications links. Selected from *Datapro 70*. Includes user ratings. $12.

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All About 188 Minicomputer Disk Storage Units Report M13-100-201 This 46-page report provides minicomputer users and suppliers with a comprehensive survey of 188 disk storage units. The comparison charts describe the current product lines of 37 suppliers, and the accompanying text offers the reader an enlightening guide for evaluating disk and drum storage performance. Selected from *Datapro Reports on Minicomputers*. $12.

All About 149 Teleprinter Terminals Report 70D-010-21. This 38-page report provides detailed specifications of 149 teleprinter-style communications terminals from 53 vendors, presents the results of an extensive user survey covering more than 18,500 installed terminals, and provides guidance in selecting the most suitable terminals for your needs. Selected from *Datapro 70*. Includes user ratings. $12.

All About 300 Modems Report 70G-500-01. Data communications users can select from an overwhelming variety of modems offered by dozens of independent vendors and by the telephone companies. This in-depth, 52-page report summarizes the characteristics of more than 300 current modems from 47 suppliers, provides useful selection guidance, and includes a unique survey of users' experience with over 11,000 modems. Selected from *Datapro 70*. Includes user ratings. $12.

All About 100 Word Processors Report S13-040-101. This comprehensive 82-page survey summarizes the characteristics of over 100 models of automatic typing and text editing systems from 50 vendors. Detailed comparison charts describe each model's basic configuration, pricing, storage medium and capacity, editing features, printer characteristics and much more. Selected from *Datapro Reports on Office Systems*. Special Price: $15.

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Tucson Builds On-Line System

'Pesos' Saves Dinero by Inventory Control

TUCSON, Ariz. — According to Tucson City Manager Joel D. Valdez, responsible financial management involves much more than the traditional concerns with such matters as a city's investment program, bonding capacity, debt service management and budgeting strategies.

"For example, during the past two years we have developed and implemented a computer-based purchasing and inventory control system which has brought about a $750,000 reduction in the value of inventory in our city's seven stores. Those dollars can now be put to work in areas where they are badly needed, such as for improved police or fire protection, without additional taxation," Valdez noted.

With a population of 350,000 and more than 500,000 in the surrounding metropolitan area, Tucson has some unique purchasing and inventory problems because it is the largest city in the world which depends entirely on an underground water supply.

The city owns and operates the water utility and supplies water to the entire metropolitan area from approximately 300 wells, some of which are located many miles from town. The water department, therefore, must maintain an extensive inventory of pumps, meters, pipes, valves, fittings and other items to keep the wells and the distribution system operating at peak efficiency.

Additionally, the city manages public housing, which means still another unique category of items must be bought and inventoried for repair and maintenance of the housing units.

Recently Automated

Although the city has had a centralized DP operation for many years, prior to early 1975 the inventory control function was completely manual.

"At the time, there were about 10,000 line items warehoused in our city stores. With the volume of receipts and issues growing constantly, it was virtually impossible to keep the card file up to date," Valdez recalled. The result was that items could be out of stock for several weeks before the buyers knew it.

To avoid stock-out situations, most buyers had a tendency to overbuy, resulting in many dollars being tied up in excessive inventory.

When Valdez became city manager in early 1974, he began improving the efficiency of all city departments through the development of advanced DP systems. He upgraded computer services to a major department, headed by a director who reports directly to the city manager. Previously, this operation was a function of the City Finance Department.

The purchasing Electronic System for Operating Services (Pesos) is one of several systems the department developed since 1974. "However, I consider it a cornerstone in what is becoming a very effective financial management system," Valdez said.

The city has continually upgraded its DP hardware. Pesos and other programs now run on a 1.5M-byte 370/158 with 12 Model 3350 disk drives, associated tape drives, high-speed printers and other peripherals. System software includes DOS/VS which runs under VM/370, Vsam for file handling and CICS for on-line support.

Three IBM 3270 CRT terminals and a 3287 line printer, located in the purchasing department at City Hall are dedicated to Pesos. At the central stores office, several miles away, there is an additional terminal and line printer, plus a dual-station IBM 3742 data entry unit.

Development of Pesos, which extended over a period of 18 months, was accomplished in close cooperation with the purchasing department — the primary user — as well as with major operating entities impacted by the system, such as accounting, the water utility, the fire department and the operations department.

"We took the systems approach in developing Pesos," Richard A. Cronican, director of computer services, explained. "We first met with all users and defined the major problem which needed solving. Then we had the users prioritize their problems, calling for a great deal of interdepartmental cooperation.

"We feel that much of the success of our information systems has resulted from this type of user involvement right from the start," he said. "For example, during the development of Pesos, the assistant city purchasing agent, Wayne A. Casper, devoted more than half of his time to working with our systems development staff."

The backbone of Pesos, according to Cronican, is an extremely flexible data base with segmented data files that provide for file independence and facilitate on line data collection as well as update and inquiry capabilities.

In addition to basic identifying information on each of approximately 16,000 items, the data files contain current purchase order information, complete vendor records and cost and usage factors for calculating economical order quantities, including a three-year usage history and a purchasing/price history covering the last 10 buys on every item of inventory.

(Continued on Page 34)

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Easing the LTA Bind

CHESTNUT HILL, Mass. — Described as release-independent and capable of supporting IBM DOS/VS systems with as many as 15 partitions, CFS, Inc.'s Multiple Transient Support (CFSMTS) package enhances operations by providing more than one transient area at a time.

CFSMTS provides a unique Logical Transient Area (LTA) for each problem program partition as well as a separate LTA for the system's Attention routines. This means each program can concurrently execute code that requires an LTA, whereas it formerly had to run serially through a single LTA, a spokeswoman explained.

The package provides a dynamic classification facility to control concurrent usage of $$B transients that are dependent on a single resource, but the user may also classify his own or any other transients, she added.

The software is said to accumulate statistics and provide, on demand, a report showing any overlap that has been gained.

A summary of elapsed savings is also calculated both in terms of time saved and its percentage of the entire processing cycle, she said.

CFSMTS is available for a one-time fee of $4,275, for an annual fee of $1,425 or for $130/mo, she concluded from Suite 608, 1330 Boylston St., Chestnut Hill, Mass. 02167.

Tucson Controls Inventory By Using On-Line 'Pesos'

(Continued from Page 33)

Most primary functions of Pesos are handled on-line. For example, clerical staff enters purchase orders directly to the system via a terminal. Receiving is also an on-line procedure.

The stock-issue cycle is the only procedure that is not on-line. It was determined by the purchasing department that a greater volume of issue information could be captured in a given period of time using off-line key-to-diskette data entry and batch processing.

Physical Inventory Eased

Pesos also facilitates the taking of the physical inventory at the seven stores. Because of limited manpower, Tucson uses the cycle inventory method, where a predetermined number of items is counted daily.

Each day the store determines the number of line items to be counted; on instructions entered through a terminal, the system provides a worksheet list of those items on the line printer in the warehouse.

The person doing the inventory count simply writes in the quantity of each item on the form, and these quantities are then entered through the terminal. The system compares the actual quantities with those in the inventory file and prints an exception report listing all items that do not match.

This list is used for a recount the following day. On those items that still do not match, Pesos produces a report which details all transactions for those stock items since the last inventory count. This report helps to determine the cause of an imbalance.

On a quarterly basis, Pesos recalculates the economical order quantity for every line item. Whenever the on-hand stock of an item reaches its established economical order quantity, the system produces a buyer action report, providing a three-year cumulative history on issues and purchases, plus vendor/cost statistics and other information needed to make the final purchasing decision.

The system also generates other reports for both buyers and purchasing management. These are available either through on-line inquiry or in hard copy.

The purchasing department presently issues some 12,000 purchase orders a year, representing an annual expenditure of over $45 million. A spokesman there said, "I would hate to think of trying to handle this volume of work without Pesos. By now, we would have to add several more people in both purchasing and inventory control, and costs would rise to an intolerably high level."

Seminars Planned For DP Neophytes

DELRAN, N.J. — Data Processing: An Introduction to Concepts and Systems, a technically oriented three-day seminar for the newcomer to DP, is being offered by Datapro Research Corp. this fall.

In addition to a session in Washington, D.C., starting today, the $485 seminar will be held in Chicago next week, in San Francisco in November and in New York in December, the company said from 1805 Underwood Blvd., Delran, N.J. 08075.

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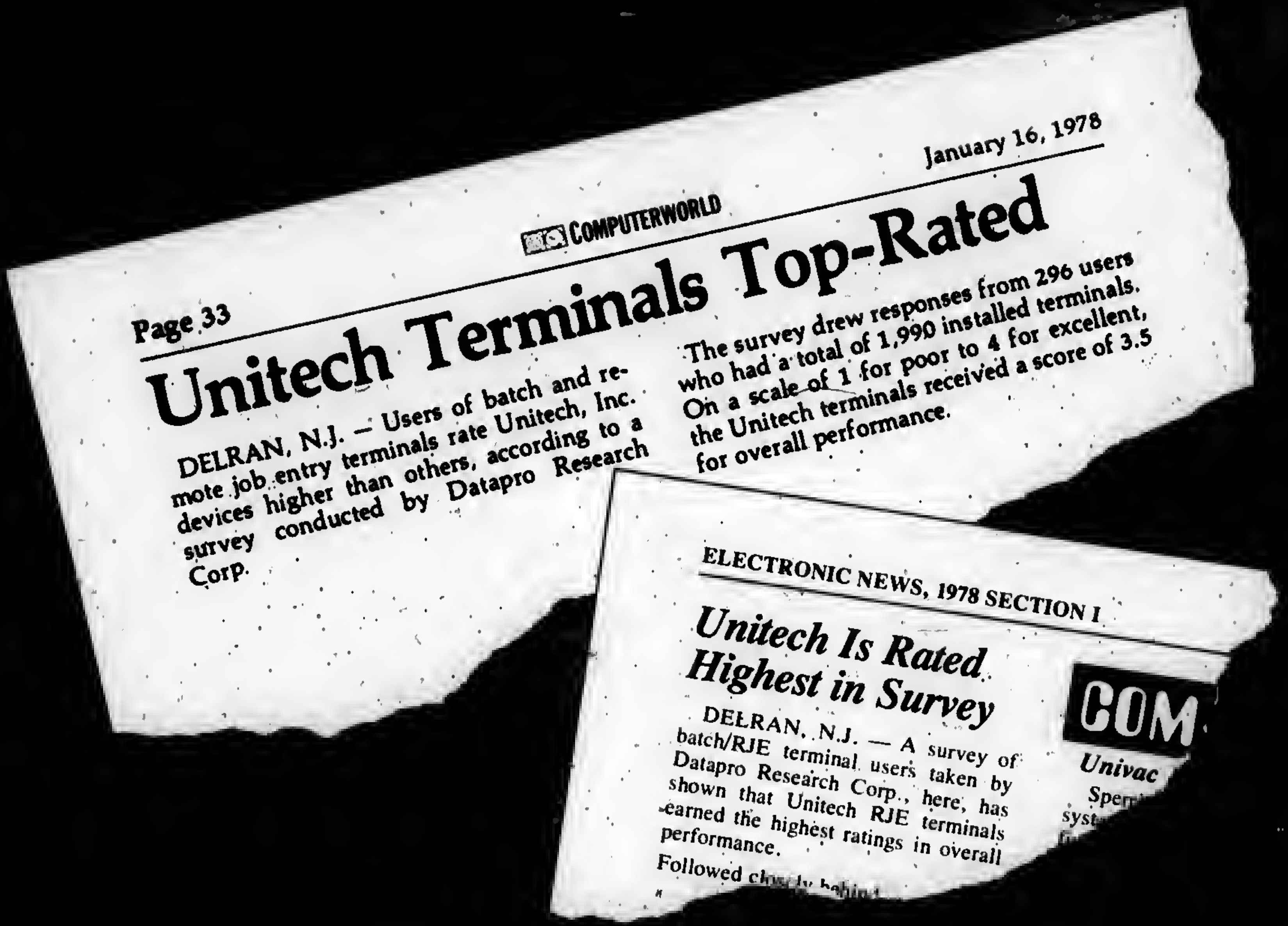

Page 33 COMPUTERWORLD January 16, 1978

Unitech Terminals Top-Rated

DELRAN, N.J. — Users of batch and remote job entry terminals rate Unitech, Inc. devices higher than others, according to a survey conducted by Datapro Research Corp.

The survey drew responses from 296 users who had a total of 1,990 installed terminals. On a scale of 1 for poor to 4 for excellent, the Unitech terminals received a score of 3.5 for overall performance.

ELECTRONIC NEWS, 1978 SECTION I

Unitech Is Rated Highest in Survey

DELRAN, N.J. — A survey of batch/RJE terminal users taken by Datapro Research Corp., here, has shown that Unitech RJE terminals earned the highest ratings in overall performance.

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'Future Shock' Seen Coming in Data Base Use

Data Base Corner

By Stephen L. Robinson
Special to CW

Those of us who have read Toffler's *Future Shock*, or other analyses of today's society, are aware that one of the major problems we face is that both the first *and* second derivatives of change are positive. That is, not only is the velocity, the rate of change, positive; but the acceleration, the rate of change of change, is positive.

In DP terms, this means we can expect the gaps between hardware and software generations to narrow. In order to insulate ourselves against such a change, we seek concepts that will span implementation variations.

Data base systems are one such concept. They incorporate a philosophy of data organization quite different from hardware and software.

Still, they are typically implemented using a particular software package on a particular computer.

Nonetheless, the concepts of shared data, of a corporate view of data, of data as a corporate resource, of controlled and synchronized data redundancy and of data administration are quite different from hardware and software considerations.

At least they *should* be, which brings us to the main subject of this column.

Threshold of Change

As IBM's 8100 [CW, Oct. 9] makes abundantly clear, we are on the threshold of a major change in DP hardware. Minis and micros are no longer suitable only for playing Star Wars at expositions.

They have arrived. They have compilers, data base packages, report writers, query languages and, unfortunately, even operating systems.

The major factor retarding their spread in the business world is not their capability but our ability to envision how to use them effectively. This will change, albeit somewhat slowly.

Unfortunately, one area that may suffer the most during this transition is the philosophy of data base systems.

As indicated in a recent Data Base Corner, data base system philosophy has, for the most part, not really come of age. It is too intimately linked with DP techniques, as opposed to data organizational considerations. Therefore, it would not be surprising if a major hardware change, with associated technical changes, had a significant impact on data base philosophy.

Nefarious Aspect

The nefarious aspect of mini/micro DP — from a data base system philosophy viewpoint — is that it returns control of data *processing* to the user. It is assumed the users will, therefore, endeavor to control their data *base* as well as their DP.

For example, if I am the manager of a distribution center for a manufacturing company, I probably currently rely on a corporate facility for the design and implementation of the requisite DP systems.

While I may indeed have my own intelligent terminals, or complete remote workstation, I am probably accessing data from a central source which keeps track of inventory and production at many sites.

The systems I run were probably developed remote from my site and probably represent a compromise of sorts on the running of similar — but admittedly different — distribution centers and production sites.

(Continued on Page 38)

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Seed Industry Helped

LITTLE ROCK, Ark. — Companies in the seed industry should be able to use a Cobol program developed and now offered by Arkansas Systems, Inc. (ASI) for seed inventory, management and bookkeeping on any of several small business systems, an ASI spokesman said.

The package prints and posts delivery tickets and confirmations of sales. It also posts — among other things — grain tickets or receipts to storage, purchase contracts, returns, move orders, sacking orders and changes in classification, he continued.

Invoices, statements and management reports are also part of the $15,000 package, which currently runs on a Burroughs Corp. B1700. ASI is at Suite 206, 8901 Kanis Road, Little Rock, Ark. 72205.

DPers Still Unable to Appreciate Impact of Distributed Data Bases

(Continued from Page 36)

Imagine now the brave new world of minis and micros. For less than $10,000 I may be able to configure a system with all the computer power necessary to manage my facility.

Using Basic, or another simple programming language, I discover I can write programs to generate precisely the information I require, not what some bright systems analyst in the corporate department thinks I require.

Flushed with success at my venture into decentralized DP, I begin to build my own data base. With some luck, I may shortly be able to cut the umbilical cord, or communication link, to the corporate computer facility.

I now go around to computer conferences bragging in six months, how I am saving X dollars per month in computer charges, how I am now the most efficient distribution center in the company, ad nauseum.

Looks good, you say. How can anyone object to this utopia? Let's stay with the company awhile. During the next year, several sites "decentralize" themselves.

Shortly thereafter, the company's market share begins to dwindle; two years later it verges on bankruptcy. Why? Corporate decision makers have no information with which to work.

All the little data czars have cut off the supply of data. A simple task, such as assessing the short- or long-term supply of a particular product, which requires access to data from several distribution and production sites, becomes impossible.

Clearly, distributed, not decentralized, DP and data bases are needed.

Bleak Future

I believe that data base is in a rough road in the early days of minis and micros. This is primarily because I believe we will actually be seeing mostly decentralized, rather than distributed, DP and data bases.

Distributed processing and data bases require extensive planning; decentralization can be accomplished quickly, if not always easily.

Decentralization restores "power to the people," a popilar byword these days' distributed processing and data bases require conformity to a centrally developed set of policies, procedures, standards and so on. Properly developed, such rules can present minimal problems for each code in a distributed system.

Unfortunately, human nature being as contrary as it is, any constraints are often viewed as too many.

Thus, minis and micros are likely to have a detrimental effect on a company's transition to a data base system. But this is because there is a basic conflict between data base system philosophy and decentralized DP and decentralized data bases.

Those organizations that take the time and expend the resources to study minis and micros, examine their DP requirements and develop corporate data models and data base system plans will be in a position to reap the benefits of our changing technology.

Robinson is an independent consultant, operating as S.L. Robinson & Associates of Morrisville, Pa.

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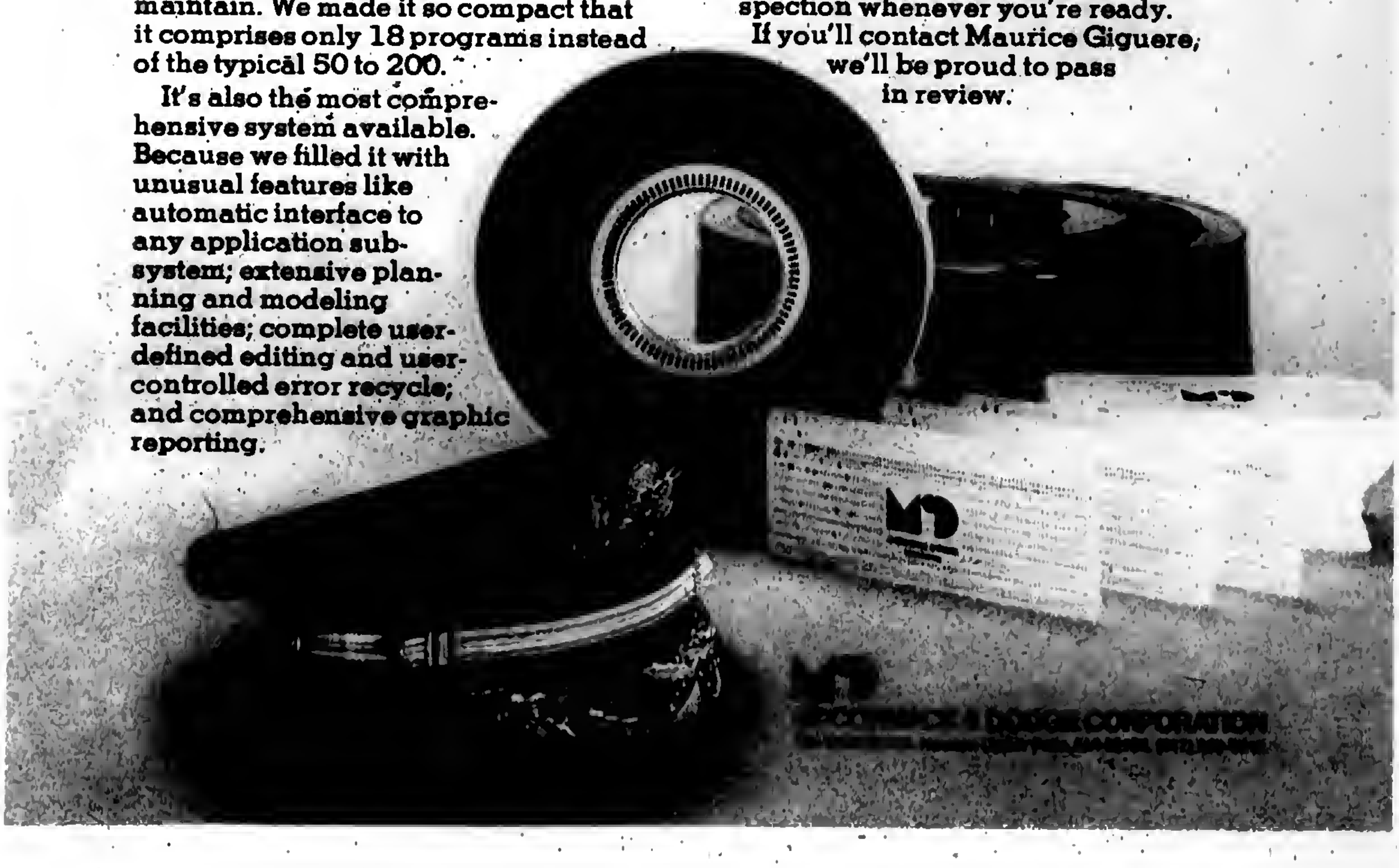

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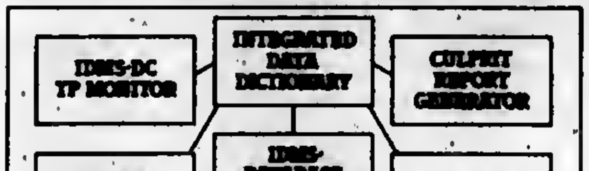

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PL/65 LANGUAGE STATEMENTS

Declaration

DECLARE
DEFINE
DATA
Comment

Assignment

Single Byte Move
Multiple Byte Move

Imperative

SHIFT
ROTATE
CLEAR
SET
CODE
HALT
WAIT
STACK
UNSTACK
INC
INCW
DEC
DECW
PULSE

Specification

ENTRY
EXIT

Conditional

IF-THEN-ELSE
IF-THEN
BEGIN-END
CASE

Branching

GOTO
CALL
RETURN
RTI
BREAK

Looping

FOR-TO-BY
WHILE

ANAHEIM, Calif. — A high-level language described as resembling PL/I and Algol is available from Rockwell International for designers developing programs for the R6500 microprocessor family using either the System 65 development system or Digital Equipment Corp.'s PDP-11 minicomputer.

PL/65 is said to be "considerably easier" to use than assembly language or object code, thus increasing programmer productivity while reducing software development time and costs. The PL/65 compiler outputs source code to the System 65's resident assembler, according to a spokesman.

This two-tiered approach permits enhancing or debugging at the assembler level before object code is generated, he explained. In addition, PL/65 statements may be mixed with assembly language instructions for timing or code optimization, he noted.

The PL/65 language reportedly supports modular program design. Its general control structures for conditional or iterative looping allow the language to be used effectively in structured programs, the spokesman claimed.

Other Features

Other language features are said to include assignment, integer arithmetic, conditional execution, collective execution, linear array manipulation, data area declaration and array manipulation. Block structures, subscripts and parenthetical expressions are also supported, the spokesman asserted.

The language supports all 10 CPUs in the NMOS 6500 microprocessor and the compiler is available to System 65 users on a mini diskette. It costs $500 from Rockwell's Electronic Devices Division, 3310 Miraloma Ave., P.O. Box 3669, Anaheim, Calif. 92803.

For PDP-11 users, a PL/65 compiler, for $500, and a $600 Minmic cross-assembler, both of which run under RT-11, are available from Compas Microsystems, 224 S.E. 16th St., P.O. Box 687, Ames, Iowa 50010.

Financial Data Now on GE Net

ROCKVILLE, Md. — Multinational companies engaged in the time-critical business activity of international currency translation may be able to speed up and ease that process by means of a proprietary, on-line currency exchange data base available via General Electric Co.'s Mark III remote computing service.

Financial managers accessing the Currency Exchange Data Base can obtain daily currency exchange rates for 34 currencies in 32 countries, including bid and offer rates (New York market) and futures for one, three, six and 12 months over the past 90 trading days, a spokesman said.

Additional data is provided monthly for 46 currencies and yearly for 43 currencies. Daily data is obtained from the International Treasury Division of Marine Midland Bank. Monthly and annual data is obtained from the International Monetary fund, he added.

Financiers can use that information in conjunction with GE's financial analysis and data base management programs. These programs were designed to give business money managers the ability to consolidate international accounting or budget data and improve their methods for business forecasting and financial planning.

Other management functions, such as cash consolidation, accounting, inventory control, order service and sales/marketing analysis systems are also available over the Mark III computing network. Technical support services for customers as well as customized programming services can be obtained from members of GE's programming staff, the spokesman continued.

Mark III service offers multinational firms a teleprocessing network that now reaches 22 countries from three GE computing centers — in Cleveland; Rockville, Md; and Amsterdam, The Netherlands.

The operation is based at 401 N. Washington, Rockville, Md. 20850.

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Enhances Terminal-Host Links

Burroughs Unveils DDP Architecture

DETROIT — Burroughs Corp. has introduced a network architecture designed to enhance the interaction of terminals with host CPUs in a network environment as well as to facilitate a move into distributed data processing (DDP).

With the Burroughs Network Architecture (BNA), "computers and terminals can be granted access to data bases throughout a network, job tasks and information files can be transferred from one point to another and [DP] resources available anywhere in a network can be shared by participants, regardless of the distance between them," the vendor claimed.

BNA links multiple host computer systems so information can be exchanged throughout a complex user organization, Burroughs said. This will provide smaller sites with resources traditionally concentrated in administrative headquarters, marketing offices, production plants or engineering centers, a spokesman added.

Burroughs B1700 and B1800 series minicomputers as well as the vendor's larger computer systems can serve as host processors in a BNA network, he noted, and virtually any other Burroughs CPU can serve such an environment — as a peripherals controller, for example.

The architecture is said to allow an "easy upgrade from existing Burroughs communicaitons networks configurations. Users need not acquire "specialized equipment" to effect such a transition, Burroughs said.

Logical, Dynamic Linkage

According to the vendor, BNA links individual network elements on a logical and dynamic basis rather than on an arbitrary, fixed basis.

"The result is a choice of interconnections for linking any element with another and for altering these linkages to fit changes in data communications line availabilities and local user needs," it said.

A bank with nationwide or international operations could establish a BNA-based DDP system in which individual host CPUs — each with its own data base — could serve customers in specified geographic areas, Burroughs said. The bank could provide its officers with up-to-date financial information to the extent permitted by law and could serve a customer at any branch office in any area.

A manufacturer could link host computers and terminals located at its plants to provide a constant exchange of inventory, production and delivery data, the vendor continued.

Similarly, users at all points in a BNA network could have access via their respective host CPUs to scientific computation or econometric modeling services otherwise limited to users at relatively few locations. By connecting all host CPUs, a business or government agency could acquire around-the-clock DP support, even if one or more local host sites were temporarily out of service.

"The necessary interconnection between host computers can be derived from whatever combination of dedicated leased lines or dial-up lines — including those linked by satellites [or] ground-base stations — provides the desired level of communications service at least cost," Burroughs said.

(Continued on Page 42)

Merger of Infoswitch, ARC Among Debuts at TCA Show

By Jeffry Beeler
CW Staff

SAN DIEGO — An estimated 2,500 visitors to the recent Tele-Communications Association (TCA) conference here probably got a glimpse into the telecommunications future when Datapoint Corp. used the five-day event to introduce an offering that reputedly weds its Infoswitch product line and its Attached Resource Computer (ARC) system.

Datapoint officials touted Infoswitch/ARC as a precursor of the much ballyhooed "office of the future" in which DP, communications, word processing, image processing and other allied disciplines will converge in an integrated system.

They also described the combination product as the first in an imminent wave of offerings that will provide workable alternatives to Bell's communications management techniques.

But although Infoswitch/ARC almost certainly highlighted the hardware exhibit portion of the TCA conference, the system was not the only product at the 16th annual gathering to grab the attention of telecommunications equipment users.

Some of the other offerings announced by the show's 96 exhibitors included three modems, a network diagnostic controller and a network control module from Racal-Milgo Information Systems, Inc.; a microprocessor-based modem and two statistical time-division multiplexors from General Datacomm Industries, Inc.; an intelligent network processor and a modem from Co-

(Continued on Page 48)

Public Net for Hawaiian Islands Expected to Save Users 30%

By Ronald A. Frank
CW Staff

HONOLULU — A public data network intended to save intrastate users as much as 30% over private-line rates is scheduled to begin operating in Hawaii by the end of this year.

The Data Switched Network (Dasnet II) will link the major Hawaiian islands with 56k bit/sec, data-only microwave facilities of the Hawaiian Telephone Co., according to David Horton, the firm's director of computer communications development.

Dasnet II will eventually be connected with Dasnet I, which provides interstate public data service, including dial-in access to the Telenet packet-switched network.

Both dial-up and private-line services will be offered. Short-haul modems will be employed by users located near Hawaiian Telephone facilities, and conventional data sets will be utilized for longer distance applications, according to Alan H. Okinaka, a project engineer with the phone company.

Services will be provided for users with

(Continued on Page 49)

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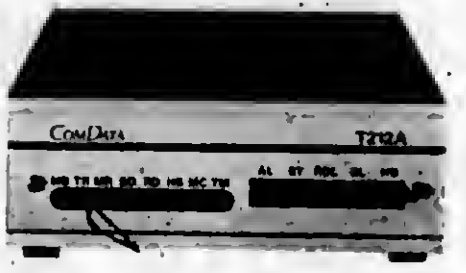

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Farmers' Net Means New Verse for Old Song

Special to CW

BLOOMINGTON, Ill. — According to the song, Old MacDonald had a farm with chickens, horses and pigs.

Now, however, that song might need another verse, because Old MacDonald didn't have a terminal.

Located in 14 fuel and fertilizer dispatch sites in remote farming areas of three Midwestern states, terminals are helping FS Services, Inc., a regional farm cooperative, create invoices three times faster. The terminals have also eliminated serious billing disputes caused by the inefficiencies of its previous system, the user said.

FS tried a network of telecopiers after finding that its origional manual mailing system delayed the routing of invoices to accounts receivable by more than one week. "Because of transmission problems and poor print quality, however, that was a disaster from Day One," according to the cooperative's order and billing control manager, Gary Garrett.

FS next thought of linking terminals directly to its Honeywell, Inc. Model 636 mainframe to allow on-line data entry. But the cooperative decided that its low volume of applications did not warrant the hardware and software development costs such a system expansion would entail.

FS finally decided to install a network of Mohawk Data Corp. Sciences (MDS) Series 21/40 terminals. According to the network scheme, billing data is keyed onto diskettes at remote "dispatch sites" during each day and then transmitted via telephone lines to a central Series 21 site at FS headquarters.

There the data is again recorded on diskettes and then copied onto magnetic tape for storage on the Model 636.

Minimal Programming

Programming required minimal effort and was completed in about a month, Garrett said. In addition, "since the system is off-line with all the intelligence we need at the source, communications costs are kept to a minimum," he noted.

Garrett explained that fuel and fertilizer sales are received by 14 dispatch stations from FS member cooperatives. On-line systems were considered as an alternative to Series 21, but quickly eliminated because of prohibitive hardware and communications costs.

"The most cost-effective way for us to go on-line to the fuel depots was to add onto our present system," Garrett said. "We considered that alternative, but each site would have cost over $500 a month to maintain. The hardware was too expensive and the full-day telephone connections on-line systems require were not practical for our low-volume applications.

"In addition," he pointed out, "the dispatch sites are in very remote areas and telephone services from those locations is expensive and unreliable."

With the manual system, "there was no uniform procedure," Garrett said. "Drivers turned in bills of lading sporadically because it wasn't always necessary for them to go to the depot daily.

"And in many cases the

(Continued on Page 52)

Burroughs Unveils Architecture

(Continued from Page 41)

A specific protocol is featured that allows a host CPU user to modify data kept at other CPUs in the network or to transfer data from the host to the other CPUs.

Assigning these responsibilities to host CPUs eliminates the need for duplicating them at subordinate levels in the network or for installing specialized processors for this purpose, the spokesman explained.

The system-level programming anticipated for BNA networks follows Burroughs' policy of independence between user, application programs and the operating environment, the vendor said.

The Burroughs systems software said to form the "operating framework" for Burroughs networking includes the Master Control Program (MCP) and such applications development aids as the network Definition Language (NDL) and Message Control System (MCS).

"To protect the user's present investment in programming," the vendor has devised BNA extensions to its systems software, allowing Cobol, PL/I, Algol and Fortran applications programs to access the network's "full resources."

"Without change to their basic compositions, existing programs have access to the files, data bases and other resources of host computers throughout the network," Burroughs said.

Network Services

A "network services" feature joins host CPUs on a point-to-point basis via the Burroughs Data Link Control bit-oriented procedures and interfaces the hosts to X.25-standard commercial packet-switching services.

Systems in a BNA network can be programmed to communicate with non-Burroughs systems and networks through the use of presently available Burroughs NDL and MCS capabilities.

The network services feature permits intermediate hosts to pass along messages intended for other hosts in the network. Tables are maintained to provide alternate routings in the event a communications line, network component or host computer along with the primary path is not functional.

This feature also allows message segmentation and reassembly, message integrity between two hosts and coordination of messages and responses in transaction-oriented and conversational processes, the vendor added.

BNA network security was called the responsibility of each host system. Requests for data from other points in the network are subject to the same degree of security that the receiving host imposes on requests from its own local networks.

Security is thus thought to remain under local control, and changes in the security levels of local records and files can reportedly be made without altering control mechanisms elsewhere.

The BNA is scheduled for availability beginning in the fourth quarter of 1979.

"Licensees have a choice of an unlimited time plan or two limited time plans," Burroughs stated. "Under the unlimited time plan, full BNA capabilities will be available for an initial payment of $6,000 to $21,000 and an annual license fee of $600 to $2,100, depending on the host system."

Monthly license fees will range from $200 to $700 under the three-year limited time plan or from $192 to $672 under the five-year plan, the vendor said. Each computer system is licensed separately.

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VT100 CRT DECscope	1,595	153	81	56
TI 745 Portable	1,875	175	94	65
TI 765 Bubble Mem.	2,995	285	152	99
TI 810 RO Printer	1,895	181	97	66
TI 820 KSR Terminal	2,395	229	122	84
QUME, Ltr. Qual. KSR	3,195	306	163	112
QUME, Ltr. Qual. RO	2,795	268	143	98
ADM 3A CRT	875	84	45	30
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HAZELTINE 1500 CRT	1,195	115	67	42
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Edutronics/McGraw-Hill and Structured Methods present The Structured Forum

The Structured Forum

Structured Methods and Edutronics/McGraw-Hill are pleased to be co-sponsoring the Structured Forum — a one-day review of the major structured design and development methodologies with special emphasis on the development of the human resources needed to install these new techniques effectively. Conducted between Thanksgiving and Christmas, the Forum will include an in-depth look at the differences, as well as the similarities, between the data flow and the data structure design approaches. In addition, the link between system design and database design methods will be explored.

To represent a broad cross-section of methods, we've invited representatives from the leading consulting/training organizations in the U. S. to present their own particular design orientation. We've also invited a local speaker in each of the 18 Forum cities to present a luncheon address on a timely topic related to software development.

The Dates

New York	Nov 28
Boston	Nov 29
Toronto	Nov 30
Detroit	Dec. 1
Chicago	Dec 4
Minneapolis	Dec 5
Seattle	Dec 6
San Francisco	Dec 7
Los Angeles	Dec 8
Denver	Dec 11
Kansas City	Dec 12
Dallas	Dec 13
Houston	Dec 14
St. Louis	Dec 15
Atlanta	Dec 18
Columbus, OH	Dec 19
Wash., DC	Dec 20
Philadelphia	Dec 21

The Program

The agenda for the one-day Structured Forum will consist of presentations on:

- Warnier/Orr methodology by a representative of Langston, Kitch.
- Jackson Design methodology by a representative of Infotech International.
- Constantine/Myers/Yourdon methodology by a member of the Structured Methods staff.
- Database Design by a member of the staff of DBD Systems.
- Human Resource Development in a Data Processing Environment by a representative of Edutronics/McGraw-Hill.

Attendees will be provided with all Forum materials including the conference proceedings. A buffet lunch will be served and all attendees are welcome to join the speakers in informal conversation during a wine and cheese gathering following the presentations.

Registration

To register for the Structured Forum, or for any of our other courses, you can write or call collect. Registrations may be cancelled at any time up to the last business day prior to the first day of a course. Structured Methods does not impose any cancellation fee, provided the above condition has been met.

The fee for the Structured Forum is $175 and groups of three or more will receive a 10% discount. All attendees will receive a $100 credit which can be applied toward Structured Methods or Edutronics services or against a list of selections from the McGraw-Hill Computer Science Library.

To reach us by phone, you can call us collect at . . . 212 — 355-2520, or you can call us at one of our local numbers:

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PHOENIX	602 – 258 - 4464

New Courses

In addition to conducting the Structured Forum, Structured Methods is introducing four new courses this fall.

Reviews, Walkthroughs and Inspections will demonstrate that peer reviews improve product quality through discovery and elimination of errors. Participants will learn to communicate effectively with one another in the peer review environment, they will gain the knowledge necessary to conduct appropriate peer reviews during system development, and will become aware of potential problems and possible solutions.

Modern Systems Development - A User Perspective will help the non-technical business staff understand their role in systems analysis and throughout the systems development life cycle. Participants will be familiarized with the processes and tasks of the life cycle, and will be taught the documentation techniques and strategies of structured analysis.

Comparative Design Methodologies is a three-day course intended to increase your awareness of software design theories and practices through a comparison of Infotech/Jackson, Warnier/Orr, and Constantine/Myers/Yourdon design methodologies. Three instructors, each an expert in a different one of the methodologies, will be on hand to conduct the course.

Quality Assurance & Testing Workshop will teach the attendee how to integrate the testing function into the entire development life cycle, with special emphasis on the use of the cause and effect graphing technique to validate the completeness of the business requirements documentation and the code analysis technique to determine the impact of change on existing systems.

Seminar Schedule

COURSE	DAYS	FEE	OCTOBER 1978	NOVEMBER 1978
Reviews, Walkthroughs and Inspections	2	$325	5-6 Chicago	13-14 San Francisco
Modern System Development A User Perspective	2	$325	26-27 Washington, DC	2-3 Chicago
Comparative Design Methodologies	3	$575	25-27 Chicago	8-10 New York
Quality Assurance & Testing Workshop	5	$625	30-11/3 Boston	
Managing Systems Development A Structured Approach	2	$325	2-3 New York 5-6 Dallas 30-31 Chicago	20-21 Los Angeles 20-21 Kansas City 20-21 Cincinnati
Introduction to the Tools and Techniques of Structured Systems Development	1	$175	4 New York 4 Dallas	1 Chicago 22 Los Angeles 22 Kansas City 22 Cincinnati
Structured Design	3	$475	2-4 Phoenix 2-4 Atlanta 30-11/1 Denver 30-11/1 New York	6-8 Dallas 13-15 San Diego 27-29 Chicago
Structured Analysis	2	$325	5-6 Phoenix 5-6 Atlanta	2-3 Denver 2-3 New York 9-10 Dallas 16-17 San Diego 30-12/1 Chicago
Structured Analysis/Design Workshop	5	$625	9-13 Seattle 16-20 Boston 30-11/3 Kansas City	6-10 St. Louis 13-17 New York 27-12/1 Toronto
Structured Design/ Programming Workshop	5	$625	2-6 Minneapolis 9-13 Denver 16-20 Washington, DC 30-11/3 Cleveland	6-10 Phoenix 13-17 Boston 27-12/1 San Francisco
Structured Programming for COBOL Programmers	2	$325	12-13 Pittsburgh 12-13 Kansas City	20-21 New York
Structured Programming for PL/I Programmers	2	$325	25-26 Los Angeles	20-21 Chicago
Infotech/Jackson Design Technology Workshop	5½*	$800	9-14 San Francisco	13-18 Washington, DC
Data Base Package Analysis and Selection	3	$475	16-18 Chicago	6-8 Washington, DC
IMS/VS Data Base Design	5	$625	30-11/3 New York	27-12/1 Boston
IMS/VS Programming	5	$625	16-20 Seattle	6-10 Chicago
Data Base in a Distributed Processing Environment	2	$325	16-17 Dallas	6-7 Washington, DC
Data Base Management Systems for Minis A Comparative Analysis	3	$475	18-20 Dallas	8-10 Washington, DC
Systems Design in a Data Base Environment	2	$325	30-31 Boston	13-14 San Francisco
Designing Effective Data Bases	3	$475		1-3 Boston 15-17 San Francisco

*Monday through Friday, Saturday morning and three evenings during the week

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Course registrations for groups of 3 or more are entitled to a 10% discount

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Structured Analysis & Structured Design	$625
Data Base in a Distributed Processing Environment & Data Base Management Systems for Minis.	625
Systems Design in a Data Base Environment & Designing Effective Data Bases	625

In-House Policy

Structured Methods offers all of its courses on an in-house basis. Furthermore, we are able to tailor any course to meet a client's specific needs. For more information, call us. We will be happy to provide you with prices, references, and scheduling information:

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For Further Details See Page 34

Operates Alone or as Slave

Single-Board CPU Controls Communications

SANTA CLARA, Calif. – Intel Corp. has introduced the ISBC 544 intelligent communications controller, a single-board CPU designed to serve in a variety of data communications capacities.

The ISBC 544 can operate as a stand-alone communications controller, concentrator or message switcher to terminal and other peripheral controllers, the firm said, and can also act as an "intelligent slave" to other single-board systems.

With this product, equipment manufacturers can dedicate communications tasks to a single-board intelligent controller, rather than employ subsystems comprised of several conventional logic boards, the vendor stated.

As a stand-alone, "dumb" terminal handler, the ISBC 544 can reportedly be programmed to provide data link control and data buffering to each terminal and can also accommodate code conversions and interterminal protocol.

If the controller is used as a stand-alone system, its memory and I/O capabilities may be expanded and additional functions added using Intel-compatible expansion boards.

Memory capacity may be increased by adding user-specified combinations of random-access memory (RAM) and electronically programmable read-only memory boards. Multiple ISBC 544 boards may be included in a configuration where one ISBC 544 acts as a communications processor and the other boards serve as intelligent slaves, Intel noted.

As Intelligent Slave

As an intelligent slave, the product is said to incorporate on-board processing and dual-port memory capabilities to execute tasks that otherwise would be handled by the master processor. This approach is meant to free the master to perform other systems control and processing functions, thus simplifying systems software and reducing multiprocessing requirements.

On-board processing reportedly allows the intelligent slave to operate independently of the bus master. In this way, the ISBC 544 can locally control communications functions without accessing the system bus, the vendor continued, adding this minimizes the bus traffic devoted to communications, freeing the system bus for other system tasks.

The dual port RAM provides the interface between the ISBC 544 board and its master or masters, Intel said. The memory allows both the on-board microprocessor and the masters to access the same memory block and can be used to transfer command and status information between masters and slave.

The ISBC is a complete 8-bit CPU on a single 6.75-in. by 12-in. printed circuit board. Compatible with Intel's standard Multibus, the product contains four programmable synchronous/asynchronous serial I/O channels, an 8085A microprocessor, 16K bytes of dual port dynamic read/write memory and sockets for up to 8K bytes of read-only memory.

The device also includes 10 programmable parallel I/O lines compatible with the Bell 801 automatic calling unit, four programmable bit/sec rate selectors, three independent programmable interval timers/counters and 12 levels of programmable interrupt control.

The unit also features extended system bus addressing for system access in partitioning a 1M-byte address space, Intel said.

(Continued on Page 54)

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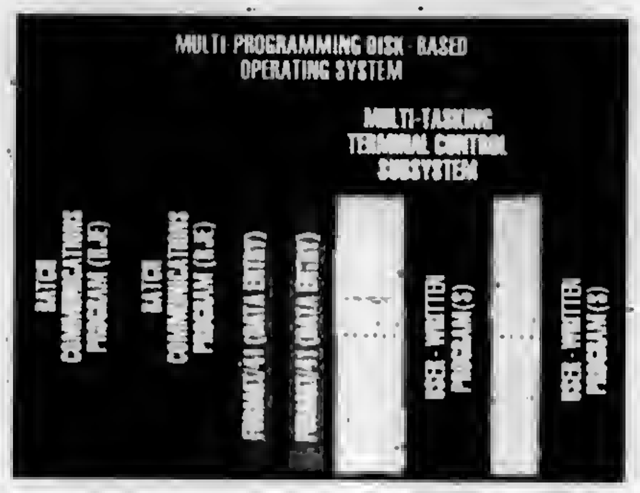
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Datapoint Shows Infoswitch/ARC at TCA

(Continued from Page 41)

dex Corp.; and three additional modems — two from Penril Corp. and the other from Paradyne Corp.

DP Resources Applied

Elaborating further on the implications of their latest product announcement, Datapoint officials claimed that by fusing Infoswitch and ARC into a single offering, the company has made one of the first concerted efforts to apply DP resources to the problems of telecommunications management.

Like an unaided Infoswitch system, the combination product provides software modules that automatically determine least-cost routes for outgoing long distance calls, account for long distance and local toll call charges, centrally control telecommunications functions in up to eight remote locations, equally distribute calls among multiple phones and prepare assorted management reports.

In addition, the system runs user-written software as well as programs like Datapoint's Network Optymizer and its Equipment Billing or Directory packages, according to a company official.

Depending on the configuration, the Infoswitch/ARC system costs $45,000 to $500,000 from Datapoint at 9725 Datapoint Drive, San Antonio, Texas 78284.

Racal-Milgo Debuts

Also at the conference, Racal-Milgo introduced its 24 LSI series modems, its loop modem series, the Com-Link III modem, Model 185 network diagnostic controller and NCM-7 network control module.

The 24 LSI modem series consists of the desk-top 24 LSI Mark II and the rack-mountable CS 24 LSI Mark II, both of which operate at 2,400 bit/sec over two-wire dial-up lines or four-wire, point-to-point and multipoint lines, a Racal-Milgo source said.

The company's Loop Modem series also consists of two members — the 1,200 bit/sec 12 LMS and the 2,400 bit/sec 24 LMS, both of which replace the IBM 3603 terminal access unit.

By contrast, the firm's other modem introduction, the Com-Link III, operates at 1,200 to 19.2k bit/sec over dedicated four-write metallic lines and transmits data up to 25 miles, the spokesman added.

Racal-Milgo's Model 185 network diagnostic controller remotely monitors, reconfigures and diagnoses IBM 3600-type loop systems, while the NCM-7 network control module allows users to monitor modem status from a remote site.

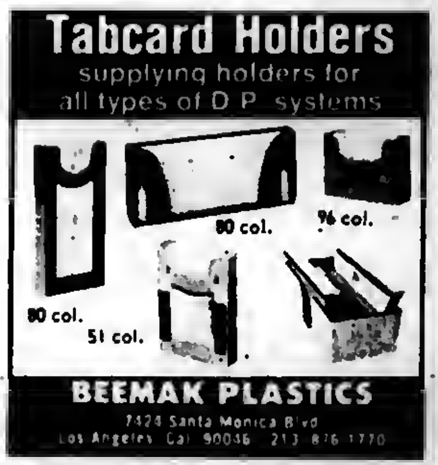
Depending on the features specified, the 24 LSI series costs $900 to $1,400; the Loop Modem series, about $2,000; the Model 185, about $10,000; the NCM-7, $1,300 to $1,500; and a basic Com-Link III, slightly less than $1,000.

Modem Unveilings

Some of the other modems introduced at the conference included Paradyne's LSI 2400A, which transmits up to 2,400 bit/sec in multipoint and point-to-point networks; Penril's 9600 data modem, which operates at up to 9,600 bit/sec in a full-duplex mode, and its 4800 DCMM, which operates synchronously at 4,800 bit/sec; and General Datacomm's GDC 208-9A microprocessor-based unit, which transmits up to 4,800 bit/sec over point-to-point or multipoint lines.

Penril's 9,600 bit/sec modem costs $6,500, while the 4,800 bit/sec model costs $2,900 for a standard version, $3,500 for a remote diagnostic version and $4,200 for a master diagnostic version.

Paradyne's LSI 2400A costs $1,100, while General Datacomm's GDC 208-9A, TDM 1240 and TDM 1241 are priced at $3,000, $1,500 and $3,500, respectively.



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First in the Nation

HONOLULU — The Hawaiian Telephone Co. has become the only U.S. phone company to provide interconnection with the Telenet Communications Corp. public packet-switched data network.

By installing a Terminal Interface Processor (TIP), local users can access by telephone any host CPU on Telenet, according to David Horton, director of computer communications development at Hawaiian Telephone.

The Telenet link to the mainland consists of two 9,600 bit/sec cable facilities, which will be upgraded as traffic grows. There are currently about 20 users from the tourist industry, universities, the state government, banks and other sectors, Horton said.

The TIP was purchased from Telenet to give the phone company additional capacity for other network services. While interconnection with Telenet may seem rather daring for a U.S. phone company, Horton said, his firm would consider connections with other public data nets — such as Tymnet — depending on user demands.

He also did not rule out links with comparable Bell System offerings, including the Advanced Communications Service.

Hawaiian Islands Linked With Public Network

(Continued from Page 41)

asynchronous terminals at speeds ranging from 110- to 1,200 bit/sec, while synchronous equipment will be supported at 2,400- through 9,600 bit/sec.

Although final tariffs have not yet been filed, Okinaka said a savings of up to 30% could be expected by some users. Intrastate users between the islands of Oahu and Maui, for example, now pay about $230/mo for 300 bit/sec private-line service. Dasnet II rates are expected to be nearly one-third less, Okinaka said.

Packet-Switching Possibility

Initially, Dasnet II will offer only circuit-switched service, according to Horton, who played a major role in implementing Bell Canada's packet-switched network, Datapac.

Central switching equipment at the network control center in Honolulu, however will be an M3200 hybrid system from Computer Transmission Corp. It can be upgraded to packet-switched operation in the future, Horton noted. Dasnet II will be a lower cost alternative for many communications users, but some will continue to require private lines, he added.

The network will accommodate all RS-232 compatible equipment, Western Electric Co. modems or comparable data sets and GTE communications products, he continued, noting that Hawaiian Telephone is a GTE affiliate.

Horton said the phone company will market a wide range of terminals for use on the network, including Lear-Siegler, Inc., General Electric Co. and Teletype Corp. models.

Real-time trouble reporting and on-line network reconfiguration will be undertaken to minimize downtime, Okinaka said. "Fully itemized" network billing and usage statistics will also be furnished when needed.

The time-division multiplexing equipment that will be installed at major island facilities is now being tested at the Honolulu center. After this phase, the multiplexing equipment will be installed at the remote sites for further testing.

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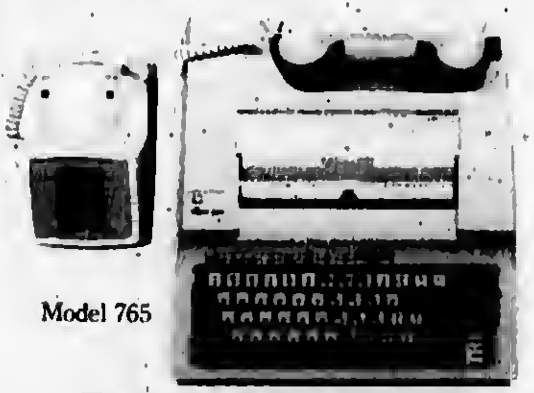

Model 765

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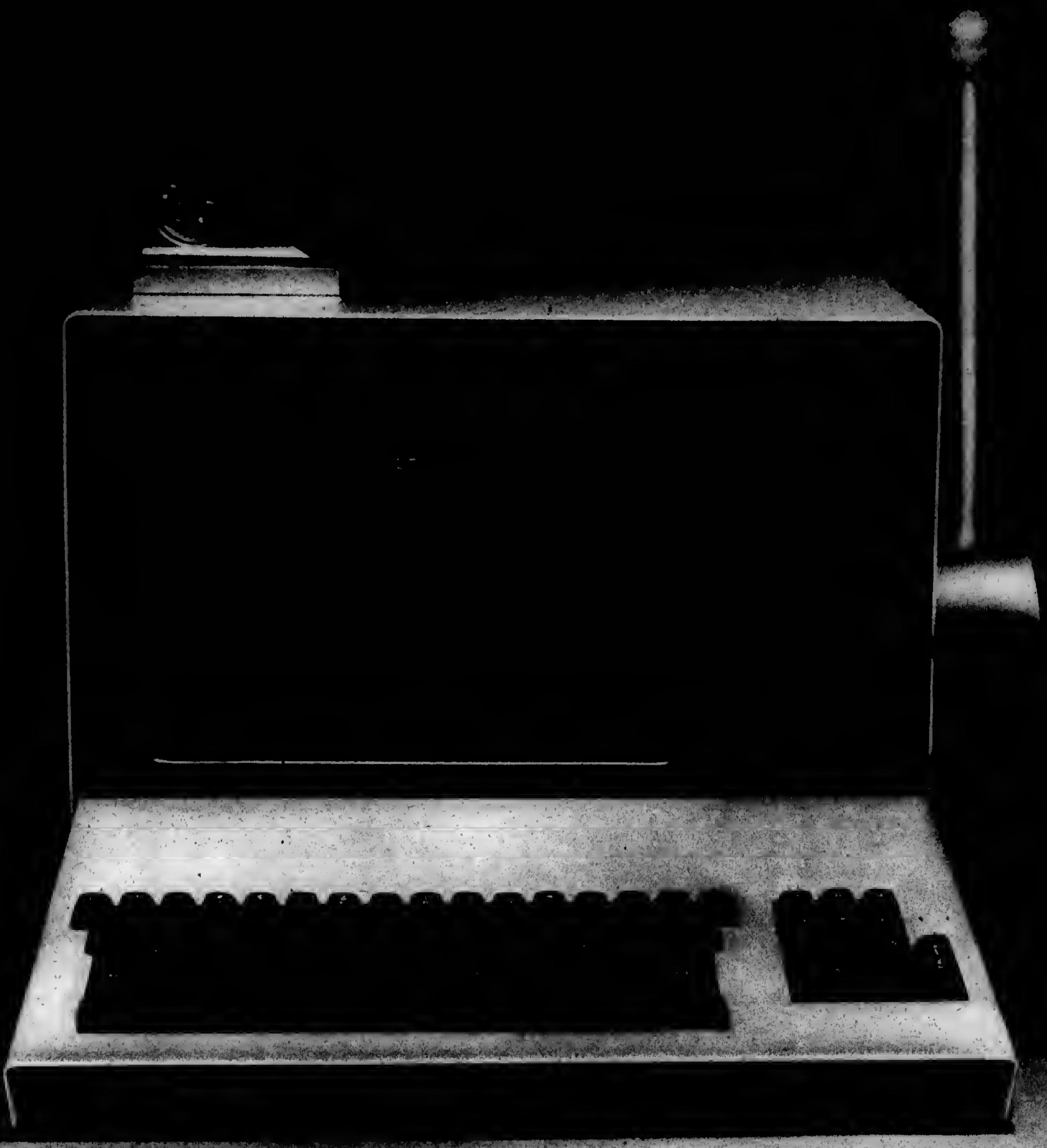

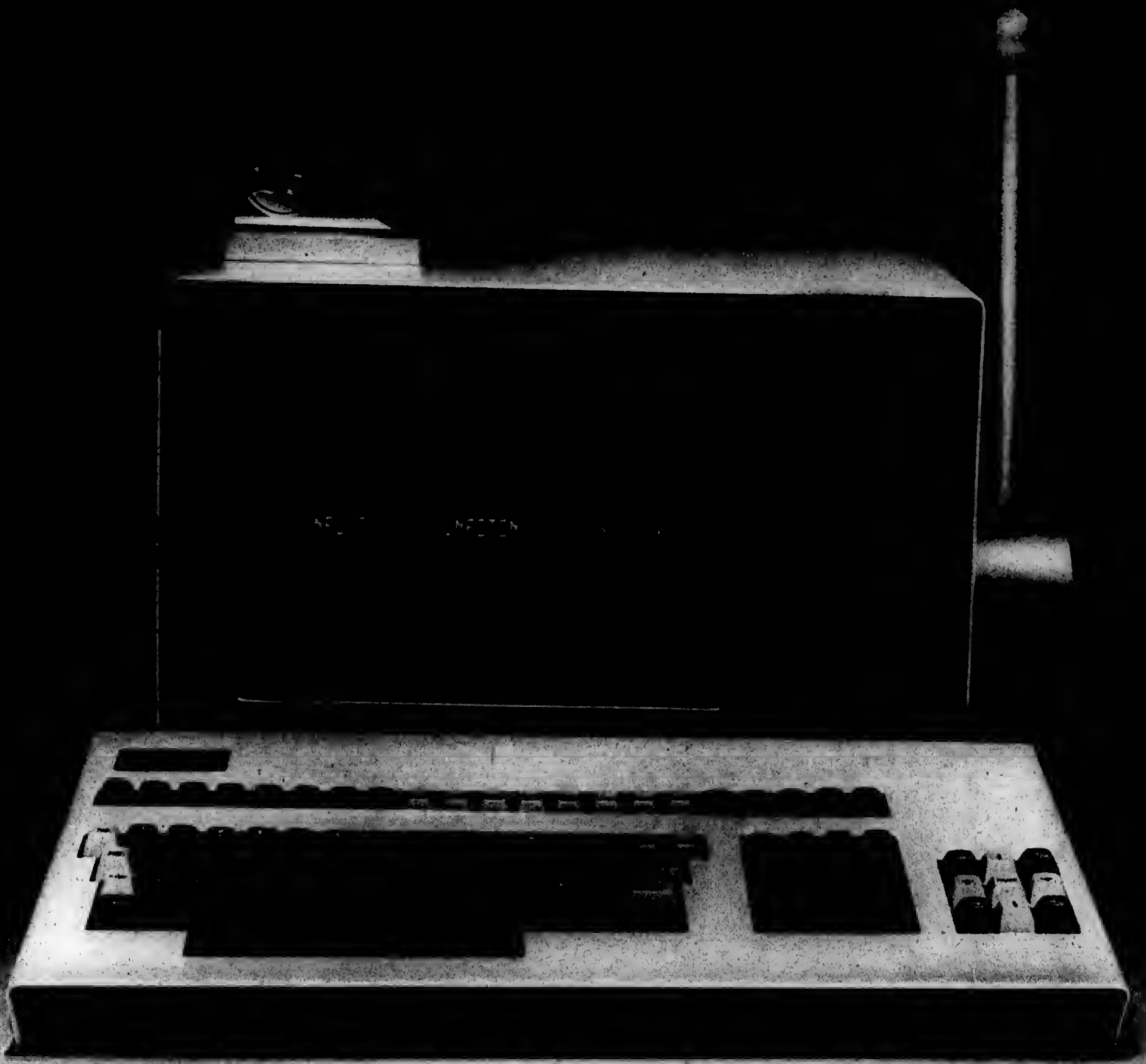

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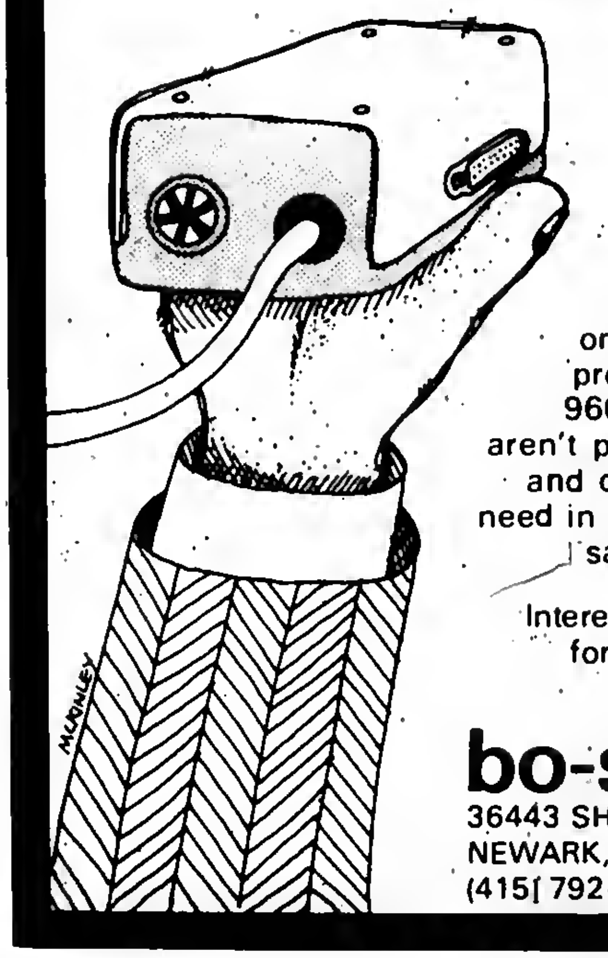

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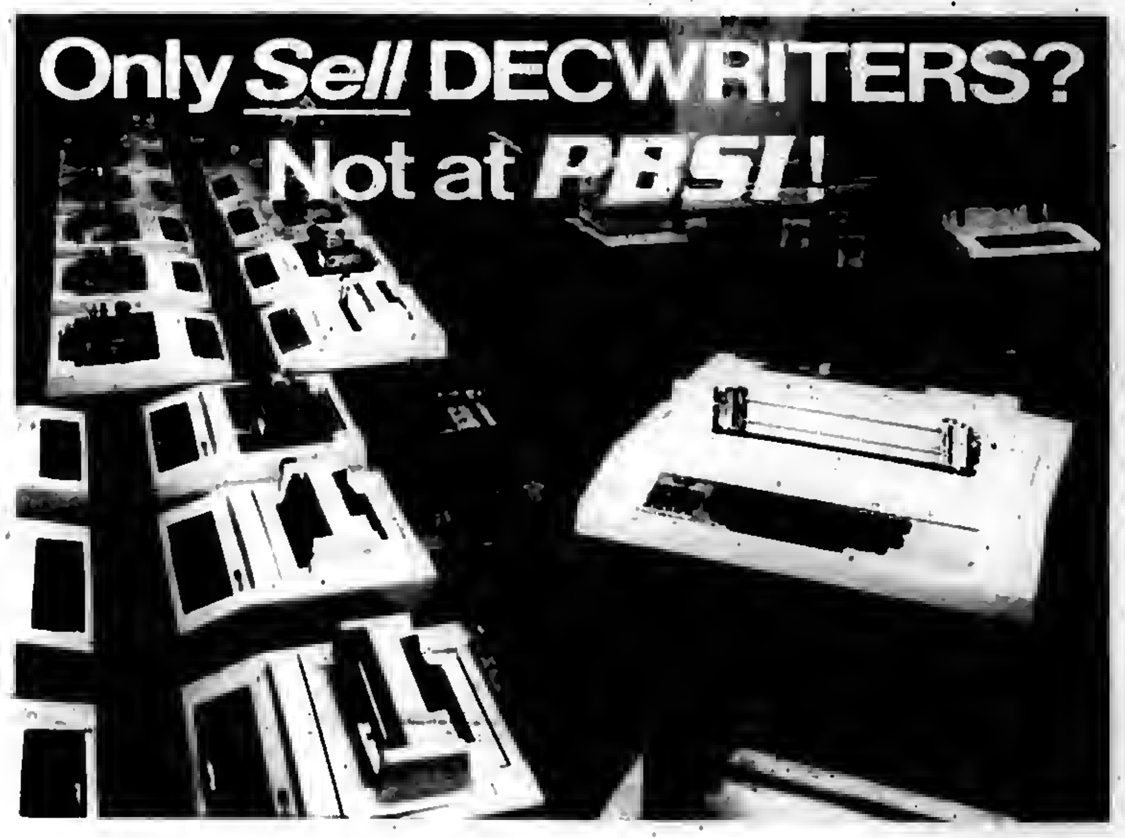

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RCA Links U.S., Singapore

NEW YORK — Public data communications between the U.S. and Singapore is now available from RCA Global Communications, Inc.

The service will allow such Singapore industries as banking, shipping, engineering and travel, as well as educational institutions, to access data bases in the U.S. It will also provide a low-cost alternative for multinational corporations to transmit data between U.S. home offices and Singapore affiliates, a spokesman claimed.

Asynchronous transmission at speeds up to 1,200 bit/sec and synchronous transmission at speeds up to 9,600 bit/sec are supported.

U.S. customers can obtain access through the conventional telephone network, value-added carriers such as Tymnet or Telenet and through specialized common carriers, the spokesman explained.

Customers may also interconnect directly with the recently introduced RCA Globcom International Data Exchange in the New York gateway.

The service is usage-sensitive, which means that customers pay according to how much they use the service. The cost from the U.S. is $12/hour plus 60 cents for each kilocharacter transmitted.

From Singapore, the rate in Singapore dollars is $30/hour plus $1.50 per kilocharacter. The U.S. dollar is currently exchanged at the rate of approximately one for every 2.3 Singapore dollars.

RCA Global Communications, Inc. is at 60 Broad St., New York, N.Y. 10004.

Old Song Gets New Verse

(Continued from Page 42)

drivers' handwriting on the invoices was impossible to read. That meant tracking them down for verification which could take several days if they were on the road.

"We began to recognize that we were missing some cash flow opportunities because the turnaround time was up to two weeks just to get them out. Then we had disputes with customers since our error rate was high because of the poor handwriting and other resulting inefficiencies of our manual system," Garrett added.

'Disaster From Start'

The telecopier network "was disaster from the start," Garrett said. "Drivers turned in their bills of lading daily, but we did not get the correct information any sooner. The billing information was then transferred to telecopier forms. Errors began in that transferral process because often the data was not copied correctly.

"And we had incredible transmission problems," Garrett recalled, "and on top of all that, the copy we received was often unreadable because of poor print quality. Between the poor telephone service, illegible copy and transmission problems, things got worse.

"Our error rate reached the point of embarrassment," he continued. "Suppliers got very irate and questioned almost every invoice we sent, and in many cases with good reason."

Invoicing procedures got so much worse that less than a year after installation, the telecopiers were removed and FS reverted to the manual mailing system while further investigating alternatives.

"We realized there is just not enough data out there to warrant an on-line system," he said. "We sent out a request for proposals for an intelligent off-line distributed network and narrowed our choices down to five vendors."

Garrett said FS selected MDS' Series 21 because of its easy implementation and operation, price and familiarity with the vendor's service record, which was a major consideration because of the remote terminal locations.

"All we had to do was specify the size and location of the record fields for our applications," Garrett said, "and that was completed in two days with the help of an outside programmer.

"After our data entry formats were written, one outside programmer worked with us, and using [the Mohawk Business-Oriented Language], the validations and range checks we required were added. That took about four weeks.

"And I am still impressed that MDS was able to meet the two-month time schedule we set up for equipment delivery," he said.

The MDS equipment is used for fuel and fertilizer invoice processing, the only goods handled at the dispatch stations. Bills of lading are keyed during the day and each dispatch station, via dial-up telephone lines, transmits the data to the central Series 21 site in three minutes vs. the eight-hour on-line telephone connect time the on-line system would require.

Batches 99% Correct

The editing powers of the Series 21 here include a wide range of variance checks and batch totaling. "Each recieved batch is 99% correct," Garrett said. "Operators at the terminals key in the data, the terminal then cross-checks the load size to gross and net gallons. Batch totals are then cross-checked with bills of lading and customers to make sure the correct customer will be billed.

"This increase in efficiency has enabled us to turn invoices over to accounts receivable in two days, instead of the five to 11 days we were previously experiencing," Garrett said.

The system has been reliable, he added, noting that when the equipment has gone down, MDS service representatives reached the remote locations promptly.

"We were previously familiar with MDS' service record because we used its key-to-tape equipment," he said. "The only problems with the Series 21 have been occasional bugs, and the service men were there promptly."

At present, FS is not planning any future upgrades. "For the first time we are processing invoices quickly and accurately from the dispatch sites," Garrett said. "Invoices are being turned around in two days with 99 percent accuracy. It is a great relief not to depend on the mails and phone companies anymore."

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Four Firmware Packages Enhance Dataroyal Printing System Line

NASHUA, N.H. — Four firmware packages said to allow both serial and parallel models of the Dataroyal, Inc. IPS-7000 series of intelligent printing systems to operate at up to 200 char./sec have been announced by the vendor.

The firmware packages represent four IPS-7000 configurations: the IPS-7018 and IPS-7019 parallel interface printers and the IPS-7218 and IPS-7219 serial teletypewriter-compatible printers.

Ascii Set

All four models print a 90-character Ascii set in 7 by 7 dot matrix. The models 7018 and 7218 feature a 500-char. circular buffer, and the models 7019 and 7219 offer a 3,500-char. buffer, a Dataroyal souce said.

Dataroyral IPS-7000 series intelligent printing systems combine a matrix printer with an 8-bit microcomputer supporting random-access memory and programmable read-only memory (Prom). Earlier IPS-7000 models combine that microcomptuer with a 120 char./sec matrix printer, the source explained.

Replaceable Prom

The microcomputer architecture of the IPS-7000 series allows the performance characteristics of any series model to be altered simply by replacement of Prom chips, such as those in the just-announced firmware packages as well as others introduced earlier this year.

The basic IPS-7000 can operate in receive-only or keyboard send/receive modes at a variety of speeds and, with firmware alterations, can handle other specialized applications, according to a Dataroyal spokesman.

Vertical Control

Additional features of all four models include programmable vertical format control, which allows operator-selectable printing of either six or eight line/in.; an audible alarm, which alerts operators when problem conditions exist; and a self-test switch, which can aid in fault diagnosis.

The IPS-7018 serial and IPS-7218 parallel interface models are priced at $2,230 for OEMs and $2,410 for end users in single-unit quantities. IPS-7019 serial and IPS-7219 parallel models cost $2,280 for OEMs and $2,425 for end users.

Deliveries are 30 days after receipt of order, Dataroyral said from Main Dunstable Road, Nashua, N.H. 03060.

Report Recaps Opinions On SNA/SDLC

SAN JOSE, Calif. — A report on IBM's Systems Network Architecture (SNA) and Synchronous Data Link Control (SDLC) derived from the experiences of IBM mainframe users is available from SBS Publishing.

Entitled *SNA/SDLC: Evaluation, Impact and Strategic Issues*, the report draws its conclusions from more than 200 responses to a mailed survey directed at more than 2,500 IBM 360/370 sites.

This material was reportedly supplemented by the opinions of "senior-level DP executives" who attended SBS Publishing's distributed DP (DDP) workshops and by research gathered for the publisher's two earlier reports, *SNA: 30 Years of Experience* and *SNA: Survey and Analysis*.

The report also includes a complete explanation of SNA in terms of its composition, intentions and relative place in the overall IBM strategy for maintaining control of its DDP accounts, the publisher asserted.

"While some of the user-perceived benefits [from SNA] center on the ability to maintain a centralized data processing approach to improve network control and discipline, the counterpoint benefits are also noted," SBS Publishing continued.

User-reported disadvantages of SNA/SDLC are also reviewed in the report, including problems associated with 360 application software as well as the Basic Terminal Access Method and Queued Teleprocessing Access Method.

Further, SNA/SDLC and its impact on the total network is evaluated form the perspective of overall network performance as the central goal, the publisher continued. A "blueprint for estimating conversion costs" is said to be included along with "detailed criteria for evaluations of alternative aproaches to SNA," ranging from DDP to devices intended to optimize the mainframe workload.

The report costs $750 from SBS Publishing at Suite 190, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

Controller Plays Various Roles

(Continued from Page 46)

The ISBC 544 interrupt scheme accommodates interrupts from up to 21 sources, the vendor continued. Four interrupt levels are handled directly by the 8085A and eight interrupts are serviced by an Intel 8259 programmable interrupt controller.

Flag Interrupt

The product features a flag interrupt capability generated from the dual-port memory. The flag interrupt is set whenever a bus master writes information into the base address of the dual-port RAM and is cleared when the on-board microprocessor reads from that address, Intel explained.

Thus, using a single instruction, the master CPU can interrupt the intelligent slave and establish a communications sequence, the vendor said.

The ISBC 544 intelligent communications controller costs $1,545 from Intel at 3065 Bowers Ave., Santa Clara, Calif. 95051.

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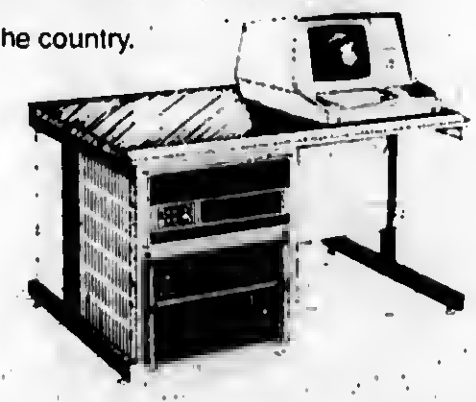

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Part of 8100 Announcement

IBM Introduces Office and Plant Systems

By E. Drake Lundell Jr.
CW Staff

WHITE PLAINS, N.Y. — Buried within IBM's recent 8100 unveiling [CW, Oct. 9] were two other product announcements — an office communications system and an interactive plant communications system.

The IBM 3730 distributed office communications system puts IBM's Data Processing Division firmly in the word processing and text editing marketplace. The 3630 plant system includes a family of data input and output devices designed specifically for industrial sites.

Both systems run in IBM 370 environments.

Supported by new models of the IBM 3791 controller, the 3730 was designed to be linked to a host 370. It can perform data processing as well as text editing tasks.

However, the system can also be operated in stand-alone mode for both types of applications.

The latest 3791 controllers can support up to 16 devices in one 3730 system, including up to 12 IBM 3732 text display stations and as many as eight IBM 3736 bidirectional printers, depending on the mix of the two units, IBM said.

Users can employ the system for text applications which they write themselves to create tailored letters, reports and manuals from text previously stored within the system, a spokesman noted.

Furthermore, when two or more 3730s are combined with a 370, terminals in one office system can be used to distribute information to other systems in an electronic mail type of application, according to IBM.

The system will be initially marketed in New York, Chicago, Los Angeles, San Francisco, Dallas, Boston and Washington, D.C., IBM said, because those cities have education and support centers for training on the system.

Plant employee uses IBM 3641 terminal to input data.

Purchase prices for the 3791 controllers, with disk storage ranging from 5.5M to 24.1M bytes, range from $32,660 to $44,860. Rental prices range from $1,159/mo to $1,510/mo; the system can be leased on a two-year plan for $986/mo to $1,285/mo.

The purchase price for the 3732 text display station with keyboard is $3,325; it can be rented for $112/mo or leased for $95/mo.

The 3736 bidirectional, 55 char./sec printer is available for purchase at $7,445. It can be rented for $250/mo or leased for $213/mo.

First customer deliveries for the stand-alone system will be in the first quarter of 1979, while systems designed for host attachment will not be available until the first quarter of 1980.

Plant System

The IBM 3630 plant system has been available previously on a limited marketing program, but is now being released generally.

It is supported either by the 8100 information system or IBM 370 processors, the firm said.

The family of devices includes:

- The 3631 and 3632 programmable controllers, which communicate between the system's terminals and the 8100 or 370 host. The 3631 has either a 250K or 500K-byte diskette, while the 3632 has either 5.2M or 9.2M

(Continued on Page 57)

One-Day Delivery Achieved

For Danes, DP Means Quick Mail

By Howard A. Karten
CW Staff

COPENHAGEN, Denmark — The land of blonds and smorgasbords has recently demonstrated another good idea: the use of computers to help speed mail delivery.

Every day approximately 2.9 million pieces of mail — a tiny amount compared with mail volume in the U.S. — come into the Danish Post and Telegraph Sorting Office, a 16-acre building here. The service — one of the few postal services in the world to provide figures on mail delivery — promises that 95% of all letters received by 5 p.m. will be in the addressee's hands the following day.

To help achieve this impressive feat, the system uses computers to control the operation of mail sorting and transportation equipment within the central facility. The computer's 10 Control Data Corp. System 17s ranging in size from 56K to 96K bytes — are configured into five dual systems that operate around the clock. To do so, they are serviced by CDC personnel on-site.

Each of the five pairs handles a particular mail-handling function, such as determining the drop point for incoming mail bags going to electronic sorting machines or directing trays of letters to certain areas of the building representing geographic locations in Denmark.

Custom-Built Facility

The facility housing the computers and mail-handling equipment was built with the installation of the computers in mind, according to Otto Vinter, project leader of the effort for CDC. Not only was it designed to handle the computers, but to handle substantial increases in volume as well.

The CDC equipment being used was selected after bids were submitted by all the major mainframe manufacturers, according to a CDC spokesman. The ability

(Continued on Page 57)

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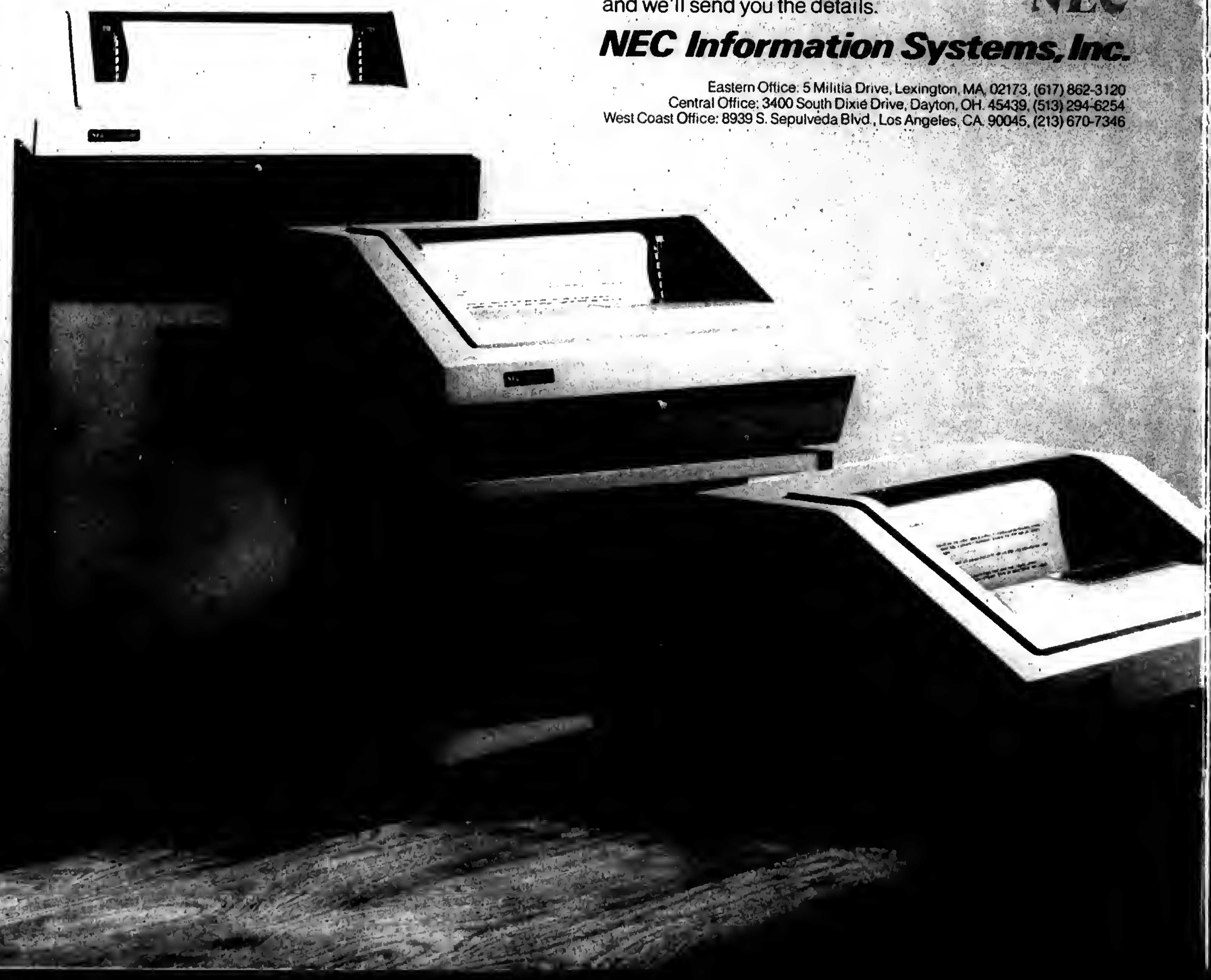

Storage Hierarchy Trends — Part 1

Glance at the Past Eases Planning for the Future

By George Rose
Special to CW

Over the last decade, the on-line storage hierarchy for large computer systems has expanded. The growth in data storage has been influenced by many factors.

As far as the future is concerned, it seems the requirement for larger capacity storage is open-ended. A diagram of the hierarchy, its boundaries and growth direction is shown in Figure 1.

While technology has served to increase the hierarchy's size, it has also fostered the kinds of problems that are typical of rapid change in a complex environment. A look at past developments and trends can provide a reasonable perspective with which to view the future.

A recognition of the way in which the hierarchy has changed can be useful for planning purposes, avoiding miscalculations which can be costly and difficult to change.

Not many years ago, a great deal of programming emphasis was placed on the efficient use of a limited, expensive resource — core storage. In today's environment, hindsight allows us to view those efforts as irrelevant to the present hierarchy.

Core storage has been replaced by semiconductor storage — typically, tripled in size — and the resource is now managed by a virtual storage operating system.

Magnetics was the technology on which the hierarchy was built, and it is still a dominant factor. Improvements in magnetics have been more in the nature of refinement than innovation.

However, the refinements have continually enhanced the viability of products based on magnetic technology and, conversely, have made it difficult for other technologies to penetrate the market.

In the early 1970s, the semiconductor replacement of core storage became the first new technology to supplant magnetics in a major segment of the hierarchy. Main storage has dramatically increased in size and speed, and decreased in cost, through semiconductor technology.

This week Rose, a senior member of the Information Systems Staff at Western Electric Co. in Greensboro, N.C., takes a look at past trends in storage technology. Next week, in the final half of this series, he will predict future developments in the industry.

Having already surpassed ferrite core memory, the performance characteristics and economics of semiconductor random-access memories (RAM) have continued to improve to the point where they are approaching a competitive position relative to electromechanical head/track disk.

In addition, two other solid-state devices, which are serially accessed and fabricated using techniques similar to those in the semiconductor industry, are being widely projected as candidates to fill the access gap between main storage (10 sec to 6 sec) and moving-head disk (10 sec to 3 sec). Charge-coupled devices (CCD) and magnetic bubble memory (MBM) are already being used in products unrelated to the large system hierarchy.

Continued improvements in component density and performance will help these devices to follow semiconductor RAMs in carving a niche. Memorex Corp. has announced a CCD cache product for disk subsystems and, undoubtedly, it will be followed by other vendors.

Figure 2 indicates the relative position of these solid-state products and magnetically recorded disks from a cost/time perspective.

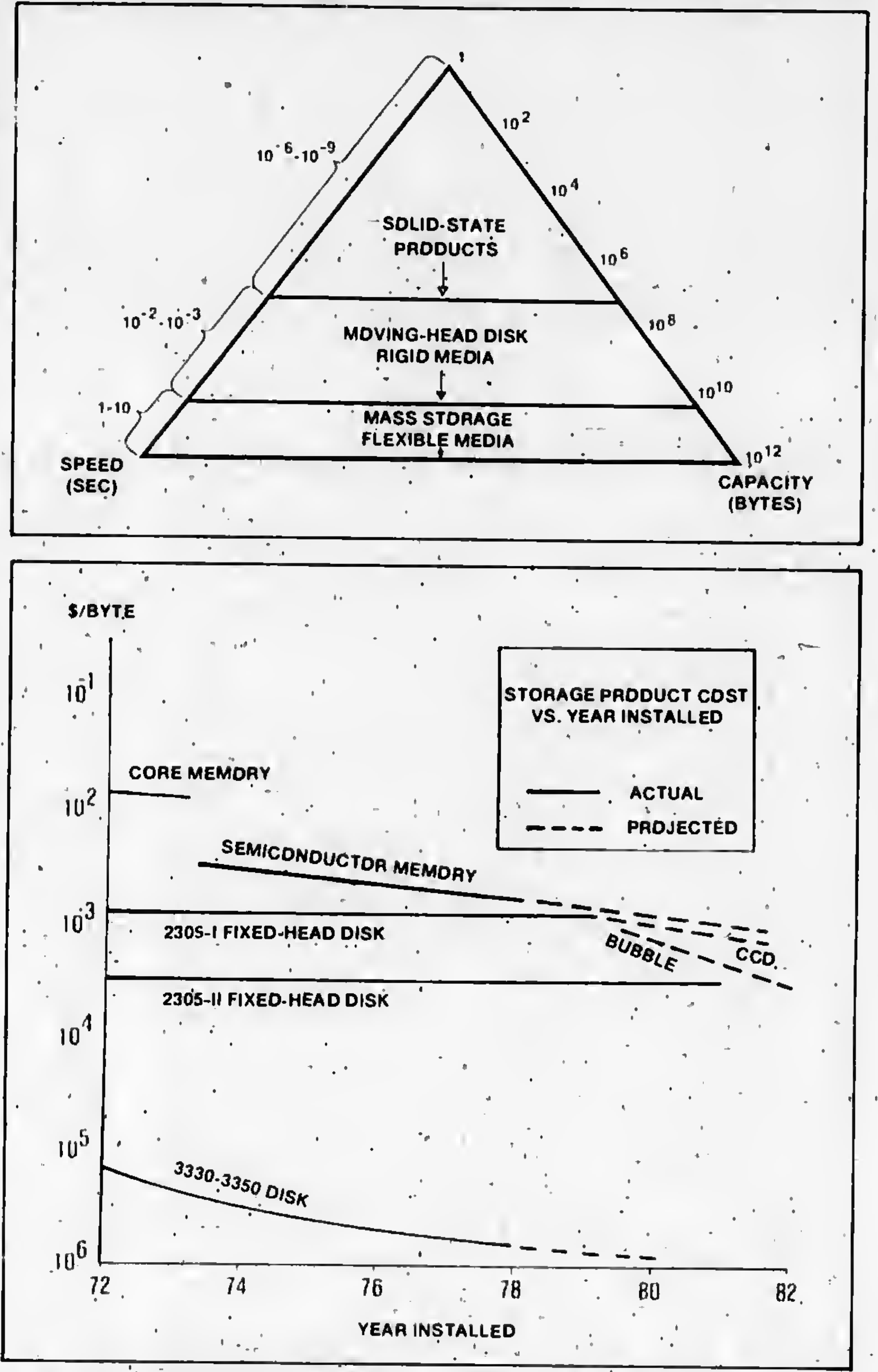

Figure 1 (top) illustrates storage hierarchies in terms of speed and capacity, while Figure 2 shows the cost of different types of storage as a function of the year in which each was introduced.

For Danes, DP Hastens Mail

(Continued from Page 55)

of the local CDC organization to handle the 30 man-year project that resulted, is said to have been the key criterion in selecting the Minneapolis-based company's equipment.

The real-time systems include operator communications functions to control the mechanical equipment. Operators in the facility can issue commands to do such things as start or stop various equipment or change sorting tables.

Serial Loop

Since the number of measuring and control signals involved (1,000 conveyers, each with six signals, plus other mail-handling machines) was so large, a direct digital interface was not possible. Instead, engineers designed a serial transmission loop with individually addressable control terminals.

This makes the software unusable elsewhere unless the same terminal loop is used, Vinter noted.

"The major benefits of the system are the maintenance of a one-day turnaround and the fact that the number of people required to handle the mail will not have to increase for several years," Vinter concluded.

IBM Adds Office and Plant Systems

(Continued from Page 55)

bytes of disk storage as well as a 500K-byte diskette.

- The 3641 reporting terminals, which have 22-char. alphanumeric displays and use either a 35-key numeric or 70-key alphanumeric keyboard. An optional magnetic reader attachment is available.
- The 3642 magnetic stripe encoder printer, in two models. The unit accepts hand-inserted documents and prints up to 10 lines or encodes magnetic stripes on, for example, inventory control labels. It features an alphanumeric 48-char., print set and a magnetically encoded 63-char.set.
- The 3643 interactive CRT terminal, models 2, 3 and 4, which have display sizes for 240-, 480- and 1,024 char. respectively. It offers either a 74- or 94-char. keyboard. The unit uses a gas panel display.
- The 3644 automatic data unit, which combines analog and digital I/O capabilities. The unit can link sensors, small computers, production status indicators, actuators and test and other instruments, IBM said.
- The 3645 document printer. The device can be used to generate special operator messages, such as the need to reorder a part, or reports on finished jobs or quality control tests.
- The 3646 scanner control unit, which permits attachment of up to four magnetic readers for checking job status or recording the use of parts.
- A number of magnetic readers — both hand-held and slot type — for reading magnetically encoded tags, documents, labels and badges. The readers attach by coiled or straight extension cables to the 3641 and 3643 terminals or the 3646 scanner control unit and have visible and audible signals to alert users to the status of scanned data.

Loop Technology

The 3630 system uses loop communications technology to attach both local and remote terminals to the system. Two local 9,600 bit/sec loops up to two miles in length are available; terminals more than two miles away use a 3842 loop control unit and teleprocessing facilities to hook up to the system.

These loops can be attached to either the 3630 controller or to an 8100 system, IBM said. When supported by the 8100, the system can reportedly be integrated into a distributed processing system through the use of Systems Network Architecture.

Terminals in the plant communications system can be supported by program products available for the 8100, IBM said. The system can be linked directly or through an 8100 to IBM 370s operating under DOS/VS, OS/VS1 or OS/VS2 MVS.

A "representative" system including a 3631 controller, six 3641 terminals with attached scanners, two 3643 CRT terminals, two 3642 encoder printers and a 3645 printer will cost $92,658. It can be leased for a monthly charge of $3,058 under a two-year contract for the controller and five-year leases for the other devices.

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Manufacturer Puts Technology to Work to Curb

TETERBORO, N.J. — Cost overruns are the bane of every manufacturer's existence, but one — a maker of navigational control systems here — is using computers to make cost estimating faster and more accurate.

Using technology — computers — to solve problems created by technology — the sophistication of aircraft subsystems — cost estimators at the Flight Systems Division of the Bendix Corp.'s Aerospace-Electronics Group are working with an in-house IBM 370/158 to get as quick and accurate an estimate as possible. In addition to these benefits, the system makes it easier to incorporate subsequent iterations and modifications to a proposal.

The system represents the latest step in an ongoing process. Previous efforts have been made by manual preparation and calculation, a small office computer and an outside service bureau. By moving in-house from the service bureau, the division said it saved $250,000 and increased productivity 30%.

With the manual system, a cost estimator — usually an engineer — had to contact all the departments involved in turning out an end product. This meant collecting labor and material costs, making computations for each item based on quantity, adding overhead costs, rechecking and so forth.

Since one estimate might contain 300 or more items, all elements of the task — data collection, cross-checking of totals, typing the appropriate forms and so on — were arduous, error-prone and difficult to modify. The division presently works on about 150 jobs concurrently, with 2,000 documents passing through the division weekly, so the magnitude of the task was tremendous.

Present System

The present system, running under IBM's Time Sharing Option (TSO), has cost estimators writing programs in VS Basic, an IBM program product. "We have found this situation ideal for us," according to Will E. Frey, manager of cost estimating for the Flight Systems Division. "The complexity of our computations would have made it difficult to convey our requirements to a programmer unfamiliar with our cost-estimating procedures.

"With the guidance of our IBM systems engineer, we were able to operate satisfactorily within six months," he noted.

W.J. Aspatore, controller for the division, pointed out: "Our product line requires processing an extremely large number of customer bid requests. The interactive costing system allows us to respond to these requests, many of which require fast turnaround, in a timely manner."

The company adopted the system partly because of the language used and partly because the system works via terminal. "We didn't have to hire a programmer and, in fact, we never would have been allowed to hire a programmer" to work exclusively as a programmer, Frey stated. "Without this approach, we never would have progressed this far."

One of the cost estimators studied the VS Basic language and wrote about 50 of the programs now in departmental use. Another cost estimator, George Vasilik, has taken over the department's programming duties and divides his time between cost estimating and programming.

Most Difficult Estimate

The most difficult estimate to prepare is one for a "unit," which is a functionally complete assembly manufactured for individual performance or system application. For each item comprising the unit, labor and material costs must be itemized, recorded, extended, totaled and checked. In addition, appropriate overhead figures must be included.

"Preparing an estimate is a huge data entry job," Frey observed. "A cost estimator must enter hundreds of line items to be calculated separately by a costing formula.

"With our interactive system, as the cost estimator develops these numbers, he enters them directly into the system once. This eliminates separate data preparation and negates the need for logging by various groups," according to Frey. "At the same time, programmed checks catch most data entry errors immediately.

"Printing the tabular material, too, used to require large amounts of overtime to meet deadlines," Frey recalled. "Now the computer generates it quickly."

Time Savers

Bendix recently submitted a bid for a unit consisting of more than 300 individual items, each of which could be required in various quantities.

Under prior methods, Frey estimated that it would have taken about five man-days to prepare this estimate. With the interactive system, it was accomplished in a day: a half-day for data entry and three hours to print the supporting documents on the terminal.

Even more time is saved when a second run is needed, since it is not uncommon for management to ask for a revised estimate reflecting recommended changes.

Formerly this would have required an additional five man-days; with the present system, the cost estimator only needs to enter the required changes because the bulk of the data is contained in the system. In three hours, the new printout is generated in full detail.

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Cost Overruns Caused by Technology Advances

(Continued from Page 60)

Thus the two runs which formerly would have taken 10 man-days are now accomplished in 10 hours. This has given Bendix a pronounced edge in the preparation of bids. Since management now receives the estimate several days rather than several hours before the bid is due, there is ample time to study the figures and make revisions.

Strong Point

A strong point of the system is its ability to handle "what if" strategies, according to Frey. "We can try different numbers — shifting profit margins a little — to see the effect on the final numbers. In the same way, we can test the economics of alternative manufacturing technologies to see, for example, if it would pay to invest in more printed circuit manufacturing equipment."

The cost-estimating staff has decreased by four persons in the past two years but, since the introduction of this system, it is accomplishing its work in less time, despite additional assigned duties previously performed by other departments.

Overtime has been almost eliminated; formerly part of the staff worked a minimum of two or three Saturdays monthly. Round-the-clock work during bid preparations was not uncommon.

"We are better able to provide service for our customers now," Frey remarked. "In the negotiating phase of a contract award, it is standard practice for the customer to go over the bid in detail, questioning the numbers and looking for opportunities to reduce the price.

"I recall an instance when negotiations were conducted by phone and an across-the-board percentage decrease was agreed upon," Frey said. "We were able to apply the adjustment via the terminal. While the customer was still on the phone, we were able to quote the revised estimate and subsequently mail him the supporting documentation."

Meeting Government Regulations

The use of automated systems has been especially valuable in meeting regulations for cost-estimating forms for government bids. Recent legislation permits suppliers to be compensated for the use of their capital facilities, and the Flight Systems Division is now showing the "recovery of money" on the cost estimate form.

It was accomplished with relative ease as an additional computation and has resulted in more income for the corporation.

There are times when the estimator must make material costs adjustments according to the desired quantity. The principle of purchasing curves has been applied to a program which projects the cost of items bought in quantity increasing by specified intervals. Thus, the price advantage for items bought in quantity can be quoted to potential customers.

Lower operating costs make it economically feasible for the corporation to maintain manufacturing facilities for the Flight Systems Division in Montrose, Pa. Requests for quotations involving this plant are reviewed in Teterboro, and the compilation of data is accomplished either in Teterboro or Montrose.

All data is then entered into the computer system at Teterboro.

Additional Job

"Life cycle costing," a job previously completed outside the department, was recently taken on ~~by~~ the cost-estimating department. This requires estimating the ultimate cost of a unit to the customer — including not only the initial outlay — but costs or breakdowns, servicing and spare parts as well.

Data is gathered from other departments and applied to the appropriate equations.

Prior to the cost-estimating department's involvement, each new job was calculated using as many as 15 equations for one bid. Now that it is being accomplished by computer, complex equations can be recorded and modified to suit any item entering the system.

Frey is enthusiastic about the results of the system and looks forward to further innovations. "We are committed to future advances in a system that has served us so well," he remarked. "We try to keep abreast of technological improvements as they appear so we can achieve maximum benefits from automating our cost-estimating procedures."

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Add-On Memory Cures Health Center Ills

By Howard A. Karten
CW Staff

PITTSBURGH, Pa. — An old New England maxim about innovation and change says, "Be not the first to try nor the last to buy." Like many maxims, it reflects truth borne of experience, and it is practiced in many DP installations, where stability of operation is often as important — if not more so — than acquisition of the latest technological devices.

Ignoring this conventional idea, the University Health center of Pittsburgh last year installed an add-on memory system it said was "probably the third or fourth one in the country," and the performance of the unit since it was installed has been "fantastic," according to David D. Libenson, director of the health center's data center.

Although Libenson said he was initially "apprehensive" of the large time block requested by Itel Corp. to install the 1.5M-byte Universal Memory System (UMS), he added that "from the day it was installed to today, it has never been down. Itel sent some people from the plant to install it and make sure things went properly."

The memory's uptime has been in excess of 98%, he estimated.

The Itel unit replaced an earlier add-on memory the center acquired from Cambridge Memories, Inc. (CMI). Libenson explained that not only did he have serious and continuing problems with the previous unit, but they increased when the Bedford, Mass., firm underwent financial difficulties several years ago and transferred its maintenance contracts to Raytheon Service Co., a subsidiary of Raytheon Co.

"After CMI sold its field engineering division to Raytheon, we got extremely poor support — I'm not sure just whose fault it was, but the service was terrible," he said.

An example Libenson cited was an instance when the memory was malfunctioning, and he couldn't find anyone to fix it. "I called the regional manager at Raytheon and asked, 'How can I get someone to come down here and fix it? He replied 'You can't — tough." The manager employed by Raytheon left the company shortly thereafter, he noted.

Libenson explained in some length that the problem might not have been completely Raytheon's fault, since it wasn't Raytheon's equipment.

"In addition," he continued, "there were engineering problems here. We had a field-upgraded Model 145, as opposed to a plant-manufactured system; as I recall, I was told a 145 Model 1 is not the same as a 145 Model 2, and these are not the same as a field-upgraded Model 2."

The experience has not totally soured Libenson on Raytheon, however, since he is presently planning to buy a remote job entry system from the company. "I don't have a closed mind toward Raytheon or anyone else," he commented. "It was the company's attitude I couldn't deal with."

Libenson said he was able to learn something valuable from the experience. "The memory incident has led me to feel that the stability of the organization that sells me equipment is just as important as the product I'm buying.

"When I looked at Itel as a potential vendor, it was just as important to me that it was going to be in business for a period of time and be able to support me," he said.

The configuration in use at the health center includes an IBM 370/145 with 1.5M bytes of memory, running under OS/MVT. An on-line patient data base, containing patient histories, is accessed by approximately 40 IBM 3270 CRTs located in the admitting area, emergency room and outpatient areas.

Medical Applications

Medical and scientific applications running on the system include an ongoing study linking the health of newborns to the health practices of the mother, a system for doing radioimmunoassay calculations and a system used to enter the results of lab tests. In addition, the system sends out yearly notices to obstetrical/gynecological patients, reminding them of appointments for Pap smears.

Cost justification is always uppermost in Libenson's mind in looking for new applications. "For everything we do, there is a cost justification. The system has allowed management the opportunity of keeping costs down. Because of the quality of the service we provide, general management has the opportunity to implement strategies to save money."

Libenson is presently investigating the possibility of acquiring a system that checks for possible interactions among two or more drugs administered to patients. "But we will only acquire it if it is cost-effective," he explained.

The system is performing well, Libenson noted, and that has created a minor problem for him. He said that in the past year the system has averaged in excess of 97% uptime and added that he has had no unscheduled downtime in the past two months. "A year ago, people complained that the system was good, but it wasn't up enough. Now, people have gotten used to the system's being constantly available, except that the response time is a bit variable. People don't remember the immediate response [that they usually get] — that's what they have come to expect. Unfortunately, they remember the occasional half-minute response times."

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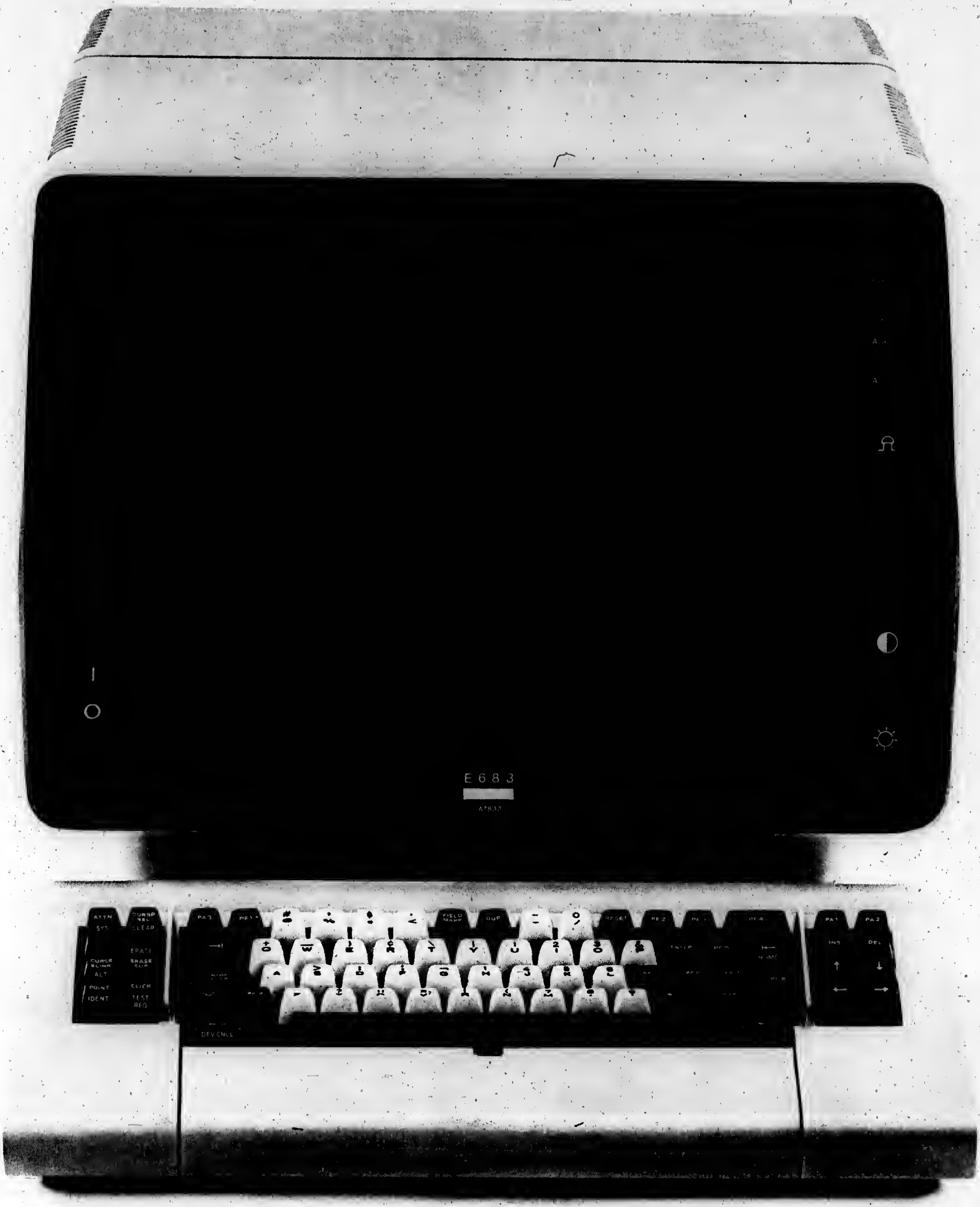
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In addition, any existing System/370 applications can be called up from an 8100 anywhere in the company. That means you can capitalize on the information investment you've already made.

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A big factor in the 8100's ease of operation is the new IBM 8775 Display Station. It offers advanced functions such as reverse video, variable screen capacity, division of the display in up to eight segments, field validation functions and operator guidance features.

On top of all this, IBM program products available with the new system can give your headquarters DP staff a window to monitor what's happening at any 8100 location, right from the central site. They can help out if someone needs programming assistance, or if difficulties crop up. And remote program maintenance can be greatly simplified.

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Two 3033s Linked in Shared Disk Environment

CANOGA PARK, Calif. — Two IBM 3033 processors have been loosely linked here in a shared disk environment in what is claimed to be the most powerful commercially available system on the West Coast.

Mellonics Information Center, which handles processing for Litton Industries, its parent, as well as commercial customers, made the hookup when it installed its second 3033 at the end of August.

That system — an 8M-byte processor — joined an earlier 6M-byte 3033, which was installed in July, according to Nate Weaver, director of computer systems for the firm.

The systems both run MVS and are coupled through the use of JES-2, he said. Disks on the system include a mix of 3350s and 3330s, he added.

Installation of the two systems went "smoothly," Weaver said, although the company experienced a few problems "that you would get with any system that had been shipped across the country."

However, these problems were "relatively minor" in that they could be "fixed quickly" by the IBM personnel assigned to the account, he said.

Within a month of the second 3033's installation, the situation was "stabilized," he added.

The two 3033s replaced Mellonics' earlier installation which consisted of an 8M-byte 370/168 Attached Processor (AP) configuration and a 4M-byte 370/158 AP.

In early tests of the 3033s compared with the earlier units, Mellonics found that a single 3033 had "somewhat better throughput" when compared to the 370/168 AP that had been installed.

However, the firm expects the throughput to improve as it fine tunes its system and begins to use the MVS Systems Extensions from IBM. These could give a 15% to 20% performance boost, Weaver said.

The early tests were made running programs that had been operating on the 168 system without any modifications at all, he emphasized, adding that the modifications planned should make the 3033 look even better in comparison.

System Benefits

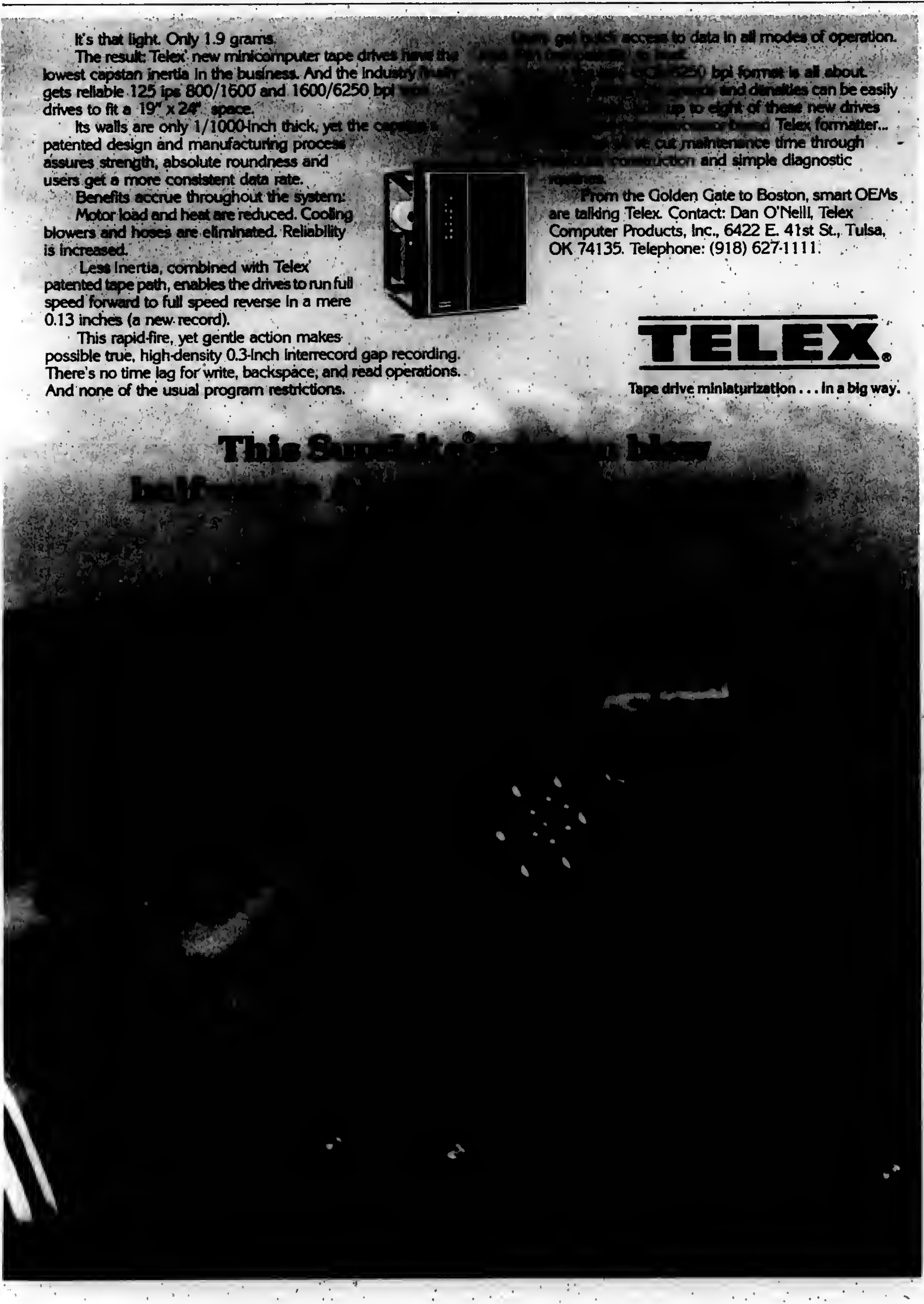
Ease of maintenance and system reliability are two of the benefits expected with the 3033s, the latter having been demonstrated already as the first 3033 operated continuously for 10 days without an initial program load.

Mellonics was formed in 1968 through the consolidation of two large internal DP centers of Litton Industries, Inc. and the organization is a subsidiary of Litton Systems, Inc.

Early growth in the commercial market was slow, but beginning in 1973, Mellonics has experienced a growth in revenue from computer services that was in excess of 400% through fiscal '78. During the same five-year period, available computer resources have increased 20 times over the original level. Currently Mellonics has a customer base of more than 100 companies and 500 to 800 users.

Typically, TSO usage runs at about 100 terminals simultaneously, Weaver said, adding that the system runs 24 hours a day, seven days a week.

Mellonics Information Center is located at 6701 Variel, Canoga Park, Calif. 91303.



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Service Bureau Trying Distributed Data Entry

ROLLING MEADOWS, Ill. — "Service bureaus as we know them today are going to disappear, probably within the next decade," according to Joe Carpenter, president of Carpenter Computer Services, Inc.

Carpenter's service bureau here handles processing for more than 40 firms, representing a variety of industries including construction, manufacturing, insurance, distribution, importing and retailing. And he thinks he has come up with a way of blending the power of computers, communications and distributed systems to provide a new service for his clients — one that will bring the concept of a centralized DP operation into the 1980s.

Carpenter has started placing data entry back in the customer's hands, while still providing the raw processing power traditionally offered by service bureaus. To carry out its plan, the company intends to keep its mainframe and put smaller, less expensive devices at each customer site. It has chosen Pertec Computer Corp.'s XL40 Distributed Processing Systems (DPS) for the customer sites.

Data entry is the single largest problem a service bureau faces, according to Derrell Gilstrap, a Carpenter vice-president. While service bureau personnel are conscientious and well-trained, he feels they are generally not familiar with the specific data they input. If the user inputs the information, errors or inconsistencies will be detected quickly and corrected and the data entered will be more accurate.

"We've superimposed the distributed DP (DDP) philosophy on a service bureau operation," he explained. "With our system, the people who are now filling in forms and mailing them to us will simply key the data into a terminal. As a result of this change in operation, the data will be cleaner, processing will be faster and applications will be enhanced."

One of the innovative uses to which Carpenter is putting his system is catching fraudulent users of the "cents-off" coupons food processing firms often run in newspapers.

In coupon fraud, retailers submit coupons without having purchased enough of the product for the number of coupons submitted, or else they cheat in other ways. "We have the names of 1,500 to 1,600 suspected fraudulent retailers in the system and can check them when we prepare the documents for input," he explained, "instead of doing a manual look-up on them, which is quite time-consuming."

Manpower Needs Reduced

"Using the XL40 system, manpower requirements have gone from four people to one person. The other three are freed for more important work," Carpenter stated.

The service bureau plans to deliver turnkey systems to its customers complete with programs, storage, formats, communications and service.

Gilstrap does not foresee any problem with the variety of customers his firm services since the XL40's coding makes it a simple task to modify one data entry format to suit the needs of several users.

The primary advantages of this approach come from the XL40's processing power, he said. The system can automatically edit and verify data as it is input. Should an error occur, the user either knows the correct information or has immediate access to it and can initiate a correction. A typical service bureau usually flags an error for later correction.

Carpenter's plan, still in an early phase, would place an XL40 at each customer site. An average system would consist of three terminals, 96K bytes of memory, 10M bytes of disk storage, a printer and a communications capability.

Businesses with insufficient volume to justify an XL40 could install a smaller Pertec XL20, he noted. Or, for very low-volume applications, they could use an XL40 remote On-Line Subsystem consisting only of a CRT and/or printer configuration.

Cost Justification

Gilstrap said an on-site processor would result in slightly higher monthly bills for the customer, but he explained the benefits would far outweigh the small additional charge.

A good portion of the cost justification will come from elimination of duplicate efforts, he pointed out. Today, customer personnel code the forms, which Carpenter personnel then enter.

The service bureau is currently running two eight-hour shifts of pure data entry. Under the new system, information will be handled only once.

Data accuracy will be increased, since the operators will only worry about their own source documents, not those of 40 other customers, and will not confuse formats or codes.

Restricted or sensitive data no longer has to be released to "outsiders." This data will be input at the customer's site by customer personnel, transmitted over telephone lines to Carpenter's mainframe, processed and retransmitted. This greatly reduces the possibility of theft or unintentional disclosure. It also speeds up response time as messenger and mail delays have been eliminated.

Local processing power and storage will also allow a customer to use this part of his files, approximately 20%, which are needed for daily work. The remainder can be batched for processing the next morning.

If a customer wishes to implement certain processing jobs on the XL40, Carpenter will support that idea, too. The service bureau can, for example, program certain applications on its own XL40 and download them to the customer's system.

"For most of our customers, we're a consulting firm first and a service bureau second, so we're not afraid of passing off business if our clients do some on their own," Gilstrap explained. In fact, Carpenter envisions some firms will use the XL40 as an intermediary step to acquiring their own system, in which case Carpenter would most likely remain as a consultant and provide services for heavy volume processing.

Gilstrap is confident that his firm's DDP approach will see it through the eventual demise of the "typical" service bureau.

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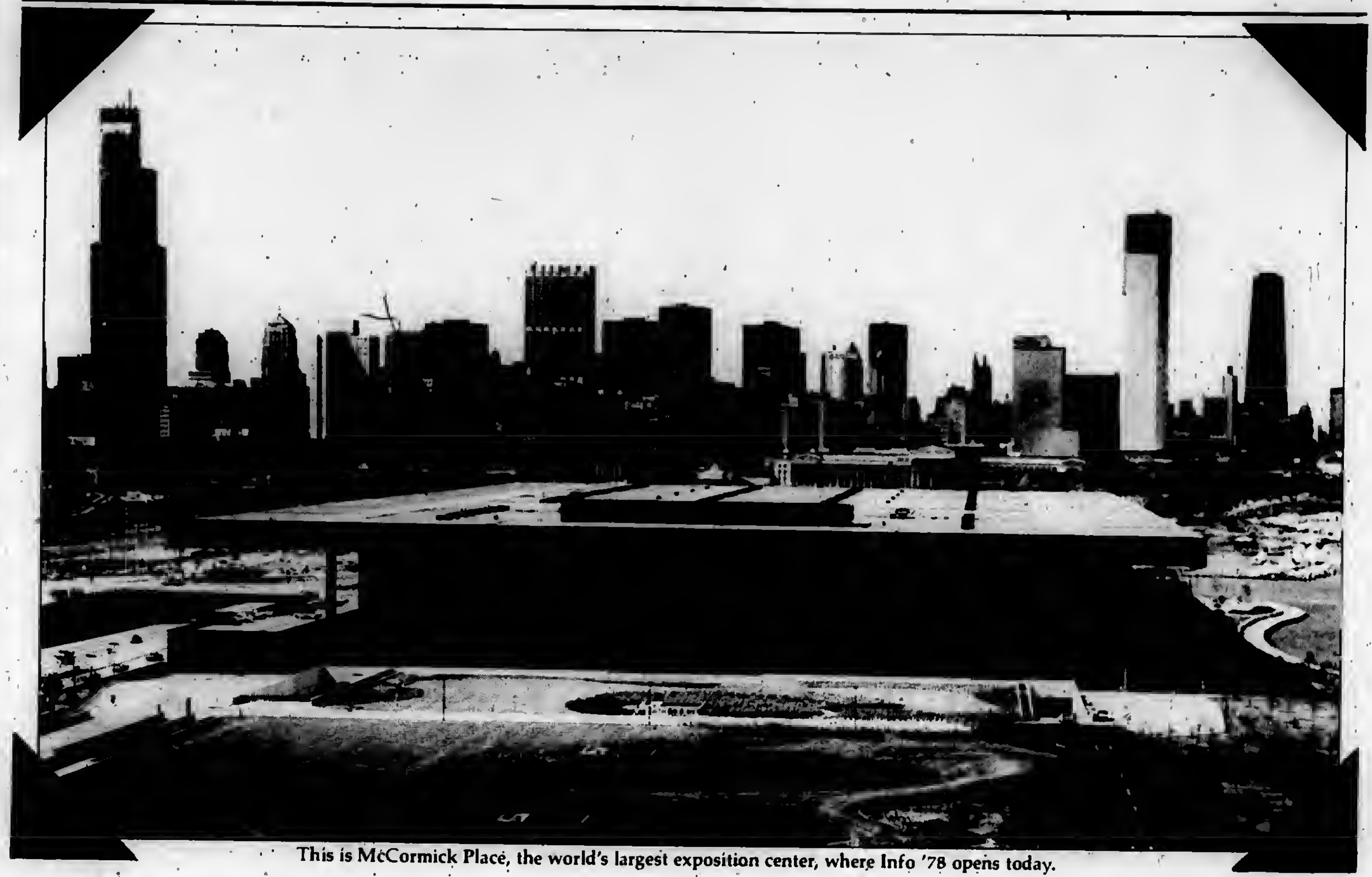


This is McCormick Place, the world's largest exposition center, where Info '78 opens today.

Info '78 Promises Wealth of Speakers, Exhibits

By Tim Scannell
CW Staff

CHICAGO — Private eyes pay for it, telephone operators dispense it and today, here at McCormick Place, thousands of DP executives will discuss it.

The "It" is, of course, information — or, to be more precise the management of information as it relates to a company's DP operation.

More than 15,000 people are expected to attend the four-day Information Management Exposition & Conference (Info '78) which will feature over 200 speakers and exhibits by nearly every major mainframe manufacturer. The show's theme, "Strategic Planning in the Information Age," will cover everything from data and word processing systems to office automation. The focus of the show however, will be on the useful application of known and developing technologies, rather than on the technology itself.

"The purpose is to demonstrate how executives can make their operations more productive by improving existing information systems or creating new ones," a show spokesman explained.

The show, with its crowds and number of exhibitors, can be loosely compared to the National Computer Conference during its initial run in 1973. Since last year, Info has attracted an additional 70 exhibiting companies and increased its exhibit space from 44,000 square feet to 70,000 square feet, the spokesman noted.

The conference is broken down into three major areas, focusing on information management, information technology and office automation. In addition, several sessions will address problems and developments in electronic mail systems, data base applications, auditing, security management and hospital DP systems.

Info was inaugurated in 1974 as a replacement for the semiannual Spring and Fall Joint Computer Conferneces; until this year, it was never a money-making proposition for show sponsors Clapp & Poliak, Inc.

The original program was structured by the American Management Associations, and the show's present planners have stayed with the four-year-old format of approaching DP from a management rather than a technological angle.

One noteworthy aspect of the show is that it draws a large number of exhibitors whose presence attracts interested and influential participants. The vendors "recognize us as a viable exposition with an attendance made up of the right people," Clapp & Poliak's Richard Wolcott said.

Among this year's exhibitors are three which will be at Info for the first time. Hewlett-Packard Co., which reportedly hasn't exhibited at NCC for two years, Texas Instruments, Inc. and Quantor Corp.

NCR Corp. has expanded its booth space since last year from 300 feet to 1,500 feet. This demonstration of en-

(Continued on Info/10)

Stieger, Fertig to Speak

Key to Manager's Success Set for Probe

By Tim Scannell
CW Staff

CHICAGO — Like the great teams of Lewis and Clark, Gilbert and Sullivan or Abercrombie and Fitch, information management and technology share an inseparable hand-to-hand relationship that is vital to the DP manager's success in the corporate world of the 1980s.

Management must adapt and change as DP technology becomes more sophisticated and complex or the entire system "chain" will be jeopardized. Tomorrow's DP manager must be able not only to respond to the various system changes and alterations, but to predict what these changes will be and how they will effect the entire corporate DP structure, according to William Stieger, a Standard Oil Co. hardware/software evaluation analyst.

Stieger will address the problems of DP management and capacity planning this week at Info '78, a four-day information conference and exhibition scheduled to begin here at McCormick Place today. The conference will run through Thursday and focus on such areas as DP management, distributed data processing, data communications, I/O systems, data analysis, security management, office automation, electronic mail systems and small business equipment.

Capacity planning and development of a DP-oriented battle plan are possibly the two most important functions of the contemporary DP manager, Stieger explained. Unfortunately, far too many managers ride on the tide of new technological developments and increasing business activity, failing to acknowledge or prepare for upcoming system demands.

"If the DP manager plans in detail at all," Stieger said, "he's probably doing better than anybody else in the company."

Stieger's session, "Capacity Planning — A Necessary Component of DP Management," will deal with the DP executive's planning responsibilities as well as "the kinds of questions which arise in the course of using a [computer] system.

"'How come things are slow?', 'How can we make things run faster?', 'Why do we have to spend this much money?' — these are basically the questions that a DP manager gets from people who are not familiar with computing," Stieger pointed out.

A manager's basic duty is to present the DP function to the rest of the corporation minus the technical jargon and mysterious acronyms.

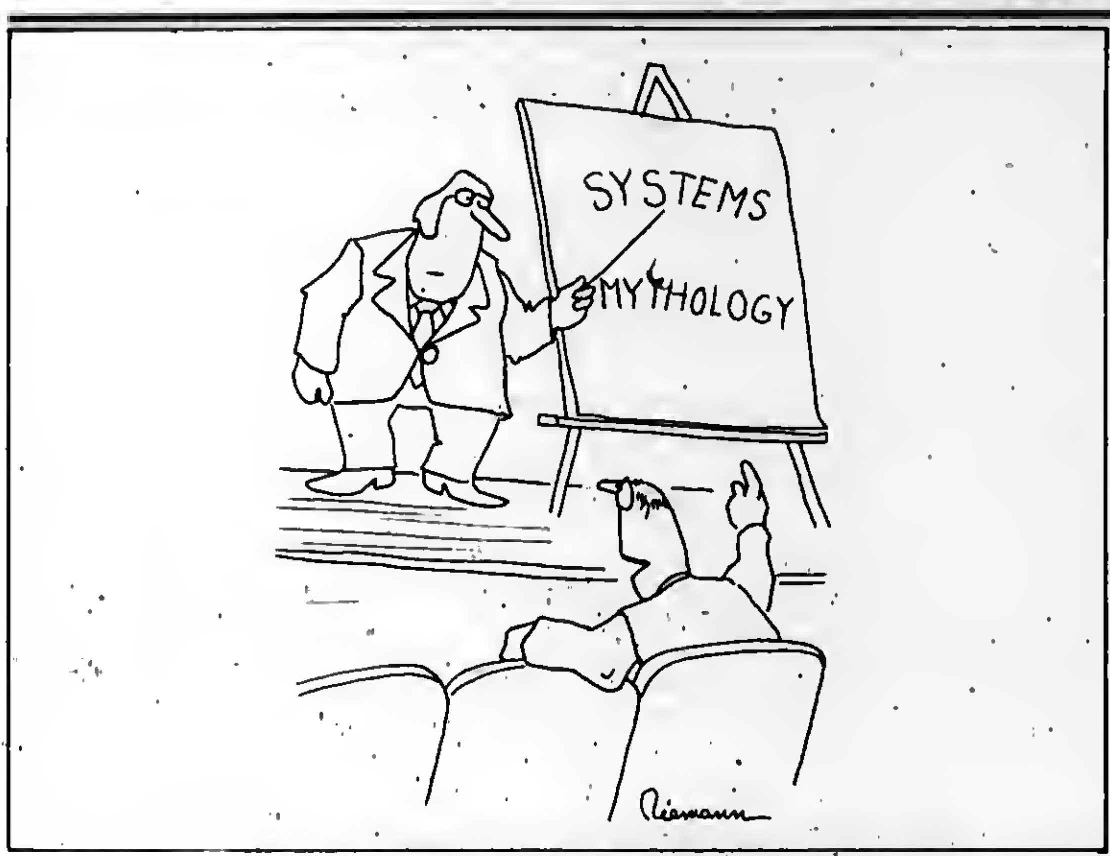
Hopefully, the company will return the favor and extract corporate doublespeak when dealing with the DP department.

A DP manager should "simply sit down and write a story or a scenario stating that if the company does these things and has these administrative implications, then it can infer the following DP assumptions," Stieger believes.

Times Definitely Changing

Technically, the times are definitely changing, according to Robert Fertig, vice-president of Advanced Computer Techniques Corp.'s Technology Analysis Group (TAG). The mainframe's basic architecture is quickly evolving

(continued on Info/2)



'For the Last Time, Larkins, the Word Is Methodology.'

Key to Success Under Probe

(Continued from Info/1)

from its well-known centralized systems and terminals — or to what is collectively known as the "distributed function," Fertig stated.

Fertig, a self-described "IBM-watcher," will discuss the merging trends in computer architecture and the impact IBM systems will have in the next decade. For instance, he noted, manufacturers today are increasingly concerned with a new machine's functions rather than its speed.

User Concerns

Users are more interested in better reliability, availability, serviceability and ease of operation rather than "raw millions of instructions per second performance dollar," Fertig said.

IBM system architecture will also undergo some radical changes during the 1980s, Fertig observed.

The company's 30 series architecture is basically an enhancement of the 370 designs, which are based on the 360, and have been around for some 13 to 14 years.

Because all of the equipment is functionally the same, the bulk of the costs are spent on developing new software and support, Fertig said, generating a "price erosion trend."

"The price of IBM's hardware is dropping all the time while software and support costs rise," to the point where "very soon they'll be giving it away," Fertig claimed.

Fertig reportedly will outline 18 key challenges and potential restrictions which could inhibit IBM's growth in the 1980s and illustrate some possible solutions to the company's evolutionary problems.

Robert Fertig

If IBM reduced the need for complex job control language (JCL), automated all of its file-handling functions and demonstrated "effective" user productivity, Fertig suggested, the company might reverse inflationary software trends and, consequently, be able to charge more for its hardware in the future.

Nitty-Gritty On Tickets, Show Hours

CHICAGO — Info '78 attendees can register at the door starting at 8 a.m. Monday morning, Oct. 16, for the four-day show.

A four-day ticket costs $225, which includes admission to all sessions and the exhibit floor.

A one-day conference ticket costs $80 and also covers admission to the floor and a half-day conference ticket is also available for $45. Those who wish to visit only the exhibit floor will be charged $5.

Exhibitors are distributing advance registration tickets to their customers that allow admission to the floor for $1.

The exhibit floor is open from 11 a.m. until 5 p.m. daily except for Thursday, Oct. 19, when exhibitors will fold their tents and steal away at about 4:00.

The show will be on the street floor at McCormick Center, which is the top-most exhibit floor.

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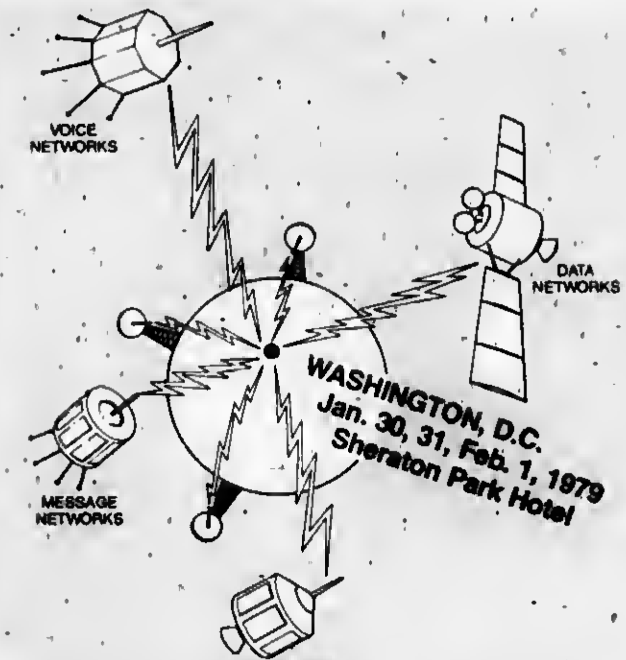

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User Needs Critical Eye

No Time for 'Honeymoon' With Mini: CPA

By Tim Scannell
CW Staff

CHICAGO — Management's corporate "honeymoon" with a new business minicomputer system should be less of a starry-eyed infatuation with the machine and more of a detailed inspection of the computerized partner.

"The small business system does not, in effect, run itself," according to Richard Hoberman, a supervisor with the certified public accounting firm of Seidman & Seidman. "Once the system is in and the vendor has left, a user has to take stock and see what the weak points are and then try to plug whatever holes exist."

Hoberman will discuss the pros and cons of business/minicomputer relationships and highlight those areas that most often lead to user/machine divorce this week at the Info '78 conference. The four-day information extravaganza, together with an equipment exhibition presented by more than 200 vendors, is scheduled to run until Thursday, Oct. 19, here at McCormick Place.

Hoberman's early-morning session, focusing on what the minicomputer user should do after the system is plugged in, will address four key areas of user/computer relationships: The machine's impact upon the management staff and executive decision-making activities; the computer's effect on the employees; what potential problems to look for both inside and outside the system; and some important guidelines to follow before and after the minicomputer's installation.

Key Management Function

Control of the minicomputer system, through effective systems planning and operational monitoring, is probably the most important management function, Hoberman stated. The first step on the road to control is to "thoroughly document" each department that is touched by the computer and clearly illustrate the informational pathways.

The best way to do this, he said, is to flowchart all paperwork and forms from "cradle to grave" or from the entry of each bit of information into the system until its exit.

"Scattergraphs," or responsibility matrices indicating certain system applications and the employees who perform them, are also important to the final strength/weakness analysis. "Look for a nonsegregation of duties or a person who has too many functional controls," Hoberman said. In addition, "If a piece of paper is handled four, five or six times . . . it's conceivable you might want to reroute that information flow."

There are a number of "red warning flags" that signal an ineffective or redundant minicomputer system, Hoberman pointed out. The first is the "one-man DP shop" where a single person is responsible for everything from flipping the computer's power switch to programming the machine. This person literally has the company at his mercy and can steal the firm "blind," he said.

Richard Hoberman is slated to discuss the pros and cons of small business minicomputers and highlight areas that most often lead to user-machine "divorce" on Tuesday morning, Oct. 17 at Info '78.

Another signal is the "slaves-to-the-computer syndrome" whereby the majority of the company's detail work is done outside the minicomputer system. In this case, the computer is used more as an editing and printing machine than as an information processor. Manually assisting the computer in calculation and accounting functions wreaks havoc with the system's auditability and seriously upsets internal control, Hoberman said.

And perhaps the greatest threat to system integrity and security is the "helpful software vendor" who rigs an auto-answer modem on a company's computer and proceeds to troubleshoot problems from his office.

The problem with this particular arrangement, Hoberman contended, is that it is an "open invitation to anyone with a terminal to mess with your system." Valuable customer lists or other privileged types of information become fair game to unauthorized users who know a system's telephone number or passwords.

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	INFORMATION MANAGEMENT			INFORMATION TECHNOLOGY			OFFICE AUTOMATION	
MONDAY AM	Session 1.1 page 10 Crossroads in Information Management Session 1.2 page 10 New Opportunities for the DP Manager PLANNING		CONTROL	Session 1.1 page 10 Crossroads in Information Management Session 1.2 page 10 New Opportunities for the DP Manager			Session 1.1 page 10 Crossroads in Information Management Session 5.1 page 1e Progress in Office Automation	ORGANIZATION
MONDAY PM	Session 1.3 page 10 Information Systems Planning for the 1980 Corporate Environment	ORGANIZATION	Session 1.3 page 10 Information Systems Planning for the 1980 Corporate Environment	Session 2.1 page 12 Planning for the Merging Trends in Computer Architecture INPUT/OUTPUT AND DATA ANALYSIS	DISTRIBUTED PROCESSING/DATA COMMUNICATIONS		PLANNING & APPLICATIONS	Session 5.3 page 18 Organizing a Large Corporation for Office Automation
TUESDAY AM	Session 1.6 page 10 Long Range Planning for Data Communications	Session 1.5 page 10 Project Management Techniques and Standards for EDP		Session 2.2 page 13 Interactive Graphics—New Approaches to Data Analysis for Management Planning and Decision Making	Session 1.6 page 10 Long Range Planning for Data Communications Session 2.4A page 13 Converting to Distributed Data Processing—Prerequisites, Planning, and Control. Part 1 of 2		Session 5.7 page 19 The "1980 Office"—A View from the Top Session 5.9 page 20 Matching Word Processing Configurations to Organizational Structures Session 5.8A page 19 Getting Started in Word Processing	Session 5.9 page 20 Matching Word Processing Configurations to Organizational Structures
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IMPORTANT

Please note that some sessions that are only given *once* are repeated in several sections. For example, Session 1.1, *Crossroads in Information Management* is listed in four different sections: *Information Management, advances in Information Technology, Office Automation*, and *Small Business Systems*.

This is a keynote session of prime importance to corporate executives; DP managers, administrative and office managers, and small businessmen, so it is repeated in all sections that are specifically oriented towards each of these groups.

dule at a Glance . . .

	OFFICE AUTOMATION		SMALL BUSINESS SYSTEMS	FINANCIAL & MARKETING	INDUSTRY-ORIENTED SESSIONS			
	ELECTRONIC MAIL	ADVANCES IN TECHNOLOGY			MANUFACTURING	BANKING	INSURANCE	HOSPITALS
Mon. a.m. continued			Session 1.1 page 1[illegible] Crossroads in Information Management Session 1.2 page 1[illegible] New Opportunities for the DP Manager					
Mon. p.m. continued	Session S.4 page 18 OCR in Office Automation Session S.S page 19 Trends in Information Storage for Office Automation	Session 5.4 page 18 OCR In Office Automation Session 5.5 page 19 Trends In Information Storage for Office Automation	Session 4.1 page 16 What You Need to Know to Achieve a "No-Nonsense," Profitable, and Successful System	Session 8.1 page 22 Economic and Business Forecasting in "What-If" Planning				
Tues. a.m. continued	Session S.10A page 20 Progress in Electronic Mail. Part 1 of 2		Session 4.2 page 15 For the User Who Has a Small Business Minicomputer System—What's Next?	Session 8.2 page 22 Information Systems for Budgeting and Annual Planning and Review				
Tues. p.m. continued	Session 5.10B page 20 Progress in Electronic Mail. Part 2 of 2		Session 4.3 page 15 Prepackaged Software for Small Business Minicomputer Systems	Session 8.3 page 22 Strategic Planning and "What-If" Planning Models	Session 12.1 page 23 Trends in Manufacturing Information Systems Session 4.3 page 15 Prepackaged Software for Small Business Minicomputer Systems			
Weds. a.m. continued	Session 5.17 page 21 Trends in Photocomposition Systems for the Word Processing Environment	Session 5.17 page 21 Trends in Photocomposition Systems for the Word Processing Environment		Session 9.1 page 23 Marketing Information Systems in Consumer Organizations	Session 12.2 page 23 Evaluation and Assessment of Distributed Data Processing in the Manufacturing Environment	Session 16.1 page 26 Evaluation and Assessment of Distributed Data Processing in Banking Session 16.2 page 26 Management Information Reporting and Profitability Systems in Banking	Session 14.1A page 24 On-Line Insurance Applications—Case Studies	Session 15.1 page 25 Managing the EDP Resource—A Top Down View for Hospital Management
Weds. p.m. continued		Session 5.19 page 21 Report on Word Processing Systems 1978	Session 4.4 page 16 What the Small Business Executive Needs to Know About Small Business Computer Systems Before Commitment		Session 12.3 page 23 Trends in Systems for Materials Management and Production Planning in a Manufacturing Organization	Session 16.3 page 26 Office Automation in Commercial Banks	Session 14.1B page 24 Insurance Network Directions and Survey	Session 15.2 page 25 Making Effective Use of the Hospital Financial System for Management Planning and Decision Making
Thurs. a.m. continued			Session 4.5 page 17 Clinical Treatment of Common Problems in Installing Your First Small Business Computer System		Session 12.4 page 23 Trends in Systems for Order Entry and Distribution in Warehousing and Manufacturing Organizations	Session 16.4 page 27 Systems Options for Trust Management and Trust Profitability Session 16.5 page 27 Trends in System Development for International Banking	Session 14.3 page 24 Office Automation in the Insurance Industry	Session 15.3 page 25 Word Processing to Streamline Office Operations in Hospitals
Thurs. p.m. continued					Session 12.5 page 24 Distributed Financial Systems in the Manufacturing Environment	Session 16.6 page 27 Impact of Technology on the Banking Industry in the 1980's	Session 14.4 page 24 System Integration—A Management Strategy for Insurance Company Operations of the 1980's	Session 15.4 page 26 Patient Information Management Systems—1978 and Beyond

Session to Show How to Get 'Best Fit' Mini

By Tim Scannell
CW Staff

CHICAGO — Far too many executives considering one type of minicomputer system in a veritable circus of offerings often fail to see beyond the "greasepaint" and settle for something more attractive than functional.

"The businessman has to have some understanding of what he's asking for," John Morris, principal of Morris Consulting, explained. "First, he should define his requirements, and in some general way he should have enough knowledge to be able to evaluate those requirements in terms of the demand they will eventually put on the system."

Morris will share his views on choosing and setting up a "no-nonsense," profitable and successful small business minicomputer system today at Info '78 — a four-day information and management event here at McCormick Place. The conference and exposition will cover a variety of management-related topics and is scheduled to run through Thursday.

Morris contends the opportunities for acquiring effective and easy-to-use systems are abundant but, contrary to most executive's belief, there are no shortcuts.

Before Vendor Contact

"The most important thing is for a businessman to sit down and define his own requirements without the aid of a computer firm coming in and telling him what he wants," Morris stated.

A potential user should also have a firm understanding of the minicomputer's potential and, ideally, a written document highlighting his needs in relation to what the system can deliver. "Without a written document," Morris observed, "and with just a 'back-of-an-envelope'-type description," the typical businessman will undoubtedly get into trouble "going after a turnkey-type computer system."

Although there are a number of different systems and an even greater number of vendor claims about system power and flexibility, all minicomputer systems are basically the same, Morris said. "When somebody is looking at a system, the difference in the hardware might vary, but really not too much."

Hardware should be the least important user consideration when choosing a business minicomputer system, "which probably turns around what everyone else is thinking," Morris claimed.

'Inverse-Priority' Approach

A potential small business user, constrained by limited funds and usually a limited knowledge of DP, should adopt an "inverse-priority" approach during the selection process. The types of application software available and how effectively it is written should be top priorities for scrutiny and hardware should be considered last, Morris noted.

"There are different approaches to application programs that can make a difference of 20 or 30 to 1," Morris remarked.

"I'm evaluating the guys that are doing the applications software first, seeing what type of packages they have, examining their approach and evaluating what type of quality they can produce. Then I worry about the operating system, making sure it's adequate and can handle the types of things I need for my specific jobs," Morris continued.

Morris's workshop, essentially "a three-day course condensed to three-hours," will cover six areas of minicomputer acquisitions and usage: defining the information requirements; estimating computer capacity requirements; evaluating the approaches and cost benefits; developing systems specifications; planning the transition to the new system and understanding people requirements; and setting guidelines for system implementation.

Despite Myth, Chicago Not Windiest City

CHICAGO — Those traveling here for Info '78 might like to know that the average temperature of this city in October is 54.5°F — 11° colder than September. But to dispel a popular myth, it it not the most windy city. That honor belongs to Sandberg, Calif., according to Robert Lautzenheiser, who heads the New England Climatic Service in Reading, Mass.

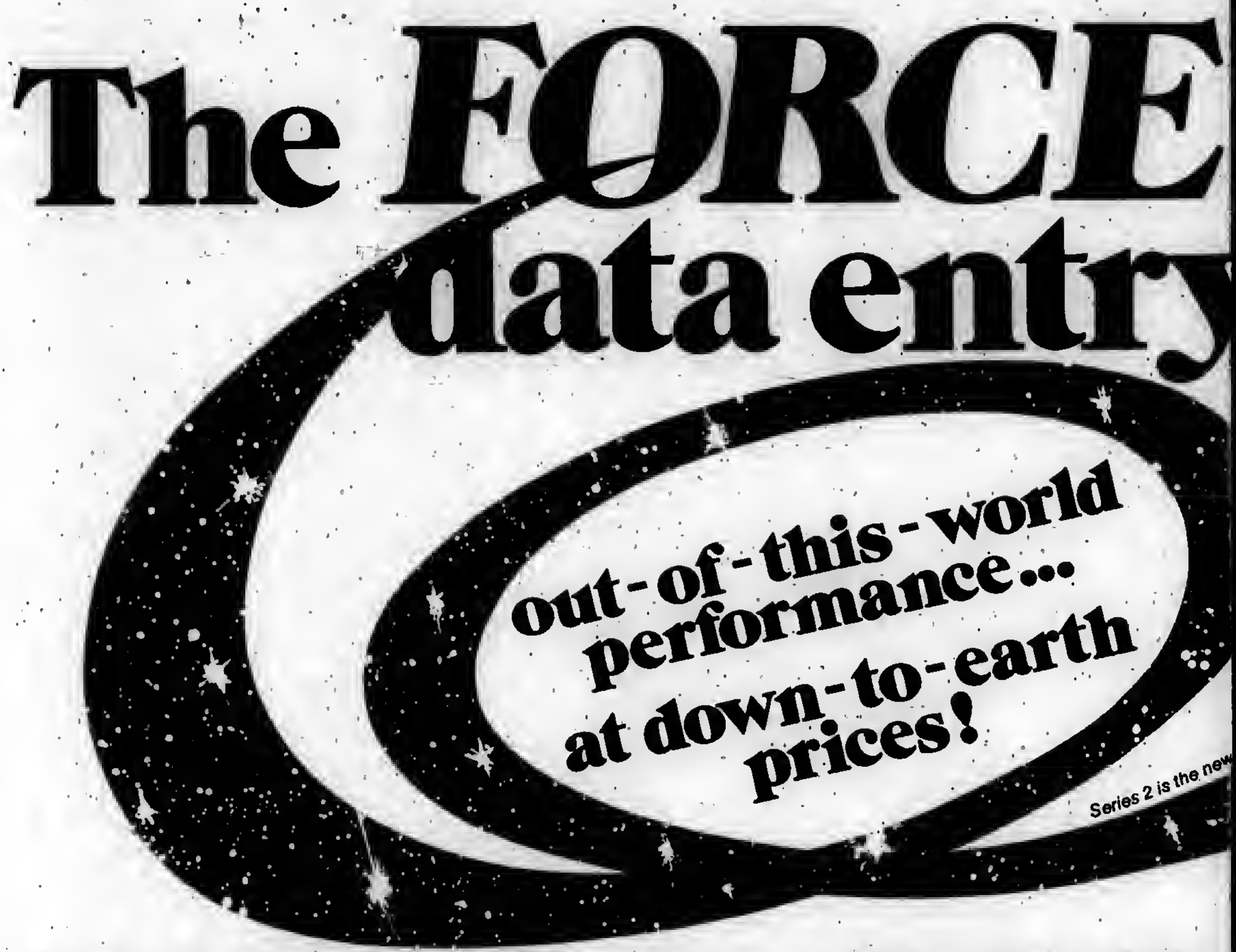
According to Lautzenheiser, Chicago is 67th out of 250 cities in 49 states, not including Alaska, for which the National Weather Service has maintained mean annual wind speeds for a long period of time.

The annual mean wind velocity in Chicago is only 10.4 miles per hour. Sandberg's is 15.4 miles per hour, he said.

The weather guru is a former state climatologist for the Department of Commerce's National Weather Service and still does work for that organization from time to time.

With a 1970 population of 3,369,359, Chicago is the second largest city in the U.S. — second only to New York.

In addition to its multimillion-dollar annual convention business, Chicago is known for being a major industrial, commercial and transportation center. Its airport — O'Hare — has been called the busiest in the world.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Playing Hooky? There's Plenty to Do in Chicago

CHICAGO – For those with a yen to play hooky for a day, this town is replete with things to do.

At the top of the list is The Art Institute of Chicago, a museum whose collection of impressionist paintings has few rivals. Located at Michigan and Adams, the institute also has a number of interesting temporary exhibits – "Theatrical Prints by Torii Masters," "The Athlete"; Ivan Albright; and "Pompeii AD 79."

Also on display are collections of quilts; Japanese prints and ceramics; French and Italian drawings; "The Rake's Progress" and "The Blue Guitar"; 17th Century Italian prints and drawings and "Drawings 1900-1976."

Museum hours are 10:30 a.m. until 4:30 p.m. Monday, Tuesday, Wednesday and Friday and 10:30 a.m. until 9 p.m. on Thursdays. Admission is free. On the weekend, there is a $2 admission fee. For more information, the institute can be reached at 443-3500.

• • •

On a less aesthetic level, there's the Chicago Police Department at 1121 S. State St. that boasts the "world's most advanced" headquarters. Tours for 15 or more incude the communications center, crime lab and DP departments.

Reservations are necessary. Telephone number there is 744-5574.

• • •

The *Chicago Tribune*, at 435 N. Michigan Ave., gives tours of its printing plant, one of the largest in the world. Tours are Monday through Friday from 9:30 until 11 a.m. and 1:15 until 2:45 p.m.

Advance reservations are required. Contact the newspaper's public service office at 222-3993.

• • •

DPers interested in Frank Lloyd Wright can take a walking tour of Unity Temple and the exteriors of 13 Wright-designed residences in Oak Park. The tour leaves Unity Temple at 2 p.m. on Sundays and costs $2. For more information telephone 326-1393.

• • •

Glessner House at 1800 S. Prairie is an architectural landmark designed by Henry Hobson Richardson in 1885. It boasts a collection of Frank Lloyd Wright and Issac Scott furniture.

The building is open for tours every half hour on Tuesdays, Thursdays and Saturdays from 10 a.m. until 4 p.m. and 1 p.m. until 5 p.m. on Sundays. Admission is $1 and the telephone number there is 326-1393.

• • •

Old Chicago, in Bolingbrook, Ill., is advised as "the world's only indoor amusement park and 1890s shopping towne." It has rides, an international circus, a laservisions light concert and a fun factory.

Old Chicago is open daily. Admission is $5.75 for adults, $4.75 for children. Group rates are offered. For more information telephone 759-1895.

• • •

The Chicago Academy of Sciences at 2001 N. Clark features a coal forest, a rain forest, tree trail to Indian dunes, a walk through a canyon and a walk through a cave. For more information call LI 9-0606.

• • •

The DuSable Museum of African American History at 740 E. 56th Place in Washington Park is open Tuesday through Friday, 10 a.m. until 4 p.m. and noon until 4 p.m. on Saturday and Sunday. Tours are by appointment and cost 50 cents. Telephone 947-0600.

• • •

The Field Museum of Natural History at Roosevelt Road at So. Lake Shore Drive is featuring an exhibit of "Nonmodern Moneys of the World," "Imperial China Photos" and a "Bugaku," a live Japanese music and dance performance, on Oct. 16..

Also to see there is a Pawnee earth lodge. Tours are 9 a.m. to 5 p.m. daily. Call 922-9410.

• • •

The International Museum of Surgical Science and Hall of Fame at 1524 Lake Shore Drive maintains an exhibit of surgery developments in three countries. It is open Tuesday through Sunday, 10 a.m. until 4 p.m. Telephone 642-3632.

• • •

The Museum of Contemporary Art, at 237 E. Ontario, is featuring "The Reborn Building: New Uses, Old Places." Telephone WH 3-7755.

• • •

The Museum of Science and Industry at 57th and S. Lake Shore Drive, is featuring exhibitions on "Chinese Culture in Focus," "Clocks," "Chicago Spacewatch," "Coal Energy," "Chicago," "Man in Flight" and the "Nobel Hall of Science."

Museum hours on weekends are 9:30 a.m. until 4 p.m. On weekends and holidays, hours are until 5 p.m. Admission is free. Telephone MU-4 1414.

• • •

At the Polish Museum of America, at 984 N. Milwaukee, the culture and folk art of Polish people in America is on display.

The museum features biography, an art gallery, archives and a library.

Admission is free and the museum is open daily until 4 p.m. Telephone 384-3352.

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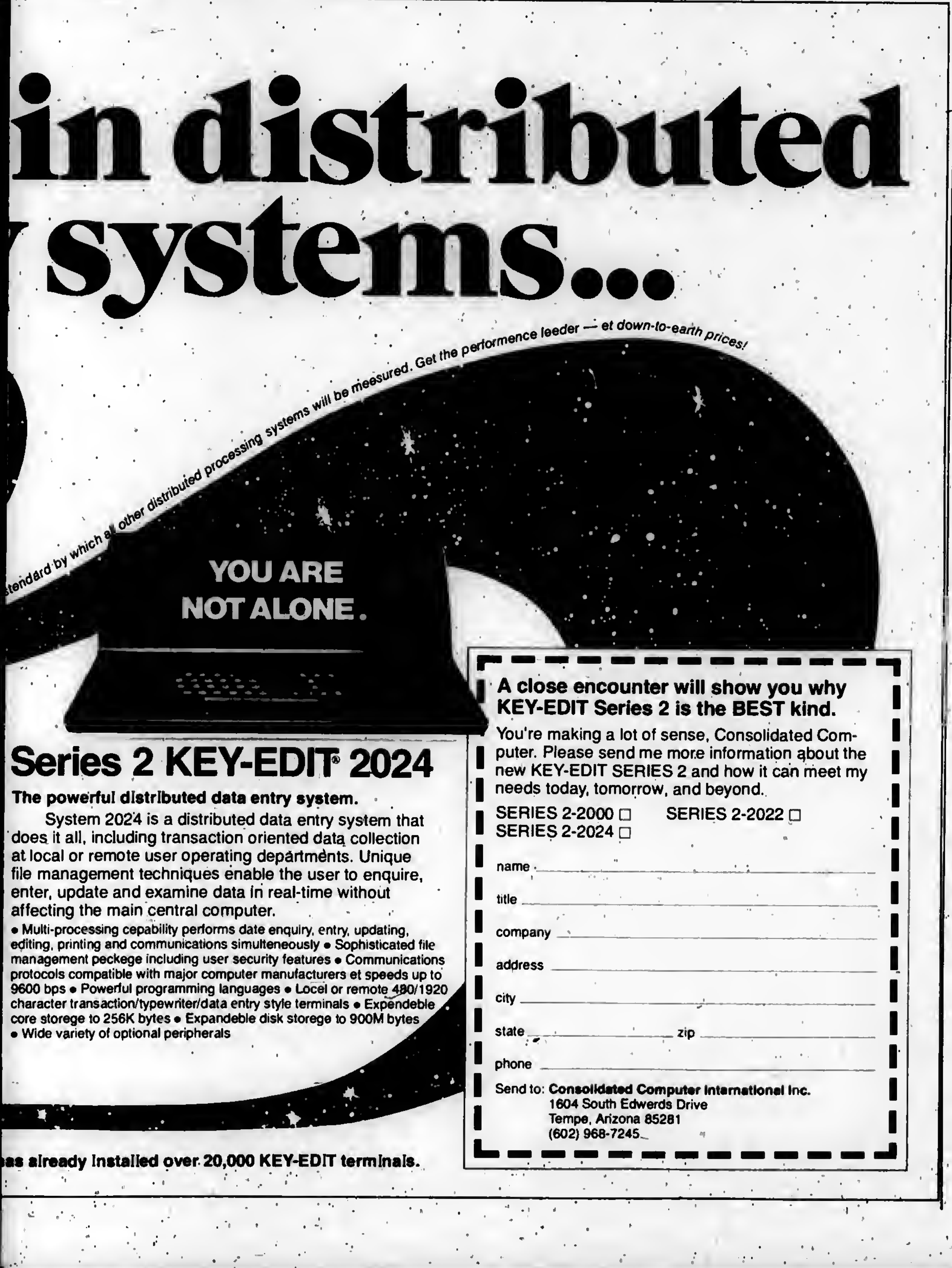
The Royal London Wax Museum at

(Continued on Page Info/10)



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Continental Plaza Hotel, Consort Room, Mich & Del., 943-7200

Grogshop, Prudential Plaza, 642-7676

Marriott's Lincolnshire Resort, Milwaukee Ave. & Halfday Road, Lincolnshire - The Main Brace, 634-0100

Martinique Restaurant, 2500 W 94th Pl, PR9-4000

Playboy Club, 919 N. Michigan, 751-8110

Pick-Congress, Uncle Albert's, 520 S. Michigan, 427-3800

Sheraton-Chicago, The Meet Market, 505 N. Michigan Ave., WH4-4100

Top of the Hilton, Arlington Park Hilton, Arlington Hts, 394-2000

DINING

Allgauer's Fireside Rest, 2855 N. Milwaukee Ave., Northbrook, 541-6000

Ambassador East Hotel, 1300 N. State St., 787-7200

The Arbor, Sheraton-North Shore Inn, 933 Skokie, Northbrook, 498-6500

The Bakery, 2218 N. Lincoln, 472-6942

Benihana of Toyko, 166 E. Superior, 664-9643

Berghoff, 17 W. Adams, HA 7-3170

Binyon's, 327 S. Plymouth Ct., 341-1155

Blackhawk, 139 N. Wabash, 726-0100

Bollings Sample Room, Merch Mart, 2nd fl, MI2-4879

Bumbershoot, Ascot House, 1100 S. Michigan, 922-2900

Celebrity Room, Arlington Park Hilton, Arlington Heights, 394-2000

The Chalet, Bismarck Hotel, 171 W. Randolph, CE 6-0123

Chelsea Grill, The Whitehall, 105 E. Delaware, 944-6300

Chicago Marriott-Allie's Bakery, LaPlaza, JW's, 4th Level, 540 N. Michigan Ave. 836-0100

Churchill Restaurant and Lounge, 535 N. Michigan, 329-9020

Club ElBianco, 10067 Skokie Blvd., Skokie, 583-1363

Continental Dining Room, Elmhurst Inn Best Western, 279-0700

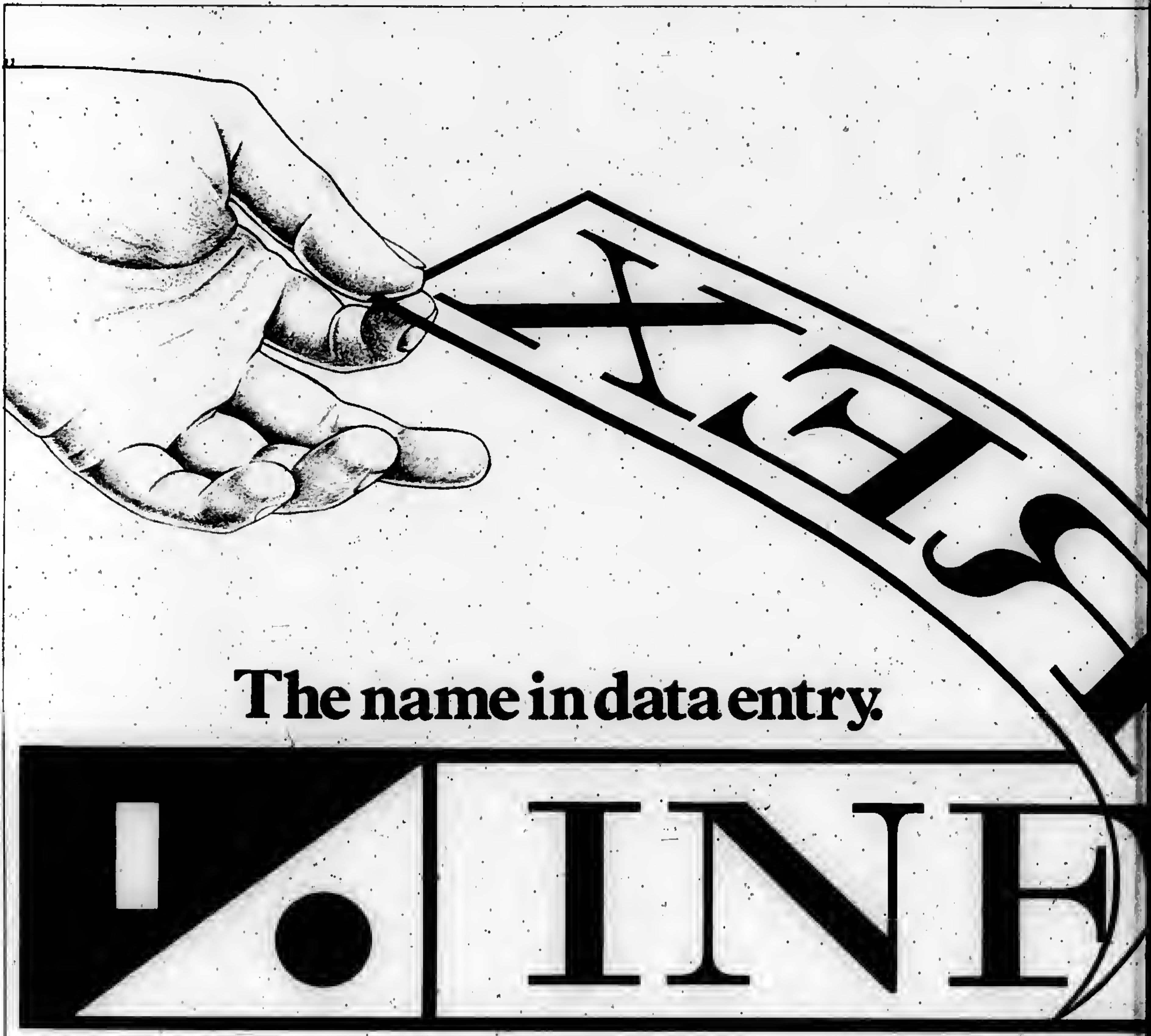
Continental Plaza-Chelsea Restaurant, Lion Bar, Mich. & Delaware, 943-7200

Dingbat's, 247 E. Ontario, 751-1337

The Drake, Avenue One, Lake Shore Drive & Michigan, SU7-2200

Eli's The Place for Steak, 215 E. Chicago, 642-1393

Haymarket Restaurant, The Conrad Hilton, WA2-4400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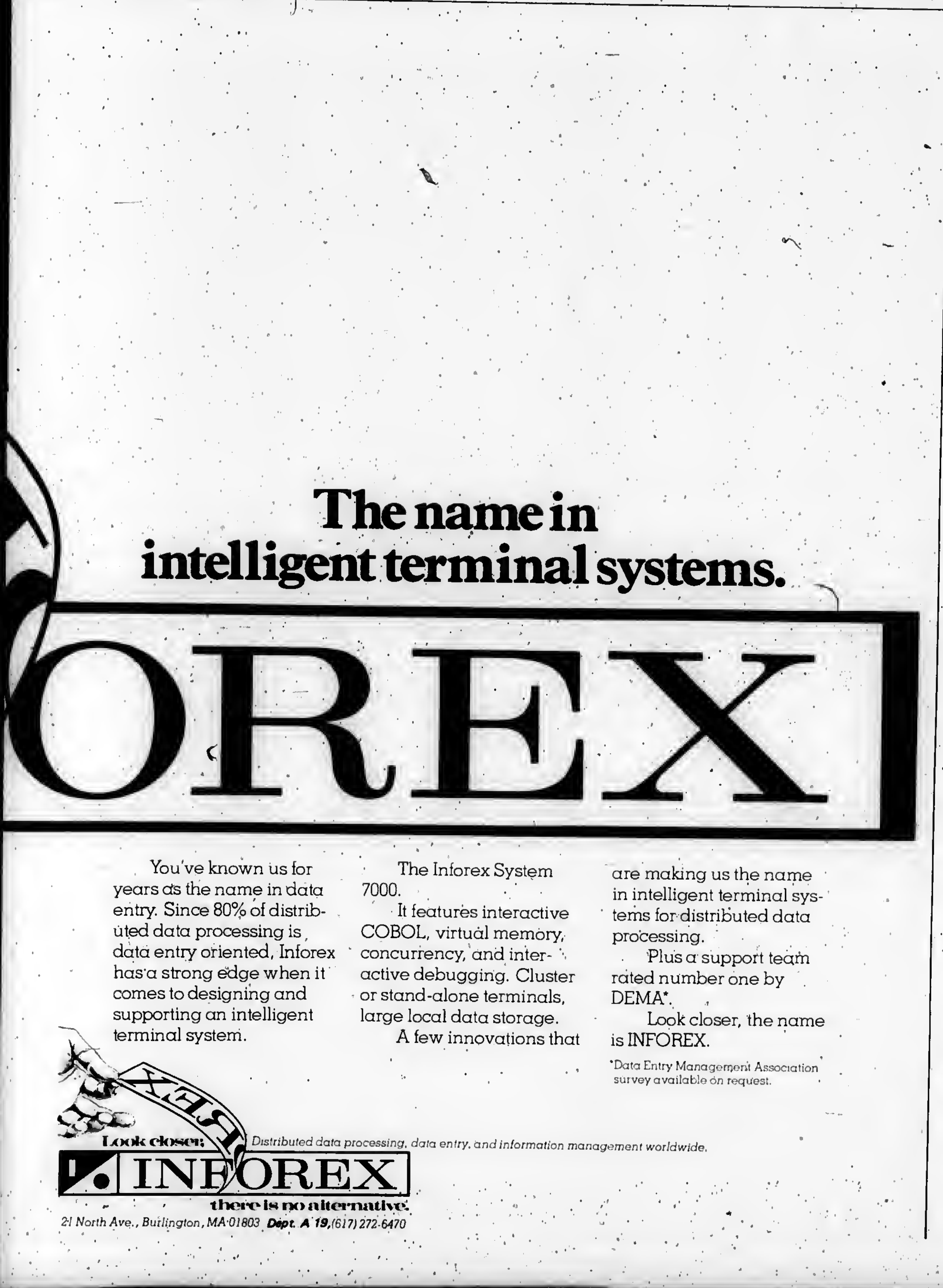
Restaurants

Henrici's Mart Restaurant, Merch Mart, 644-1710
Henrici's O'Hare Inn, Mannheim & Higgins, 299-6681
Hugo's Hyatt Regency O'Hare, Kennedy Expressway at River Road South, 696-1234
Hugo's Water Tower Hyatt House, 800 N. Mich, 943-5600
Hyatt Regency Chicago-Mrs. O'Leary's, Truffle's, 151 E. Wacker Drive, 565-1000
Italian Village, 71 W. Monroe, DE2-7005
Jacques French Restaurant, 900 N. Michigan, WH 4-4795
Knight's Hearth Holiday Inn of Oak Brook, 17 W, 350 22nd St., Villa Park, 833-3600
Kona Kai, Marriott Motor Hotel, Kennedy Expressway at Cumberland, 693-4444
Kon-Tiki Ports, Radisson-Chicago, 505 N. Michigan, 527-4286
Langtry's 973 Waukegan Road, Glenview, 724-8904
L'Escargot, 2925 N. Halsted St., 525-5525
Le Boef — Galeon — White Forest Chateau, 787-0001
Long Johns Pub, First National Plaza, Dearborn & Monroe, 263-1800
Marriott's Lincolnshire Resort, Milwaukee Ave. & Halfday Road, Lincolnshire — The King's Wharf. 634-0100
The Mavin, Allerton Hotel, Michigan & Huron, SU 7-4200
Maxwell's, The Westbury, 160 E. Huron, 787-2900
Miller's Pub, 23 E. Adams, 922-7446
Nikos, 7600 S. Harlem Ave., Bridgeview, 496-0300
O'Hare Hilton-O'Hare Room, Balkan Grill, O'Hare Airport, 686-8000
Oval Room, Executive House, 71 E. Wacker Drive, FI6-7100
Pick-Congress-Royal Scotts Grill, Tipperary Inn, 520 S. Michigan, HA7-3800
The Pinnacle, Holiday Inn, 644 N. Lake Shore Drive, 943-9200
Theatre Club, McCormick Place, 791-6300
Ron Briskman's Hideout, Inc., 17 N. Wabash Ave., 372-2526
Royal Hearth, Ramada Inn, Congress & Canal, 427-6969
Scandinavian Room, Carson Inn, Nordic Hills, Itasca, 625-6116
Gibraltar Room, 642-7676 — Oakbrook Inn, 654-2800
Toffenetti's, 72 W. Randolph, DE2-8270
Trader Vic's Palmer House, State & Monroe, RA 6-7500
Wing Hoe Cantonese Food, 5356 N. Sheridan Road, 275-4550
Wrigley Building Restaurant, 410 N. Michigan, WH 4-7600



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It features interactive COBOL, virtual memory, concurrency, and interactive debugging. Cluster or stand-alone terminals, large local data storage.

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All of Chicago's a Stage Even If It's Not Broadway

CHICAGO — When it comes to theatre, Chicago's no Broadway. It's no small town either.

At the Arie Crown Theatre, right in McCormick Place, Eartha Kitt will be appearing in "Timbuktu." Telephone 791-6000 or 791-6190 for ticket information.

"Beatlemania" an extravaganza put on by four Beatles imitators, is featured at the Blackstone Theatre at 60 E, Balboa. The telephone number there is 977-1700.

At Drury Lane South, located at 2500 W. 95th St., Evergreen Park, Forrest Tucker is starring in "Patches," a comedy. Telephone 779-4000.

Eve Arden is appearing in "Most Marvelous News" at the Drury Lane East, also at McCormick Place. Telephone 791-6000,

"I Love My Wife," starring Brad Blaisdell, Leslie Denniston and Jerry Lanning, is being put on at the Drury Lane Water Town Place at 175 E. Chestnut. Call 266-0500.

At the Goodman Theatre, 200 S. Columbus Drive, "Native Son" by black playwright Richard Wright is being presented. Meshach Taylor plays Wright in an autobiographic tale about a black man who moves to Chicago from a small southern town. Telephone 443-3822.

Ken Berry is appearing in "Guys and Dolls" at Marriott's Lincolnshire Theatre in the northwest suburbs. Telephone 634-0200.

"The Fifth of July" is being presented at the St. Nicholas Theatre at 2851 Halstead. It features Joan Allen, H.E. Baccus and Moira Harris. Call 281-1202.

Finally, "A Hat Full of Rain" is at the Theatre Building at 1225 W. Belmont. Telephone 327-5252.

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Windy City Has Plenty to See

(Continued from Info/7)

1419 N..Wells contains more than 100 life-sized figures of famous people. The museum is open daily from noon until 9 p.m. except Friday and Saturday, when it remains open until midnight. Telephone 337-7786.

The Telephony Museum at 225 W. Randolph displays early and modern equipment including satellite communications. The museum is open weekdays from 10 a.m. until 4 p.m. Admission is free. Telephone 727-2994.

•••

The Adler Planetarium at 1300 S. Lake Shore Drive is showing "Birth of the Universe" Monday through Thursday at 2 p.m. and Friday at 2 and 8 p.m. Admission for adults is $1.50.

Exhibit hours are Monday through Thursday from 9:30 a.m. until 4:30 p.m.

•••

Chicago supports two zoos. Brookfield, at First Ave. and 31st St., has Australia House, baboon islands, bear grottoes, a primate house and a lion house. There are daily porpoise shows at the Seven Seas Panorama.

The zoo is open until 6 p.m. daily. Admission for adults is $1.50. Telephone 242-2630.

Lincoln Park, located at 2200 North, in Lincoln Park, is a 35-acre tract housing a collection of 2,400 mammals. birds and reptiles. It's open from 9 a.m. until 5 p.m. Admission is free. For information call 294-4671.

Info: a Wealth Of Exhibitions

(Continued from Info/1)

thusiasm for the show not only reflects good economic times in the industry, but also the fact that Info has come of age, Wolcott observed.

Session topics at the show include "Prepackaged Software for Small Business Minicomputer Systems," "New Opportunities in Communications Security," "Steps to a Successful Small Business Computer System," "Organizing a Large Corporation for Office Automation" and "Techniques in Data Base Administraiton."

IN DEPTH
IN DEPTH
IN DEPTH

The Software Products Industry: Its Future And Promise

By Martin A. Goetz

Identity and image — that is the most serious problem facing the software products industry today. In the past, software was often given away free, not only by hardware manufacturers but by users as well. Last year, however, software industry revenues were well over $1 billion (with IBM accounting for one-third to one-half), and most forecasts for yearly revenues through 1985 project an annual increase of about 27%.

Just what is the software products industry?

Many people in the computer industry do not view software product companies as manufacturers. But they are, in every sense of the word. This view is based on the fact that software companies develop, market and distribute software products around the world.

This brings up the key point of defining exactly what software is and how a software product differs from a computer program. The controversy surrounding these definitions has dramatically impacted on Wall Street's perception of the growth and development of the software products industry. Let's take a closer look at them.

What Is Software?

Ever since the inception of the software products industry in the 1960s, there has been a great deal of discussion, debate and even confusion concerning the definition of software. This difficulty in defining software, I believe, stems from the very early days of computing, going back more than 25 years — to the early 1950s.

At that time, when private industry began to use computers for business and scientific purposes, no one really understood the importance of computer programming (or software). There was little thought that the program would eventually constitute an investment greater than the hardware itself; hardware was the prime expense, and the value of software was not appreciated.

Software generally emulated current procedures or systems. There was little system design in those early business installations. Software was put in the public domain not only by the hardware manufacturers, but by the users, who freely made their software available through user group libraries.

Very few people believed that software would have a long life — or that the cost of software maintenance could ultimately be many times the cost of the original software development.

High Points of '60s

During the 1960s, as second- and third-generation computers become more complex, the generalized software given away by the manufacturers became more and more difficult to use. It was during this period that the user began to realize the importance and critical nature of software.

It was also during this period that:

1. Some companies began to sell software products.
2. The Justice Department began to investigate whether giveaway software was an illegal tie-in sale.
3. There were technical conferences on software which addressed its engineering, design and reliability.

Since 1969, and with the advent of unbundling, the question of "what is software?" has been getting more persistent. The question is today being asked by:

- Financial people when analyzing a corporation's assets and liabilities.
- State and federal tax authorities when viewing new revenue sources, especially sales tax and personal property taxes.
- The Internal Revenue Service when considering the investment tax credit question.
- The Copyright Office when deciding whether software comes under its jurisdiction.
- The Patent Office when deciding whether the inventive concepts in a program constitute patentable subject matter.
- Lawyers when drawing up contracts.
- Judges when deciding cases involving ownership of software.
- The State Department when licensing and exporting high technology to the Eastern Bloc countries.
- The Justice Department in the current U.S. vs. IBM antitrust case.

Today, because of the large amount of money at stake, the definition of software often seems to vary based on the various economic interests of the parties involved.

Through the years, I've developed a point of view on the nature of software that is a technical one — a viewpoint that I believe can be fully defended. Simply stated, a computer is a machine comprised of many components, and *software is one of the machine components of a computer system.* This view is based on the following facts: Software operates as an integral part of a computer system; software programs are interchangeable with hardware circuitry; and software is interchangeable with firmware.

Thus, software is a component of a computer system just as a computer circuit, terminal or disk is a component. Figure 1 gives an example of the hardware and software components that make up a computer system.

Packages vs. Programs

To differentiate between a software package and a computer program, let me list some of the significant, distinctive features of each. First, software packages:

1. Software packages are priced, guaranteed and maintained via a formal, legal agreement between the buyer and the seller.
2. Documentation for a software package must be produced at all levels — for the buyer, for the manager, for the technician and for inexperienced as well as experienced personnel.
3. Software packages inevitably face competition and, therefore, must be evaluated continuously in terms of efficiency, price, ease of use, usefulness and so forth vis-a-vis its competition.
4. Software packages can be utilized by a large number of users for a price which reflects only a small part of the total development cost.
5. Software packages are field-tested by many users before they are actually bought by the typical user.
6. Software packages are maintained

(Continued on In Depth/9)

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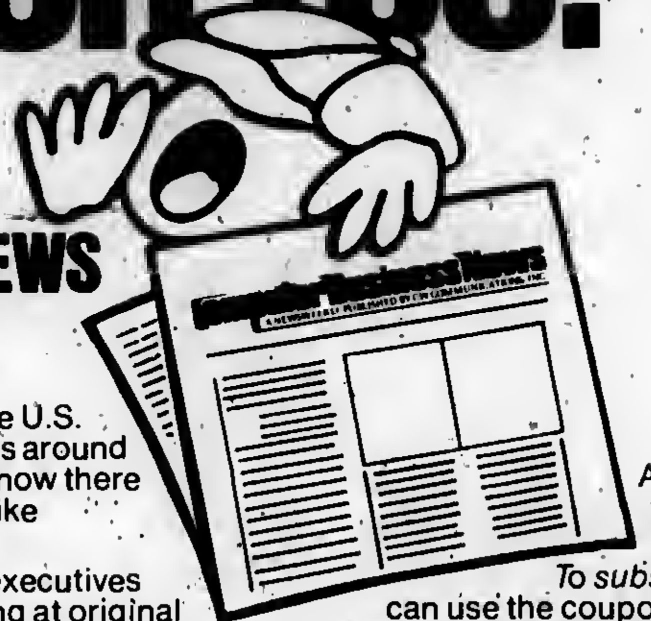

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Starting November 6th, America's fastest-growing industry will have its own weekly newspaper, **Computer Business News**. As publishers of **Computerworld**, one of the most successful business publications in the U.S. —as well as several other leading computer publications around the world—we know the computer business. And we know there is a strong and growing need for a weekly newspaper like **Computer Business News**.

Computer Business News will be edited to serve key executives in management, engineering, production and marketing at original equipment manufacturers, systems houses, distributors, representatives, internal systems groups at large end users and other multiple unit buyers of computer products and services. According to International Data Corporation, the world's leading EDP market research firm, this marketplace is over $4 billion now, and should grow rapidly to $9 billion in 1981! So the need for good, up-to-date information is especially important.

Every week it will provide all the computer news—and nothing but computer news—in a way no other publication can match.

Computer Business News' newspaper format, high-speed printing and rapid, paid-circulation distribution system will have unique advantages for both readers and advertisers.

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This material will be researched and prepared by an experienced, professional staff, led by Editor W. David Gardner, a well-known, respected computer industry reporter and analyst. Dave will maintain editorial offices in New York and Palo Alto, to make sure of complete, late-breaking coverage of both coasts—with his main office at 420 Lexington Ave., Suite 2354, New York City, NY 10017 (212) 867-5054.

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Computer Business News

Hewlett-Packard ends the computer compromise.

The HP 250

The lowest-priced computer with true data base management, the HP 250 was designed to be simple both to program and operate. The keyboard is like an electric typewriter, the numeric pad like an adding machine, and the CRT adjusts vertically and horizontally for comfortable viewing.

Eight soft keys underneath the screen can be programmed to lead the user through each task step-by-step. They'll also help you cut corners in writing applications software, especially when working with the other tools we provide—IMAGE/250 DBM and its inquiry scheme QUERY/250, FORMS/250, and REPORT WRITER/250.

The system can accommodate four terminals and has up to 256K bytes of main memory. You can also get up to three flexible discs, or one flexible plus one fixed disc, built right into the unit. (Total storage can expand to 40 megabytes.) A self-test system and easy maintenance of the CPU and memory boards, all on a roll-out chassis, are two more features of this exceptional computer.

Another is the price: it starts at just **$24,500.**

The HP 300

Virtual memory, silicon-
an Integrated Display System gi
a very compact frame.
It can handle up to 16 us
megabyte of main memory and
do transaction processing and sc
control every application from th
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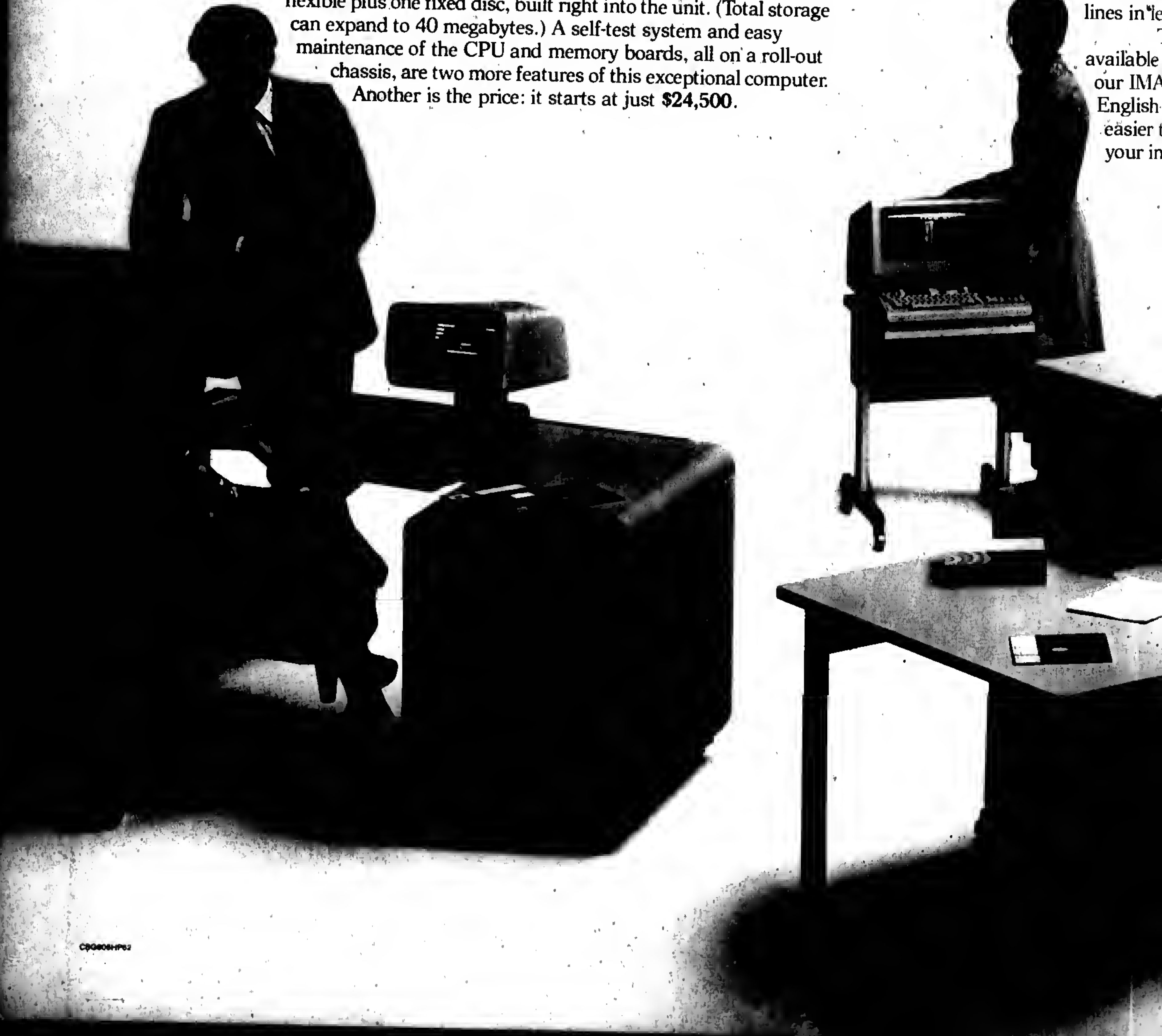

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the display itself divides into multiple
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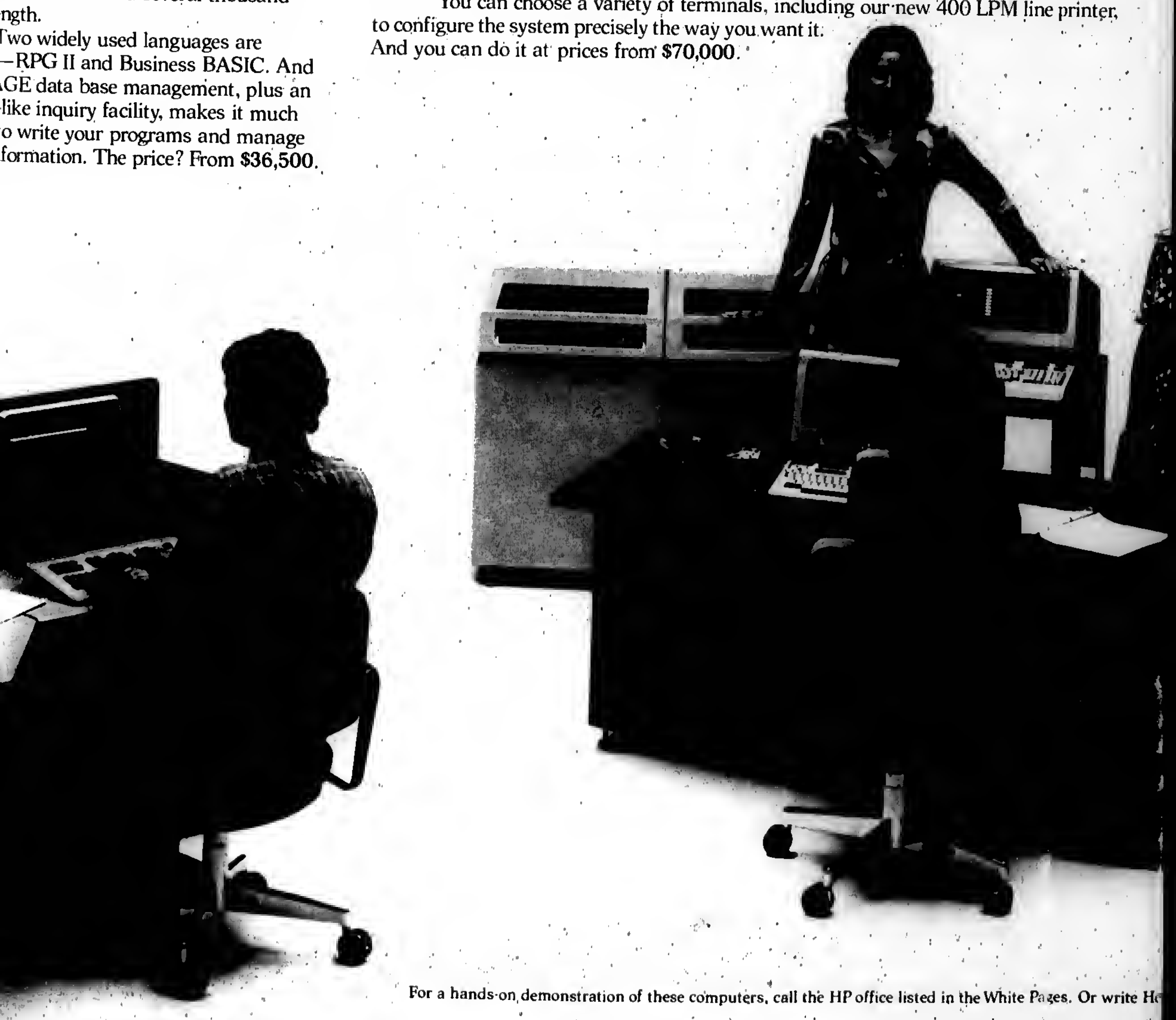
ngth.
Two widely used languages are
—RPG II and Business BASIC. And
GE data base management, plus an
like inquiry facility, makes it much
o write your programs and manage
formation. The price? From **$36,500.**

The HP 3000 Series 33

The latest addition to the HP 3000 family, the Series 33 also uses SOS to pack a lot of power into a simple desk unit. Designed for multiple users at remote terminals, the system can expand to a megabyte of error-correcting main memory, and grow to 960 megabytes of disc storage. It offers both the operating system (MPE III) and IMAGE data base management that set the HP 3000 line apart from other interactive computers.

The basic system consists of the CPU (now on three chips totaling less than one square inch instead of 700 square inches of PC boards), 20 megabytes of cartridge disc storage, a double-sided flexible disc with one megabyte capacity, and a microprocessor-based console that doubles as a service 'window' on the system, with a plug-in self-test cartridge that runs a complete check in less than two minutes. (It can even be done remotely via a modem.)

You can choose a variety of terminals, including our new 400 LPM line printer, to configure the system precisely the way you want it.
And you can do it at prices from **$70,000.**



For a hands-on demonstration of these computers, call the HP office listed in the White Pages. Or write H

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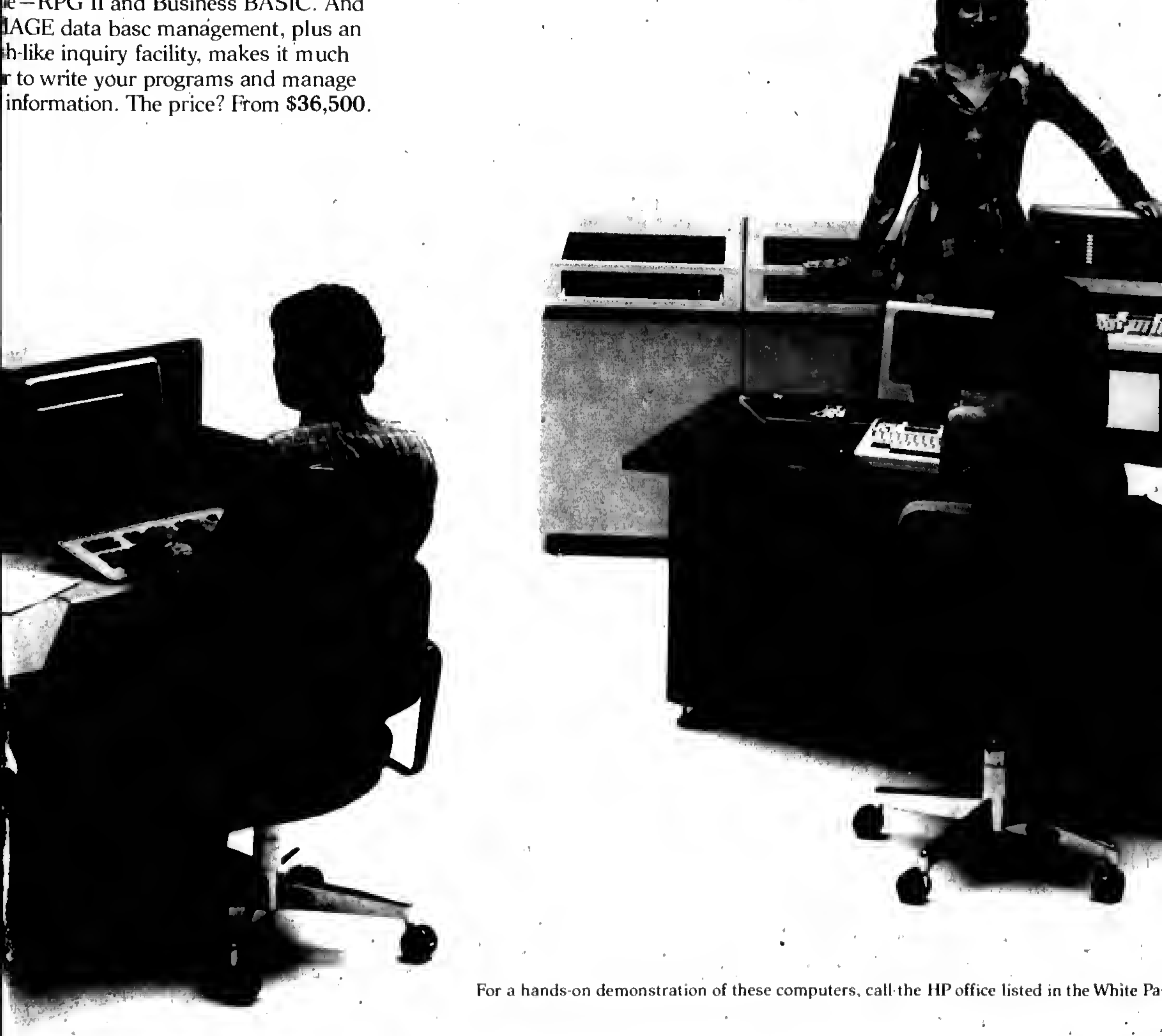

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The HP 3000 Series III

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The top of the line HP 3000 Series III offers more power than the Series 33, while sharing the same powerful operating system and data base management. It has six high-level languages (COBOL, RPG, APL, FORTRAN, BASIC and SPL), as well as networking and manufacturing software* for inventory control and materials planning. And 16K RAM semiconductor memory is available for the unprecedented price of $32K per megabyte.

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*Available in U.S. only

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THE SOFTWARE PRODUCTS INDUSTRY

(Continued from In Depth/1)

by the vendor.

7. Software packages are enhanced to incorporate the latest state-of-the-art features.

On the other hand:

1. Computer programs are not guaranteed.
2. Computer programs are usually designed for a particular user and application.
3. Computer programs are significantly more expensive to build than an equivalent package — usually by a factor of 20 or more.

Wall Street's Perception

Looking back over the last 10 years, we can learn a great deal about the evolution of software companies and Wall Street's perception of them.

Between 1968 and 1970, there were well over 100 new public issues for companies developing and marketing software products. When IBM announced the unbundling of most of its software in 1969, many believed a new and highly profitable industry was about to explode — and Wall Street was enamored with the high profit potential for these companies.

In fact, Wall Street interests drove the market price of software stocks unbelievably high. But the high multiples of 40 to 80 or more times earnings were soon reversed and, by 1974, the multiples of those companies which still existed became unrealistically low.

Was Wall Street's timing wrong, or were there basic misconceptions concerning software product companies? It was a little of both.

Certainly the timing was wrong. And the recession of the early 1970s didn't help the embryonic software industry. But the most crucial reason for the failure centered around the unrealistic expectations of many of the software companies and of the Wall Street analysts who religiously followed these companies.

Two significant fallacies of that era were:

1. *There is a short time lag between developing and marketing successful software products.*

Software is a *long-term* investment. It takes at least five years from the conception of a software product to its successful acceptance in the marketplace — one to two years for developing and testing and another three or more years before sales return a profit on the investment.

2. *Software does not require a major effort by marketing and sales forces.*

Prior to 1970, software was bundled, put in the public domain and viewed as free. How naive it was to believe that when software became priced, users would rush to a software company's door to purchase the software. There was also heavy competition in the marketplace, and the key to success became an effective marketing organization coupled with a cost-effective product.

These two expectations were proved by experience to be false, but software product companies do have two inherent financial advantages which have been of continuing interest to Wall Street analysts.

The first advantage, which is not unique to software product companies alone, is the low capital required to produce a copy. There is a strong analogy between software products, computer hardware, calculators and other mass-produced products. While the initial design and prototype can be very expensive, the cost of a copy is extremely inexpensive.

For example, the actual cost of manufacturing computer hardware typically represents about 10% to 20% of the sales price; for a calculator, about 5% (before the price wars); and for software products, between .1% and 5% (depending on the sale price). Thus, the very low production cost of software products is a definite advantage.

But the most profitable, and therefore most advantageous, aspect of a software products company's operation is its unique ability to double and triple its rate of orders (and deliveries) without having to increase its manufacturing plant, equipment, production personnel, assembly lines or testing equipment. No other industry shares this profit phenomenon and advantage.

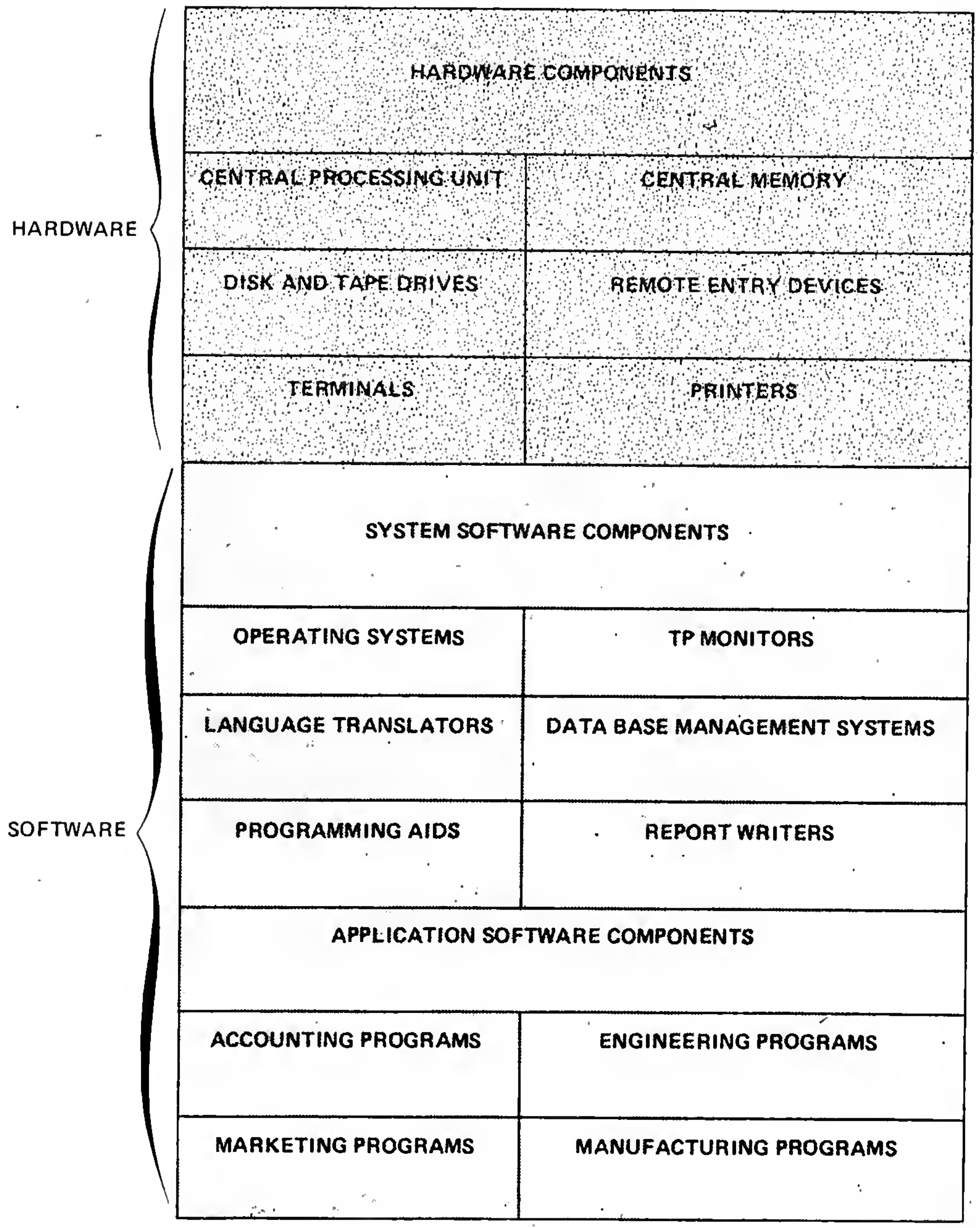
While these two advantages are important to the growth of software product companies, they are, however, important only from the profit potential and from the limited capital outlay required for production facilities. Obviously, capital is still required for personnel expansion — and software products do require highly paid software development engineers.

To build and maintain a strong sales force also requires capital. And, since software is increasingly being leased on a monthly basis, many software companies find they also need operating capital.

Nevertheless, it is obvious today that

(Continued on In Depth/13)

FIGURE 1. MAJOR COMPONENTS OF A COMPUTER SYSTEM



Our "smart" microimage terminal pulls its own weight.

And reduces the strain on your computer.

Nothing reduces the strain on your computer like the Kodak IMT-150 microimage terminal. Because no other microimage terminal "thinks" the way ours does.

The IMT-150 terminal is the first on-line information retrieval terminal from Kodak to incorporate distributed logic into its mode of operation. Blocks of search information from your mini or mainframe computer are "down loaded" to the microcomputer-based IMT-150 terminal in lightning-fast bursts. Then, relying on its own intelligence, the IMT-150 terminal performs real time, on-line information look-ups.

The ability of the IMT-150 terminal to think on its own reduces its dependence on your computer, freeing it for weightier computer tasks. So your EDP operation runs leaner, smoother, more efficiently overall.

There's a lot more to tell about the Kodak IMT-150 terminal. For example, it reduces look-up errors, because it stops at precisely the document you want. There's no backtracking or machine overshoot. It eliminates expensive magazines that require leaders and trailers. It can store more than 10,000 letter-size documents in a 4" x 4" x 1" magazine. And it delivers dry, sharp hard-copy prints on demand.

Want to find out more about how to take the strain off your computer?

Send the coupon. It will bring you everything you need to know about the new Kodak IMT-150 microimage terminal, the microfilm reader-printer that pulls its own weight.

Kodak

The Reducing Machines
Kodak IMT equipment

Eastman Kodak Company
Business Systems Markets Division
Dept. DP8691, Rochester, NY 14650

☐ Please send me more information about Kodak IMT equipment

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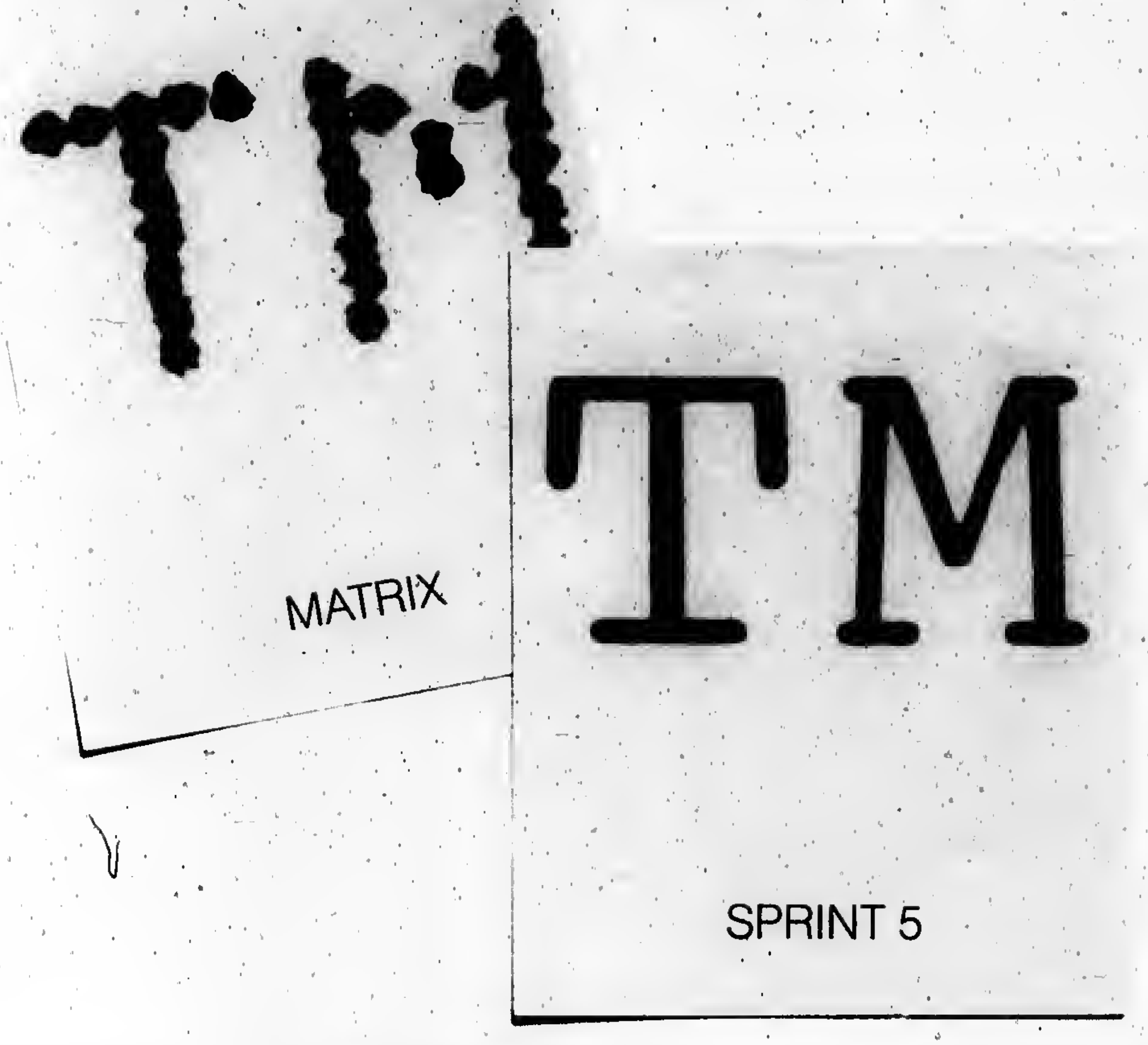

For all those times when you wish your computer could print letter quality, you need a Sprint 5 Daisywheel Terminal from Qume.

Its fully-formed characters are always clear, distinct, eminently readable. (Even after they've been enlarged 1000%.)

Perfect for executive reports, financial statements, and any other application where neatness counts.

But the Sprint 5 does more than give you outstanding print quality. Much more.

Thanks to our dynamic positioning feature, it easily plots, creates graphs, and justifies text. With switch selectable 10 or 12 character per inch spacing.

What's more, Sprint 5 comes with a wide selection of MultiColor™ ribbons including red/black. And over 60 different typefaces.

The Sprint 5 Daisywheel Terminal and RO Printer from Qume. When it comes to dots versus daisies, our advantages are easy to see.

Qume®
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(Continued from In Depth/9)

the profit and growth potential which Wall Street predicted 10 years ago can be a reality for those software product companies willing to make the commitment to adequate product development and a strong marketing and sales effort and support.

The Industry Today

There are many organizations which are developing software packages — some merely as a by-product of their internal DP activities and others "seriously." Examples of some software by-products come from banks which sell in-house banking packages to other banks, industrial firms which offer internally developed, manufacturing-oriented packages and service bureaus which market programs originally offered as a local service.

Those organizations I have labeled "serious" software package developers include the independent software companies and the computer hardware firms which focus on software.

The computer hardware manufacturers have demonstrated their "expertise" in the software area over the last 15 years. In fact, until the last several years, they have virtually monopolized the marketplace with their "free" software. But history and experience have shown that these manufacturers have a habit of producing slow, inefficient, bug-prone and long overdue software.

The independent software companies, on the other hand, have established an enviable record over the last several years. Their products are innovative, well-supported and well-documented.

Since the independents are in the software business for profit, they are well aware that their products must be superior to those of their competition. This competitiveness, which is only possible in an unbundled software environment, results in numerous benefits for the computer user, as well as for the independent software product companies.

Those who are unconvinced of the superior quality of the independent software companies' products compared with computer manufacturers' software should survey any number of current users of software products purchased from independent software companies. Their personal experiences will undoubtedly make a strong case in favor of such software.

This is especially true since a good percentage of the products still on the market today have survived the economic trial by fire of the early 70s, when many of the fly-by-night software houses were folding in rapid succession. Additionally, the last several *Datapro/Datamation* software product surveys show there is a significant difference between the users' evaluations of the products developed by the independents vs. the hardware manufacturers. For the last five years, the independents have been rated significantly higher than hardware manufacturers in every category surveyed.

It is also a matter of record that software companies are attracting the most talented personnel and are completely dedicated to satisfying their users' needs, to staying ahead of their competition and to growing and prospering despite all obstacles. It's simply the free enterprise system at work — nothing more, nothing less.

A Growing Industry

It may seem presumptuous to discuss software products as an industry. After, all, according to Dun and Bradstreet, there are only about 30 major industries in existence. Even computer manufacturing is listed as part of the office machines industry.

Nevertheless, it is apparent that the impact of software products will eventually surpass that of computer hardware. Software product sales are expected to total as much as $4 billion by 1985. In fact, software products will act as the catalyst in achieving the full potential envisioned for computer hardware usage many years ago.

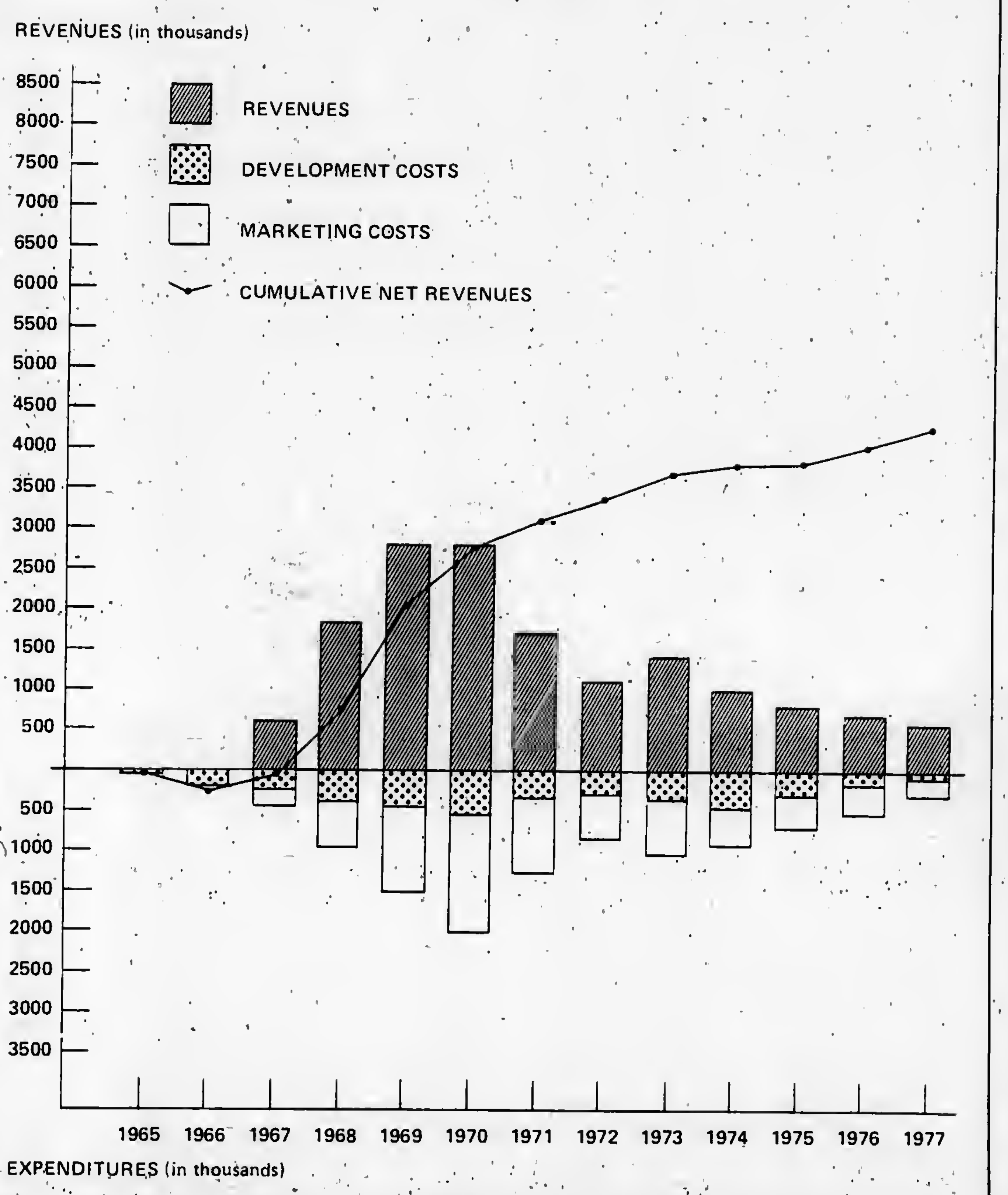
Today, the marketing of software products is one of the fastest growing segments of the U.S. economy — and the surface has only been scratched. The estimated annual growth rate is approximately 27%, despite the fact that almost all computer companies still practice some form of bundling.

My own forecast for the potential growth rate is even more optimistic, as long as the following favorable events occur:

- IBM does not deliberately develop its new Series E and H hardware and operating systems to preclude existing and proposed software packages from operating in those environments.
- Applications software package

(Continued on In Depth/14)

FIGURE 2. PROFIT AND LOSS HISTORY
Software Product No. 1



(Continued from In Depth/13)

technology will steadily improve so that future applications packages will be readily adaptable to individual customer requirements.

- More hardware manufacturers will completely unbundle.

The Technology Gap

There exists today a credibility gap in the potential effectiveness of computer usage. Why this gap was created is not important, although I've always been quick to blame it on the computer manufacturers.

In any event, it's there and it's real . . . so real, in fact, that many companies are still in the Dark Ages when it comes to the effective use of computers.

Today's DP problems are not simply the prolonged time and resulting high costs involved in program development. There are other grave problems that can play havoc with a user's computer utilization. Some of the problem areas include:

- The quality of existing computer applications, which is shamefully shoddy.
- The unreliability and unpredictability of computer applications in production.
- Maintenance and enhancements performed in an undisciplined environment where there is inaccurate or inadequate supporting documentation.
- Little management control during most stages of an application's life cycle.
- Typically, a great deal of duplicated effort in applications development.

The last point is perhaps one of the major keys to the effective use of computers. Although there are hundreds of thousands of programmers available today, there are only hundreds or thousands of creative, talented senior personnel capable of building quality applications.

Quality software cannot be economically and practically developed when companies are continuously trying to reinvent the wheel. Through the use of software packages, available human talent can be amplified.

A data base management system, a telecommunications monitor or a well-designed complex application are often beyond the resources of an average user installation. The purchase of quality applications packages can permit such an installation to automate more quickly and to dedicate its personnel to unique needs rather than to functions fulfilled by available software packages.

Even if a user does develop his own custom applications, systems software packages (e.g., programming and testing aids), can dramatically increase the productivity and reliability of such custom applications.

Most importantly, a user can now purchase a needed system which has already been proven in operation at many installations. As a result, the user can get on the air quicker, at lower cost and hopefully with fewer operational problems.

In many cases, these advantages are only possible through applications and systems software packages. These packages therefore are beginning to help to close the software technology gap that currently exists.

New Type of Application Packages

Because of today's recognition of applications packages' value, these packages should experience rapid advancement in the years to come which, in turn, will result in significant changes in the associated technology. In particular, I am convinced that a new type of applications software package will emerge.

The wave of the future will be "skeleton" applications that can be enhanced or customized by the user to meet his specific requirements. Although this concept is not by any means revolutionary, the way in which it will be accomplished may be.

Today, most applications packages are delivered with the source code for modification by the user to meet specific requirements. This approach creates two problems:

1. The user must initially be educated in the structure of the package.
2. Subsequently, he becomes responsible for its maintenance.

The approach of the future will be to design a package with inherent flexibility to accommodate "user-added" logic at strategic points. This is not as simplistic a trend as it may first seem. Current software technology does not

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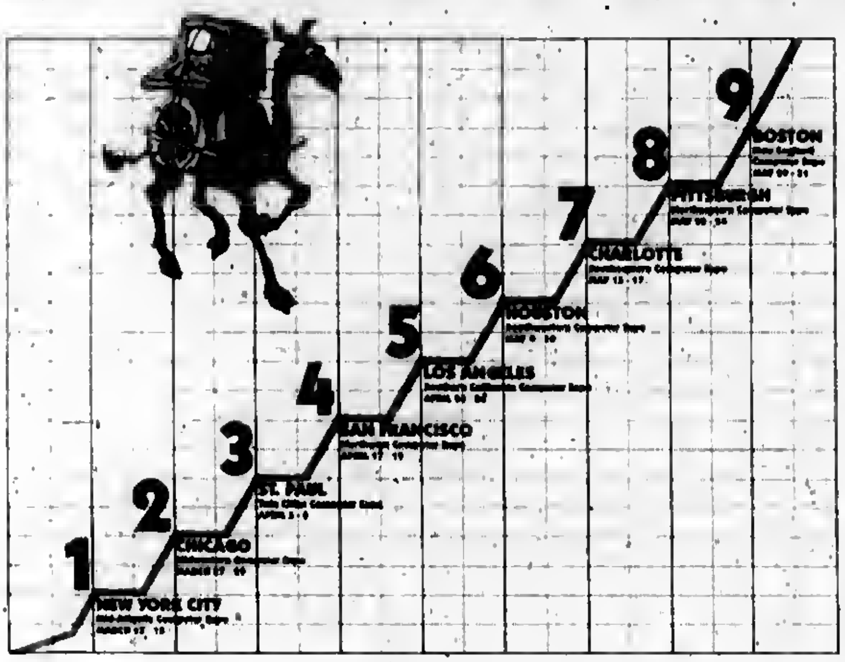

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provide adequate facilities for precompilation and other prerequisites for developing a modular system technique.

However, when these systems do appear, the use of applications packages will expand to match the growth currently being experienced in the area of systems software packages.

Systems Software

The future of systems software is a subject that I and my company think about constantly — both the short-term and the long-term. Since I've introduced the term "systems software," it is important for me to define my concept of it.

The systems software to which I'm referring is for IBM 360 and 370 mainframes (with which I'm most familiar) and includes all generalized software that is not directed toward a specific user application or industry.

Systems software, therefore, includes:

- All components of operating systems including job, file and storage management; security; time-sharing; utilities; and spoolers.
- Language translators — i.e., compilers and assemblers.
- Data base management systems.
- Sorts.
- Communication monitors.
- Performance measurement tools.
- Report generators.
- Programming aids — librarians, utilities, test data generators, automated documentation systems..
- File management and generalized retrieval systems.
- Computer accounting and tape management systems.

Systems software thus encompasses a very large class of programs. To address the question of the future of systems software as a whole, each of the component elements must be considered. And, before we can reach any conclusions, we must first try to answer the following questions (some of which we have already touched on):

1. What is the *current* trend of *systems software*?
2. What is the relationship of hardware to software?
3. What will IBM's new generation of computers look like?
4. Will there even be a new generation?
5. Was the 370 a new generation?
6. Does the extended control storage of IBM's latest computers indicate that "software in firmware" is a growing trend?
7. Will all systems software eventually be separately priced?

After taking these questions into account, I believe that the future of systems software, as I defined it, is very bright and will continue to grow rapidly for many, many years. Let me explain why I feel so optimistic.

In the last 10 years, the number of *different types* of systems software has increased at least 20 times. Certainly, if we include the total number of systems software packages, the number has increased 50 times.

For example, there are about 10 data base management systems, five to six communications monitors, about five operating systems and approximately 20 file management systems. If we measure the growth in lines of code (by looking at operating systems), systems software is proliferating wildly. I think this trend will continue at the same rapid rate over the next 10 years.

The next question must be, will all systems software turn into hardware or firmware?

Today IBM is selectively putting software into firmware. For example, the 370/138 and 148 have highly repetitive portions of VM and VS1, and the 370/168 and 3330s have portions of MVS.

IBM may attempt to market software extensively in firmware in the future. I do not believe IBM will be successful — if indeed it tries on a grand scale. And, I believe that, in the future, most software will not be put into firmware.

Will there be a new generation of computers? Everyone is speculating on this question. My feelings are that there will be a slow evolution and that most of today's code and systems software will be usable for the next 10 years, particularly if it is upgraded and improved.

Further, I believe this code will be fully usable on any next generation of computers — if there is one.

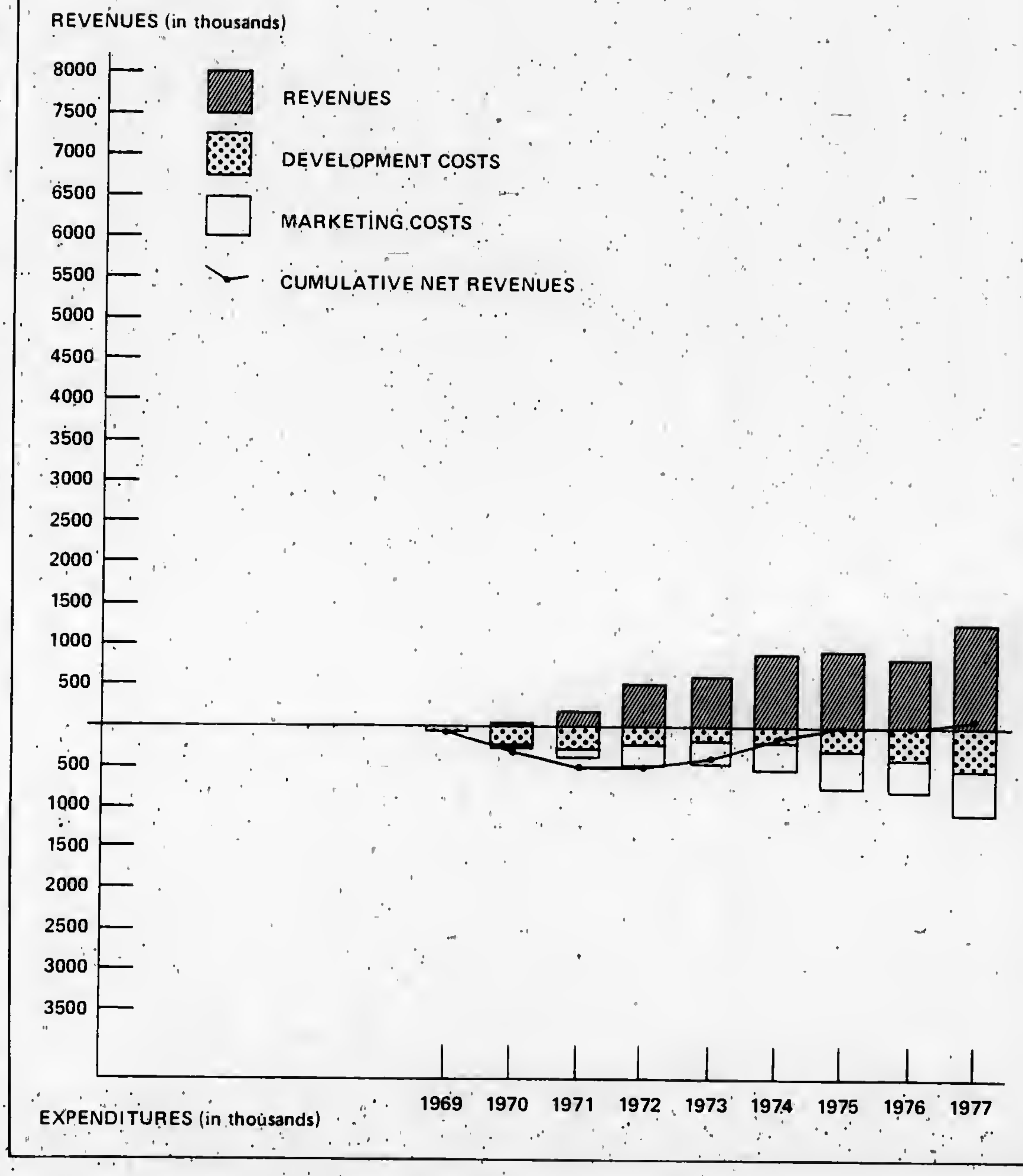
Will operating systems software be separately priced in the future? I think so. I believe it's only a matter of time and, depending on the pressures put on IBM, it can happen anytime from six months to five years from now.

I predict that in three to five years, all of IBM's operating systems will be separately priced. And this will open up a large market for independent software companies.

I'm bullish on systems software — all

(Continued on In Depth/16)

FIGURE 3. PROFIT AND LOSS HISTORY
Software Product No. 2



(Continued from In Depth/15)

of it. And I don't believe that IBM will get all of the pie.

The Marketing Business

The business of developing and marketing software products is just as complex as the business of selling computer hardware and, therefore requires considerable financial and human resources. There are several marketing considerations that clearly reflect the true nature of software products.

Foremost among these considerations are the need for an effective marketing and pricing strategy for a product, continued investment in a product even after its release and substantial technical support.

As mentioned earlier, a common misconception is the assumption that a software product can sell itself. A software company must be prepared to develop and support a thorough and effective marketing campaign to sell each of its packages to the public.

This campaign should involve advertising, sales brochures, extensive sales training, market analysis, performance specifications and user literature, among many factors. These marketing tools and their accompanying costs are a prerequisite for creating a viable software product. In fact, one reliable measure of the potential success of any software product is the resources that are allocated to its marketing.

It would be a serious mistake to expect that, once a product is operational and out in the marketplace, investment requirements end. The experiences of several successful software companies verify that extensive programming costs are likely to be incurred throughout the life of a product. Some of the reasons for these additional costs are:

- Enhancements/upgrading will probably be necesary to keep the product competitive.
- Changes will probably be required as a result of inherent design shortcomings.
- User requirements and environments (i.e., operating systems) frequently change.

Based on experience, as a general rule of thumb, a software "manufacturer" should expect to invest at least an additional 200% of initial development costs during a product's life. For example, if it is estimated that a package can be brought to market for $100,000, the anticipated total cost for that package should be approximately $300,000.

The graphs in figures 2, 3, 4 and 5 represent case histories of actual software products developed by Applied Data Research, Inc., founded in 1959 and one of the oldest software houses. These graphs illustrate the continuing financial commitment necessary to maintain any successful software package. The graphs show the potential profits, the various time lags between development and profits and the longevity of some successful products.

The success of a product can also depend on the technical support provided after the sale. Customers want, and demand service, and they are willing to pay for it. The guarantee of product maintenance, personnel training and installation support must be much more than an impressive sales claim.

Fulfilling this guarantee will ensure that the package will be used properly, that satisfied customers will continue to use the product and be available as references and that satisfied customers may become potential users of other packages from the same organization.

Cost-Effective Pricing

Once a company commits itself to a marketing and support program, pricing becomes the final element critical to the financial success of the product. Several sound pricing strategies have been developed and are dependent upon:

- The financial strength of the developer.
- The amount of competition and degree of competitive pricing.
- The value of the product to the user.
- The expected life of the product.
- The type of product.

The following list includes some specific pricing strategies that have been used in successfully selling proprietary software. The terms "lease" and "license" are used interchangeably, both implying restricted use by the buyer without ownership.

1. *Free trial.* No commitment is required on the part of the user.

EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer—the Burroughs B1700—with card input sequential files and no video displays, we suffered long delays and storage constraints.

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds—all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested—all by only two people—and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software.

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it: Thanks to the programming power of the VS, I actually came up with more.

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."

EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason

The VS is a remarkably sophisticated, fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment.

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We also think you'll appreciate how simple the VS is to operate. In fact, because of its level of sophistication, it can be operated by people with little or no computer-related training or experience.

One more thing: the entry level price of the VS is under $50,000. Which is perhaps the most remarkable thing of all about this computer.

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2. *Monthly payment.* This agreement to pay on a monthly basis can be canceled at any time (or on 30 days' notice).

3. *Three-month minimum followed by monthly payments.* This strategy is similar to Strategy No. 2, except that a three-month minimum lease is required. This was IBM's original standard policy for program products; however, it was eventually abandoned in favor of Strategy No. 2.

4. *Long-term lease.* From one to five years is the general standard for long-term leasing of many of the software products produced by independent software companies.

5. *Permanent license.* Under this agreement, the buyer can use a package indefinitely. Unfortunately, it is frequently too easy for a vendor to "hit and run" — that is, arrange for permanent use, but then fail to support the program. A user, therefore, must ensure that he will receive the source code if the vendor should refuse to maintain his package. Most companies offer separate maintenance contracts along with a permanent license.

6. *Monthly rental convertible to permanent license.* In effect, this is a combination of Strategies No. 2 and 5.

7. *Metered use.* This strategy is similar to a concept originally used by Xerox in the copier field. An internal meter is one of the factors that determines the cost of a package to an individual user. Although a relatively new concept, metered usage has been implemented on an experimental basis by several companies.

Obviously, there is a wide variety of pricing strategies. In today's economy, costs and pricing plans are particularly critical to a software package buyer. As a result, the alert software manufacturer should reappraise his pricing policies continually in light of changing economic and market trends.

Reasons for Growth

Both systems software and applications packages will see unequalled growth during the next 10 years. This growth will be oriented toward supplying software packages to users of unbundled hardware, i.e., IBM hardware.

Although DP managers are finally beginning to buy more software packages, less than 5% of the potential market has been tapped. This situation is rapidly improving for several reasons:

- The relatively healthy economy has enabled DP managers to again investigate programming developments in terms of cost and time savings. Applications and systems packages that can improve programmer productivity or reduce the time to get an application operational are now very much in demand.

In addition, there is a shortage of programmers, which makes commercial packages more attractive than time-consuming in-house development.

- IBM has paved the way toward making unbundled program products an acceptable method of doing business.
- The DP manager today is facing his greatest personal crisis. He is finally taking his appropriate place within the management ranks and, like every other manager, is finding that he must either shape up or ship out.

The "programming mystique" of the '50s and '60s has disappeared and, with it, the privileges of programming personnel. There is no longer tolerance for the "indispensable," undisciplined programmer or the short-sighted, disorganized DP manager.

Data processing has become just another department in most large organizations. As such, it must function in a disciplined, business-like manner.

Make vs. Buy Dilemma Over

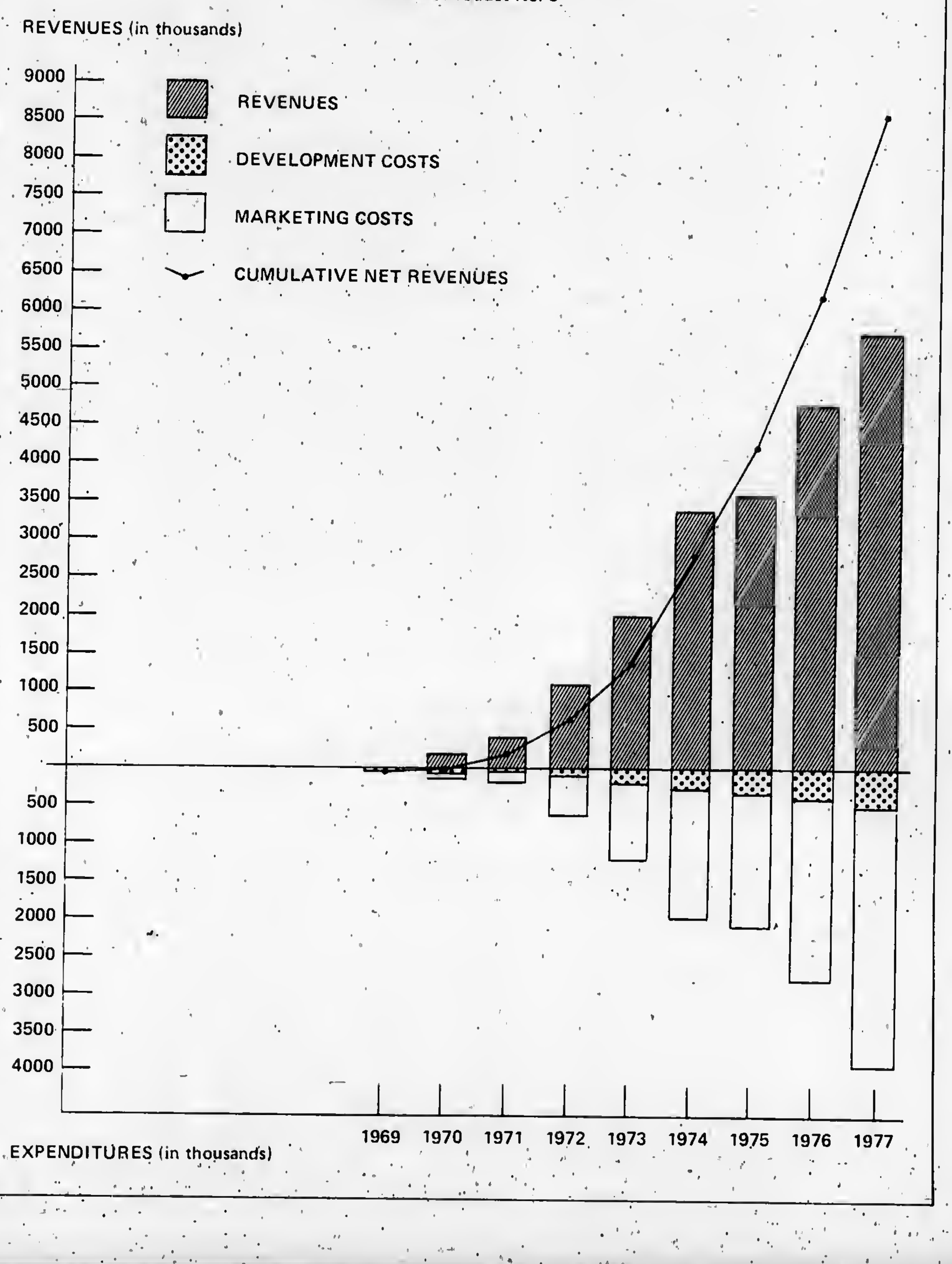
Historically, most successful software products cost $100,000 to $1 million or more to develop and maintain. These figures dictate the growth of the software products industry since the economics of the "make or buy" decision, therefore, are obvious.

For example, if a company can buy a product for less money than it would cost its DP center to develop in-house, there is only one decision to be made: buy outside. Seldom can a user internally develop a software product for less than its purchase price. The ratio of a package purchase price to the in-house development price is usually 1:10 and often is 1:100 or more.

Further, it is often highly unlikely that the user has available the necessary in-house technological expertise. Even if he can develop the product, the

(Continued on In Depth/19)

FIGURE 4: PROFIT AND LOSS HISTORY
Software Product No. 3



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(Continued from In Depth/17)

time and cost to document and maintain it are often prohibitive. Thus, the purchase price of a software product is invariably much less than the ultimate cost of internal software development.

And, even more important, buying commercial software assures the user of the latest technological advances and allows personnel to perform the more critical DP activities unique to the installation.

Tomorrow's Industry

Despite the favorable change in corporate attitude toward software and the blossoming marketplace, rough roads are still ahead for software companies. Investment money is still hard to come by, especially for investments such as those in software development where a return may take three years or more to materialize.

The potential and leverage are still there, however, as demonstrated by the significant number of software companies which are now beginning to reap large profits on their software product investments.

If computers are to be used more effectively and less expensively, users themselves must promote the growth of the independent software industry. Years ago, there were visions of simplified computer usage, extensive management information systems, inexpensive automation of much clerical paperwork, and low-cost program development. These goals can still be realized, but only through the development of improved applications and systems software packages.

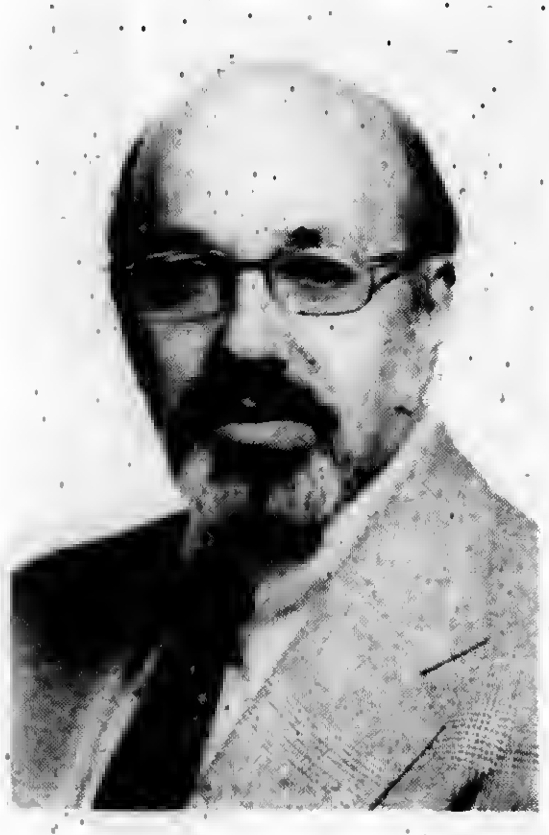
As the entire software industry grows, it is inevitable that certain products will become recognized as leaders; trade names, or brand names, will become synonymous with quality software. To date, IBM products have not succeeded in becoming the brand name for quality. In fact, several independent companies' products are close to becoming a DP household word, since these companies have primarily specialized in relatively restricted areas of expertise.

Furthermore, independents in general have shown themselves more responsive to user problems, to enhancing their product based on user requests, to producing efficient and easily used packages and to developing a variety of attractive pricing schedules.

Finally, the financial stability of the independents is improving daily to contribute further to their good reputation. In the long run, the DP community may well look first to the independent software companies to satisfy their software needs. In the extreme, it might just be possible that IBM will become Brand X in the software products market.

The future of the software industry appears to be very promising, with very significant growth only around the corner. For those firms willing and able to make the necessary financial and human resource commitments, the proverbial pot of gold is still waiting at the end of the software package rainbow.

Most importantly, the real benefactor will, at long last, be the user who, for the first time, will have the necessary tools to truly control his DP environment.

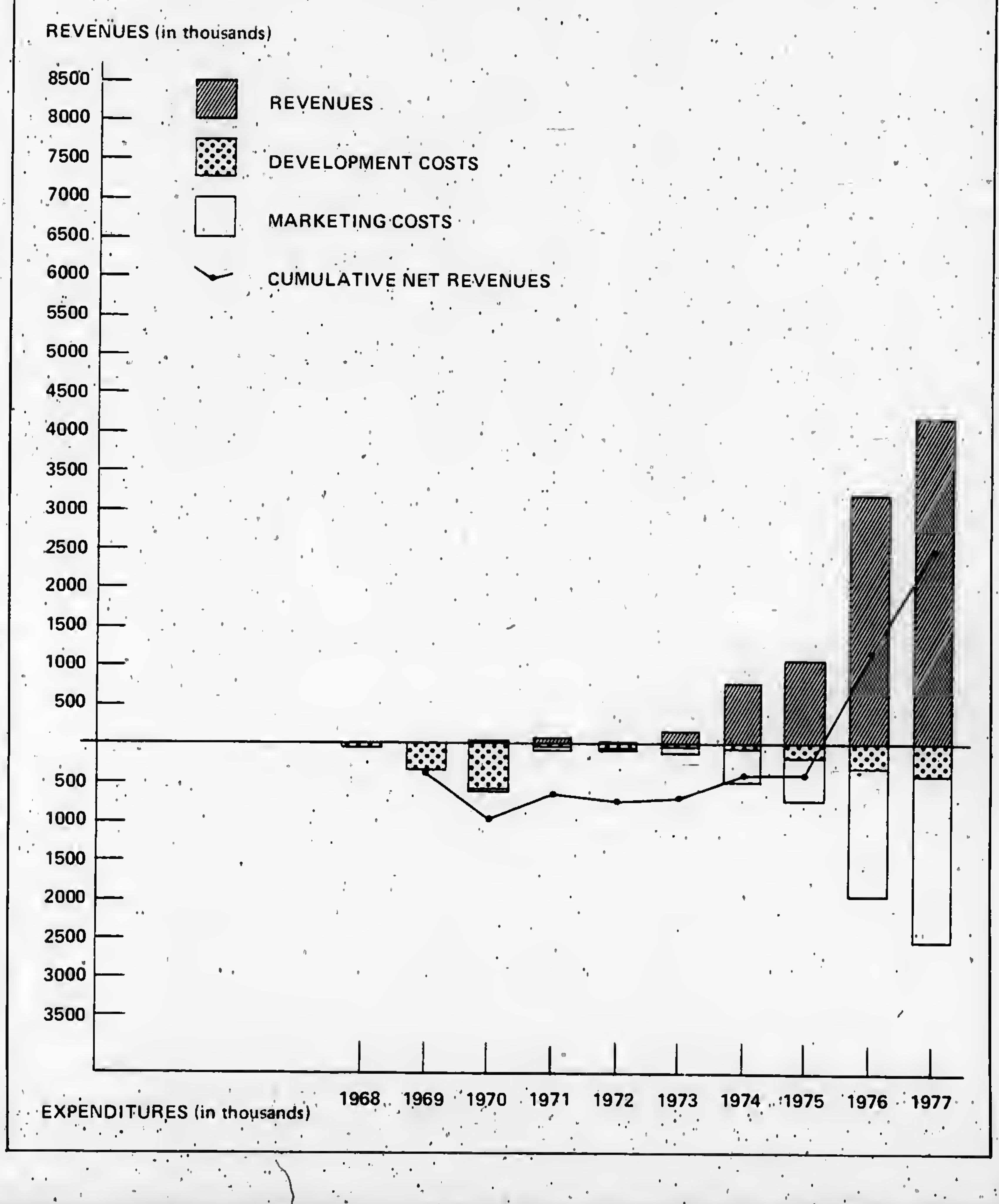


Martin A. Goetz is senior vice-president and director of the Software Products Division of Applied Data Research, Inc. (ADR). He holds the first U.S. software patent and is a co-author of High-Level Cobol Programming, *published in 1977.*

Goetz began his career as a programmer with Sperry Rand in 1954; in 1959, he co-founded ADR. In 1973 he served as president of the Association of Data Processing Service Organizations' Software Industry Association.

Goetz holds bachelor and master degrees from the City College of New York.

FIGURE 5. PROFIT AND LOSS HISTORY
Software Product No. 4



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Announces Price Hike

CA Reconfigures Low-End Syfa System

By Jeffry Beeler
CW Staff

IRVINE, Calif. — Computer Automation, Inc.'s Commercial Systems Division (CSD) has reconfigured the entry-level member of its Syfa network processing systems line and at the same time boosted the average price of most other Syfa hardware by 4.7%.

Designated the DSK-32, the repackaged CSD system replaces the DSK-10 at the bottom of the Syfa product line and differs from its predecessor only in disk capacity and price, according to a CA official. Whereas the DSK-10 incorporated 10M-byte disk units and cost $45,000, the DSK-32 supports up to eight 32M-byte disk systems and costs $2,500 less.

Under the CSD's recently announced general price restructuring, however, one of the larger Syfa configurations and most of the Syfa systems' hardware modules jumped in price by $500 to $3,000. The cost of a DSK-80 system with one 80M-byte disk unit, for example, has risen $2,500, from $56,000 to $58,500, while an additional 80M-byte unit has increased in price from $17,500 to $18,000.

At $71,000, the cost of a top-of-the-line DSK-300 system with one 300M-byte disk unit remains unchanged, and an additional 300M-byte system is still priced at $32,500. Other Syfa hardware pruducts whose price tags have not changed include the line's network processor, which costs $29,000 with a 64K-byte main memory, and its CRT terminal, which sells for $2,750.

Among the remaining Syfa system hardware modules, the 300 line/min line printer now costs $17,00, up $1,000 from $16,000, while the price of the family's 600 line/min line printer has jumped $1,250 from $19,500 to $20,750, the spokesman said.

A Syfa 800 bit/in. magnetic tape unit, previously priced at $8,275, now sells for $10,550, compared with $18,000 for the 1,600 bit/in. version, whose cost has risen $3,000 from $15,000.

CA also boosted by about 5% the fees for its optional maintenance contracts.

The CSD spokesman attributed the product price hikes to inflation and to the rising cost of labor and transportation.

Other DSK-32 Features

Elaborating on the DSK-32's features, the source credited the low-end addition to the Syfa systems line with accommodating up to eight Control Data Corp. Phoenix disk units, which reportedly hold 22M bytes of formatted storage. Like the other members of the Syfa system line, the DSK-32 incorporates a disk

(Continued on Page 70)

Interactive Mini System Improves Management of National Forest

GRESHAM, Ore. — Management of Mt. Hood National Forest's timber harvest, from designing logging systems to keeping track of paper manufacturer's bidding transactions, depends these days on an interactive minicomputer system connecting the forest's seven ranger districts to the supervisor's office here.

In the late 1960s, Mt. Hood, with an annual allowable timber harvest of 364 million board-feet a year, became one of the first forests to use programmable calculators for road design and timber appraisal work.

By the early 1970s, however, a more powerful computing capability was required. So Mt. Hood accessed an outside time-sharing facility interactively with teleprinters and a high-speed batch terminal from the regional office in Portland.

That solution, however, eventually became almost useless as demand for computer time increased among 19 other national forests that also used the regional batch terminal. The system was soon so overloaded that it could no longer meet Mt. Hood's needs.

In 1973, the Department of Agriculture established a centralized computer center in Fort Collins, Colo. Although the center offered both batch and interactive processing, Mt. Hood still could access the system only in batch mode from the regional office.

"We had great difficulty meeting our production and land use goals with that system," Frank Heaton, Mt. Hood's computer specialist, noted. "The Fort Collins computer was heavily overloaded and operating at peak utilization.

"The slow-speed terminals we used caused a bottleneck and there was tremendous competition for the one high-speed batch terminal and seven interactive telephone ports that served the region's 19 national forests," he added.

"We were spending about $50,000 a year in computer and telecommunications costs, which were rising steadily, and we still did not have a system responsive to users' needs," Heaton said. "At times, we spent several hours simply trying to make connections with Fort Collins."

Two-Year Evaluation

In 1974, Mt. Hood began a two-year project of research and evaluation of computing alternatives. Mt. Hood's most critical requirement was for a responsive, user-oriented system that would help it meet production goals and adapt to changing needs, according to Forest Supervisor Dale Robertson.

"Time is our most valuable resource," Robertson said. "We needed a system that would give our professionals more time to develop better ways of meeting production targets with mini-

(Continued on Page 74)

Programmable Multiplexer Links PDP-11 to 16 Lines

IRVINE, Calif. — Users can reportedly connect a Digital Equipment Corp. PDP-11 to as many as 16 asynchronous serial communications lines with a programmable multiplexer from Able Computer Technology, Inc.

DMAX/16 consists of two hex boards that link to a rack-mounted current-loop or RS-232 interface panel through separate flat-ribbon cables, according to an Able spokesman.

Capable of providing independent program control of all communications lines, the multiplexer accomodates 5-, 6-, 7- or 8-bit character lengths. For 6-, 7- or 8-bit characters, the unit provides one or two stop bits; for 5-bit characters, one or 1.5 bits.

The multiplexer also offers even, odd or no parity generation or detection and operates in either full- or half-duplex mode. Fifteen programmable transmission rates allow the DMAX/16 to operate at speeds from 0 to 9,600 bit/sec and at 19.2k bit/sec.

Using 16 double-buffered MOS/LSI receivers, the unit assembles incoming characters by converting them from serial to parallel.

Measuring 16 bits wide and 64 words deep, the silo incorporates a register addressable from the PDP-11 Unibus.

DMAX/16 costs $5,000 with up to 30% discounts available from Able at 1751 Langley Ave., Box 18162, Irvine, Calif. 92714.

HP Desktop System Has Assembly Coding

PALO ALTO, Calif. — Assembly language programming, expanded main memory and enhanced Basic have reportedly been combined in a mid-range addition to the Hewlett-Packard Co. line of desktop computer systems.

Depending on the application, the System 35's Assembly language capability provides two to 100 times greater performance than traditional desktop computer languages, according to an HP spokesman.

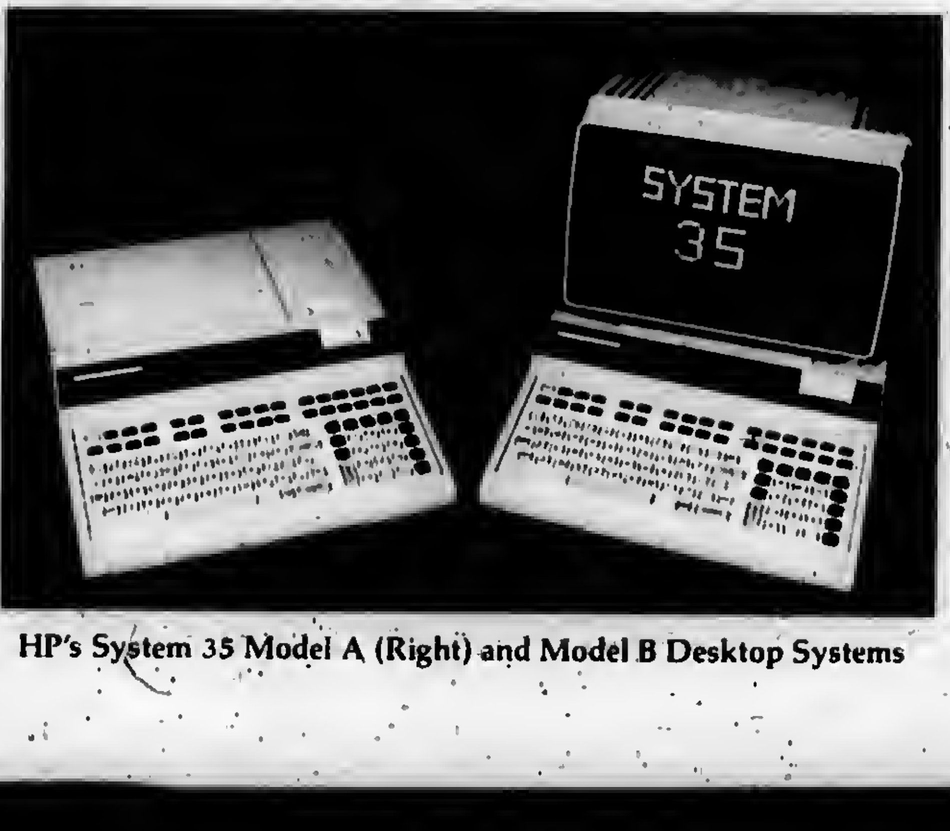
HP also credited the Assembly language feature with allowing programmers to talk to the desktop system's CPU in its own internal language. No other desktop system provides this capability.

Coupled with HP's line of standard interface cards, the Assembly language feature opens the System 35 to applications formerly reserved primarily for minicomputers. Typical tasks for the system include high-speed data acquisition and computation for scientific and engineering projects.

HP supplies its latest desktop system in two versions — Model A, which incorporates a 24-line CRT terminal, and Model B, which provides a single-line, 32-char. display.

Both versions store a minimum of 64 K bytes of read/write memory expandable in 64K-byte in-

(Continued on Page 70)



HP's System 35 Model A (Right) and Model B Desktop Systems

Adapter Lets Users Replace Burroughs Line Printers

SAN DIEGO — Burroughs Corp. minicomputer line printers can reportedly be replaced with competitive models, thanks to a modified version of the Datasystems Corp. Burroughs line printer adapter (BLPA).

Datasystems credited the BLPA with allowing users to replace the Burroughs A-9249 line printer systems with any printer compatible with Centronics Data Computer Corp. or Data Products, Inc. models.

Datasystems' enhancements to the BLPA are said to include the addition of all cabling to a controller and printer.

The BLPA also gives users of printers like the Printronix, Inc. P-300 a combined printing and plotting capability for a cost comparable to that of a Burroughs print-only system.

Equipped with an optional power supply for special applications, the unit is buffered for parallel data transfers between a Burroughs minicomputer and a line printer.

For a Centronics-compatible printer, the adapter costs $450; for a Data Products-compatible printer, $550. OEM and quantity discounts are also available from Datasystems at 8716 Production Ave., San Diego, Calif. 92121.

HP Desktop System Uses Assembly Language Code

(Continued from Page 69)

crements to 256K bytes, the largest main storage capacity available with an HP desktop system. The previous upper limit was offered by the System 35's sister product — the HP System 45, which accommodates up to 64K bytes, the source said.

When fully loaded with read/write memory, the System 35 can manage a 30,000-element array of 12-digit floating point numbers or solve 170 simultaneous equations with 170 unknowns, he added.

Both the A and B models also provide a minimum of 16K bytes of read-only memory (ROM) expandable to 128K bytes.

Although System 35 users can specify Assembly language as an option, the desktop system offers HP's enhanced Basic as a standard feature. Because it is also available with the System 45, HP Basic simplifies the transfer of data and programs between the two desktop systems models.

A common programming language also means the systems 35 and 45 share the same software library.

Fortran-Like Capabilities

Besides accommodating programs written in Ansi Basic, HP's enhanced Basic provides Fortran-like capabilities like subprograms, multicharacter identifiers, large-scale array operations, line labels and output formatting.

Measuring 14.8 in. high, 15.1 in. wide and 19.5 in. deep, the System 35A integrates an interactive keyboard, 1,920-char. CRT terminal and 217K-byte tape cartridge unit that searches at 90 in./sec and rewinds end-to-end in 19 sec.

Except for the CRT terminal, the System 35B incorporates the same configuration as the Model A but, because of the single-line display, measures only 5.1 in. high.

A basic 64K-byte System 35A costs $9,900; a basic 64K-byte System 35B, $8,700. Deliveries of both models will begin next January from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

CA Replaces Low-End Syfa

(Continued from Page 69)

controller that supports any disk system mix.

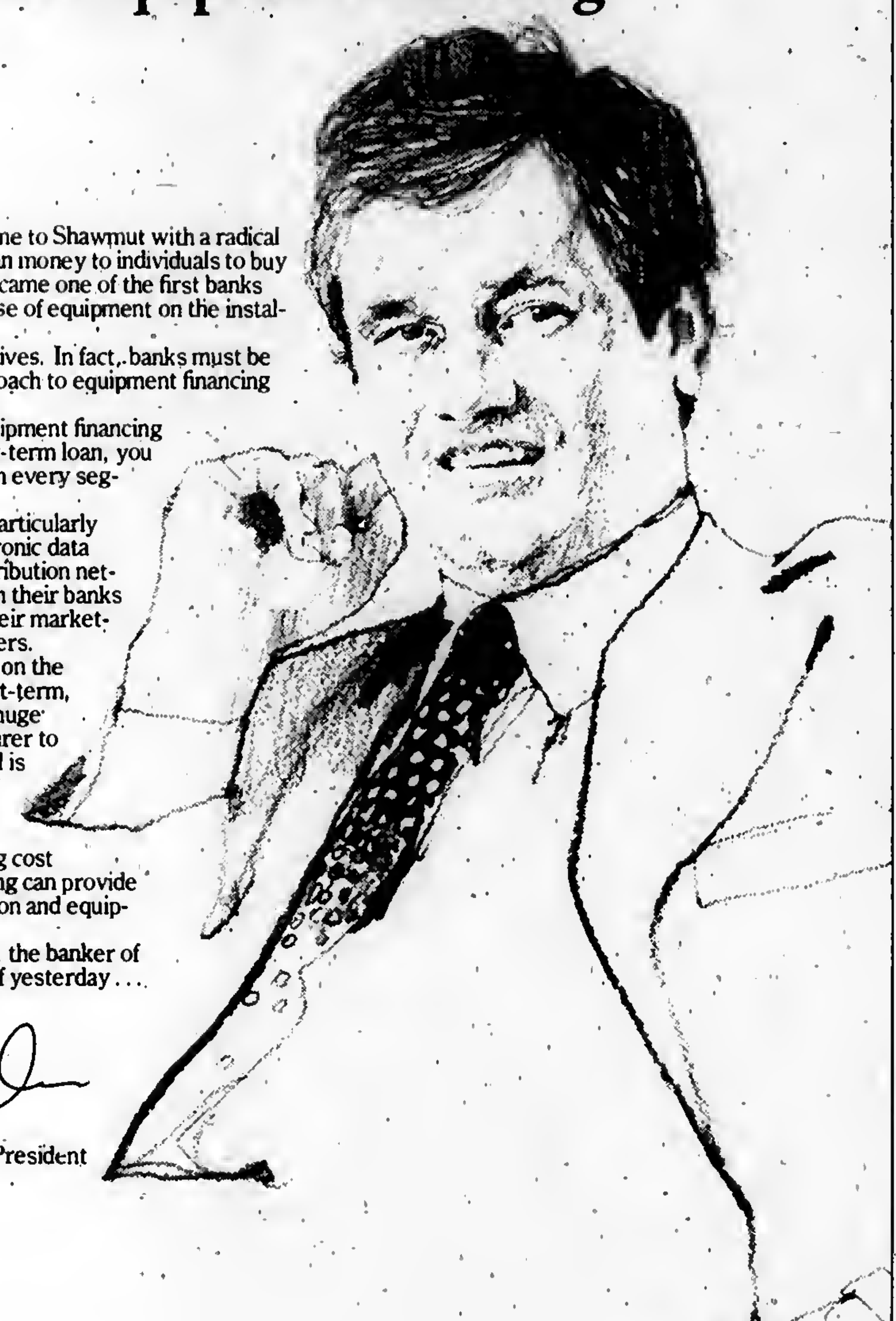
Before the introduction of this common controller, Syfa systems could mix only 80M- and 300M-byte disk units.

The DSK-32 will compete against systems like the Datapoint Corp. 5500 and 6600, Digital Equipment Corp. PDP-11/34 and IBM Series/1 and System/34, the spokesman said.

Typical users of the system will include companies that intend to build a communications network around at least two high-end 370s, he added.

Like the other members of the Syfa series, the entry-level system consists of a network processor expandable from 64K bytes to 304K bytes, up to 32 local or remote terminals, as many as four spooled line printers, a magnetic tape drive unit and two synchronous communications channels. Prices start at $42,500 from CA at 18651 Von Karman Ave., Irvine, Calif. 92713.

Brian Elsden on Equipment Financing:



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Forest Management Aided By Interactive System

(Continued from Page 69)

mum environmental impact.

"We also wanted a system that would let us make most professional land management decisions at the ranger level — the units closest to the forest — without further review by supervisory or regional offices," Robertson added.

The system ultimately chosen to fulfill Mt. Hood's computing needs incorporates a Prime Computer, Inc. Model 300 virtual memory CPU that accommodates up to 31 simultaneous user.

The system also consists of 192K bytes of main memory, a 40M-byte disk unit, one Prime 300 line/min printer and six CRT terminals from a various vendors.

In addition, it provides 10 teleprinters, a 200 card/min Prime card reader and one 9-track, 800 bit/in. tape unit.

The system currently performs more than 30 applications, including preliminary computations that must be made before timber can be harvested and sold. The collection of this data, which often takes up to five years, allows the forest service to determine the feasibility of a timber sale.

It also permits rangers to assess what impact the harvest will have on the environment, according to Robertson.

Forest Surveys

During a forest survey of nearly mature trees, specialists evaluate the harvest's impact, measure and calculate harvestable wood volume, determine harvesting methods and appraise timber worth. This data is later stored in the minicomputer system.

When timber is ready for harvesting, highly competitive bidding on timber sales takes place — often exceeding 200 bids per sale and requiring many calculations. Using remote terminals at the bid site, Mt. Hood can calculate and document the process — a capability it never had before, Robertson said.

Before removing timber, specialists must design sophisticated logging techniques including the use of helicopters, skyline cables and balloons.

"Before we had the minicomputer, we submittted our design calculations — numbering up to 100 different alternatives and combinations — to the regional office for processing and then waited one to three weeks for data," Robertson said. "Then if the logging design wasn't practical, we resubmitted data and waited another two to four weeks for an answer," he added.

The minicomputer system allows direct interaction and gives the specialists more time to fine tune their logging systems analysis and design, Robertson noted.

Kit Lets Users Clean Peripheral Components

TARZANA, Calif. — End users as well as DP technicians can reportedly clean magnetic peripheral guides, heads, capstans and other critical components with Innovative Computer Products, Inc.'s CK-25 cleaning kit.

Said to be effective in cleaning difficult-to-reach peripheral sections, the kit provides a dual-ended plastic cleaning wand with an applicator that offers a lint-free polyurethane mitten attached to each end.

The kit also provides a proprietary cleaning solution that major computer manufacturers have approved for cleaning magnetic disk surfaces, according to an Innovative Computer Products spokesman. The solution reportedly removes oils and contaminants from critical areas and leaves no residue.

In small quantities, each kit costs $15 and is available from Innovative Computer Products at 18360 Oxnard St., Tarzana, Calif. 91356.

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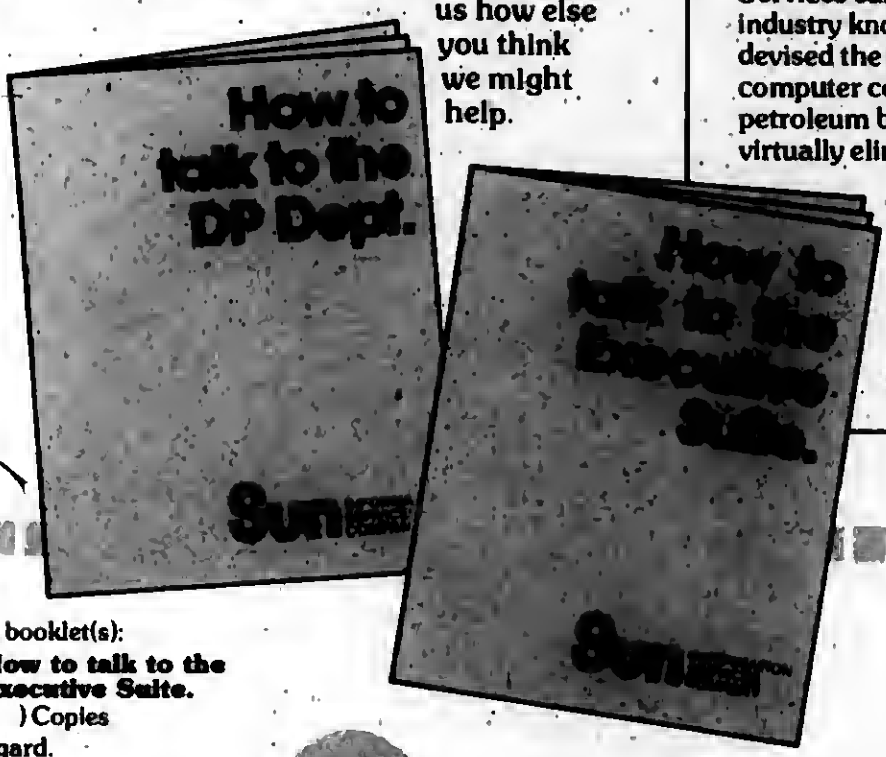
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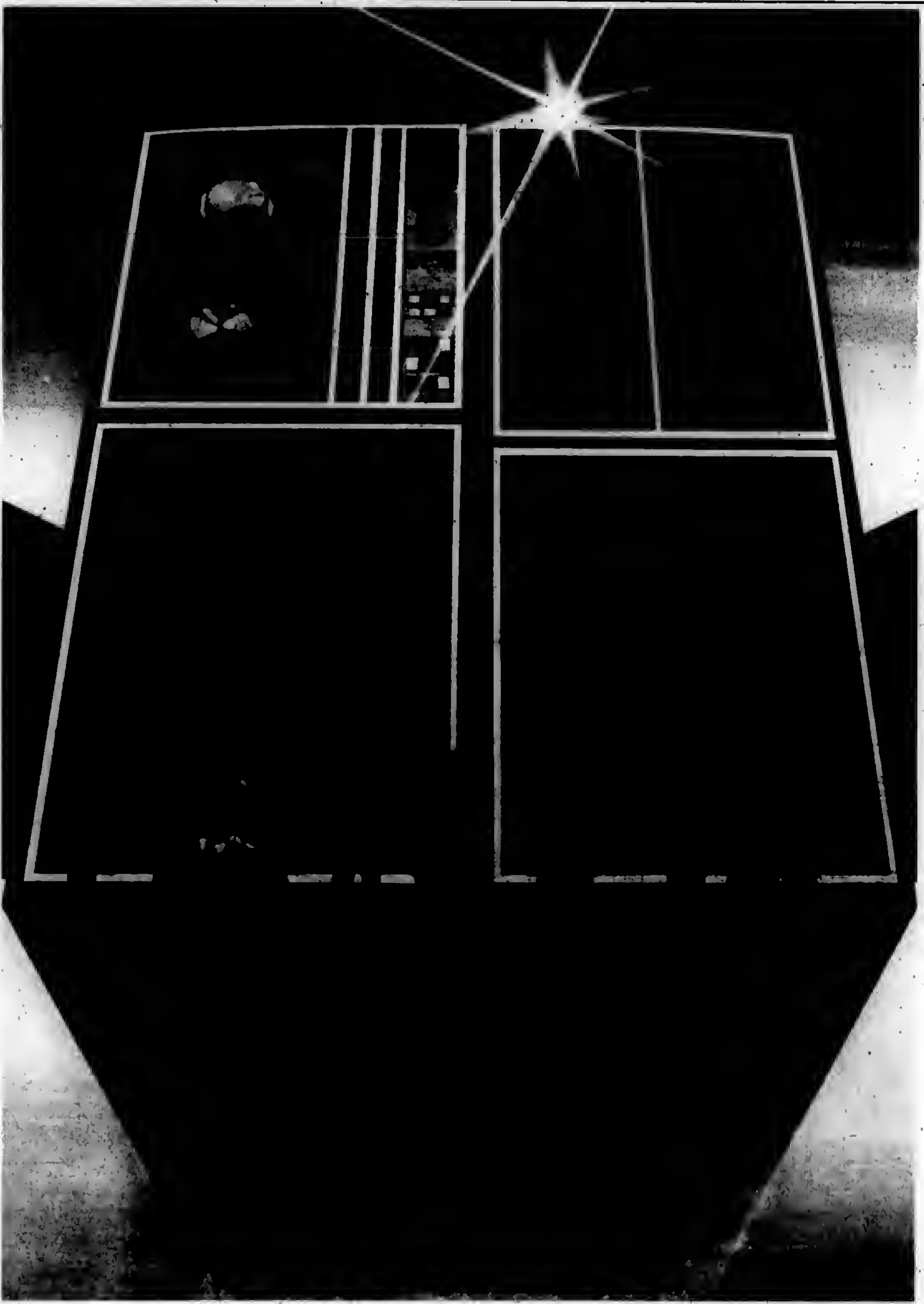
In-House Mini Helps Firm Boost Revenues

VAN NUYS, Calif. — In the last five years, a security services firm here has nearly quadrupled its annual revenues from $10 million to $37 million, and one of the company's chief officers attributes much of that growth to the organization's decision to replace its machine-driven accounting procedures with an in-house small business system.

Before it installed its current system, California Plant Protection, Inc. (CPP) produced its financial reports with the help of an NCR Corp. 3100 bookkeeping machine built around an integral minicomuter. But with that earlier system, CPP, whose 25 offices in six states provide uniformed security guards to more than 500 industrial firms, "couldn't get the statistical data we needed for cost control," according to Charles Colglazier, the company's vice-president of finance and administration.

Because of limitations in processing speed, the bookkeeping machine also often forced CPP to wait as long as 20 days to receive its financial reports. By the time the documents arrived they were usually outdated.

Faced with these problems, the firm switched from its NCR '3100 to a Basic/Four Corp. Model 600 minicomputer. "It was like going from a bicycle to a Cadillac," the administrative vice-president explained. Since the conversion to the in-house system, CPP has not only received more timely and detailed accounting data than before, but it has also been able to provide each of its 25 branches with financial reports that cover billing periods ending the previous Friday.



Precise Cost Centers

This feedback "has allowed us to set up precise cost centers within each operation," Colglazier noted. Every two weeks; the system also generates a separate profit/loss report for each of the company's clients.

Colglazier credited these reports with increasing CPP's awareness of the cost of servicing individual clients and with allowing managers to spot staffing weaknesses as well as erroneous bidding practices.

Since installing its minicomputer, the security services firm has traced many of its financial problems to guard turnover, overtime pay and insurance fees. With the system, managers can tell when costs in these areas start to exceed historical levels and can take immediate steps to prevent loss.

The computer also generates payroll checks, cost reports, a weekly open invoice register current to the previous Friday and period aging of accounts receivable. "We are able to monitor cash flow and alert branch managers to unusual account delinquencies by plotting accounts receivables against revenues," Colglazier explained.

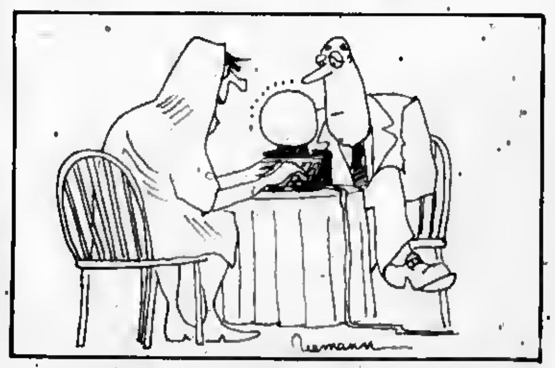
Reports received and distributed at CPP's corporate headquarters are said to give managers an overview of all operations as well as local responsibility. Moreover, the system allows the firm to distribute reports concerning its largest cost element — guard payroll. These reports compare the average hourly cost of a guard to the average hourly billing rates for a branch. They also list branch overhead costs in cent/hr and indirect branch personnel cost as a percentage of current revenues.

Besides a 24K-byte Model 600, the system incorporates two 10M-byte disk units, three CRT terminals and one 300 line/min printer.

When CPP bought the system in 1973, Basic/Four "was the only supplier of a complete system with the capability we needed at a price that we, as a small user, could afford. Other systems that were around at the time, like the IBM System/3, were too expensive and cumbersome," he recalled.

Colglazier expects to operate the current configuration for another two years before upgrading. "We estimate we will double our business in the next five years and at that time, we could set up another computer center at one of our Eastern locations using the existing computer program."

Within six months, CPP will install minicomputers at each of its branches to interface with the system here.



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Small System Expands Firm's Business Control

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ANAHEIM, Calif. — After installing its own small business an electronics firm has improved control of its business operation, simplified the problems of corporate growth and saved as much as $55,000/year in personnel and outside service costs.

Installed last December, the system has also improved Micronics International, Inc.'s profitability and productivity by reducing paperwork; clerical activities and associated costs. In addition, the system enhances management's planning and control, speeds company reactions to problems and facilitates report production with timely business information, according to Micronics vice-president Larry Resch.

"We now have a degree of awareness and control of our business that wasn't remotely possible with our former methods," Resch stressed. "And we have it on a daily basis. In addition, we have the means of not only coping with, but fully capitalizing on, our 15% to 30% annual growth rate."

Before installing its own computer system, Micronics, a $5 million/year manufacturer of electronic fusing devices for defense ordnance contracts, relied on an outside service bureau to manage its accounts payable, disbursements, labor distribution and payroll. All other activities were performed manually by Micronics personnel.

These combined efforts could neither keep pace with the company's workload, nor deal with its rapid growth. Detailed tracking of government contracts and reporting on other projects — some of which required 100 or more billing steps — demanded immediate, complete information.

These constraints drove Micronics to consider alternative DP business methods.

Used Management Consultant

To cope with these problems, Micronics sought the advice of a nearby management consulting and computer services firm, Stuart P. Orr and Associates in Los Angeles. Orr's subsequent study posed three choices: to further utilize a service bureau, to perform remote processing with the parent corporation's mainframe or to install an in-house interactive computer system.

Increased use of the service bureau was dismissed because it was too costly and would not provide the immediate, in-depth information Micronics needed.

Cost, again, was the factor that ruled out using the parent's mainframe. Remote-batch processing to the parent system could cost $3,800/mo to $6,700/mo. Just installing a batch computer at Micronics would cost from $3,000/mo to $4,000/mo.

Buying an in-house small business system appeared to be the most economical and efficient solution to Micronics' problem. For $2,000/mo the company would improve management planning and control and could cut personnel and outside service costs.

Micronics eventually installed a Data General Corp. Commercial System CS/40 with interactive ANSI-standard Cobol.

In addition to the 64K-byte CPU, the Micronics system incorporates two 10M-byte cartridge DG/disk subsystems, a magnetic tape unit, a 300 line/min line printer subsystem, four Dasher TP1 CRT terminals, communications chassis and multiplexer, an interactive commercial operating system and a Cobol compiler.

The four terminals — one each in purchasing, manufacturing, accounting and project control — work from one integrated data base. The system manages inventory control, shipping and receiving, tooling, purchasing, contract administration, quality assurance, production control, accounts receivable, payroll, labor distribution and general ledger.

Project Monitoring

Gathering information from all four departments, the system monitors each project's status, cost and schedule in addition to simplifying overall project management. In addition, job/cost budgeting and analysis improve evaluation of bids and project planning, Resch said.

The system also simulates the effect of changes on project costs and thus allows management to test the feasibility and economics of various changes before committing itself to a definite course of action.

Since installing the system, Micronics has also speeded writing and tracking of purchase orders, cut inventory investment costs and simplified the clerical chores and paperwork that results when the firm determines a reorder point and economic order quantity.

Among its other tasks, the system helps establish operations sequences and job priorities by due dates — a capability that controls costs and product quality, Resch said.

"With our new system," he added, "we now know where we stand in every phase of our business, at any given moment.

Three-Day Meet to Focus On Applications for Minis

NEW YORK — Minicomputer applications — current and potential — will provide the focus of a three-day conference slated to take place here Oct. 31-Nov. 2 at the Roosevelt Hotel.

To be presented by the American Institute of Industrial Engineers (AIIE), the conference is aimed at users and DP professionals and will explore topics like hardware and software trends and the role of minicomputers in small organizations.

The conference will coincide with two other AIIE-sponsored gatherings, also to be held in the Roosevelt Hotel. One of the concurrent conferences will cover distributed processing; the other, data communications.

AIIE charges a $355 registration fee for association members and a $395 fee for nonmembers. Requests for additional information should be directed to AIIE Seminars, Box 3727, Santa Monica, Calif. 90403.

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Micro-Based Line Printer Gives Clean, Uniform Type

PALO ALTO, Calif. — A 400 line/-min dot matrix printer from Hewlett-Packard Co. incorporates a microprocessor-controlled output mechanism that reportedly produces clean, uniform type by equalizing the impact of each print hammer.

Equipped with 16-channel vertical format control (VFC), the 2608A slews vertically at 14 in./sec and assigns each hammer to a permanent position to maintain dot alignment and vertical resolution, according to an HP spokesman. In its basic print mechanism, the 2608A assigns a hammer and drive coil to each of its 132 character positions. The hammers and coils in turn fit into a mechanically balanced print bar suspended on stainless steel fixtures.

Because of its integral microprocessor, the impact line printer also provides self-diagnostic capability that automatically verifies the unit's operational status. Users can reportedly initiate the self-start feature with a control switch or under program control.

If a failure occurs, the fault registers are said to identify the affected portion of the routine on a binary display.

As one of its standard features, the 2608A uses a 5 by 7 dot matrix to form a 128-character Ascii set, with optional Cyrillic, Katakana, APL and assorted European character sets available.

Under program control, however, users can double the printer's dot matrix size to 10 by 14, the spokesman said.

Up to 16 character sets can reside within the 2608A, which can combine any two sets in the same line.

Using its programmable VFC, the printer is said to accommodate forms up to six parts thick and 127 lines long.

An optional sound cover, meanwhile, limits the printer's noise emissions to 68 dba, and a snap-in cartridge ribbon twisted in the shape of a Moebius provides an average print life of 30 million characters, the spokesman added.

The 2608A and its sound cover cost $9,250 and $150, respectively, with OEM discounts available from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Turnkey for Contractors Monitors Labor, Materials

HORSHAM, Pa. — Intended for residential and commercial contractors, a turnkey minicomputer system from Complete Computer Systems, Inc. (CCS) is said to help guard against cost overruns and schedule slippages by monitoring labor and materials from suppliers and subcontractors.

Builder I automates job costing, payroll, accounts payable and general ledger for users with little or no computer experience, according to a CCS spokesman.

In addition to a 64K-byte processor, 10M-byte disk unit, 120 char./sec printer and 1,920-character CRT, a basic Builder I configuration includes the Create software package. Create reportedly allows managers to produce custom-written reports from step-by-step instructions displayed on the system's CRT screen.

Among its major functions, the system generates job reports that summarize labor, material and overhead charges and highlight variations from original cost projections.

Builder I also tracks materials costs by item, vendor and job and breaks down accounts payable information by vendor, vendor invoice number, item or voucher number, the spokesman said.

In monitoring labor and material costs, the system validates all data entries through CRT-displayed instructional forms.

A basic Builder I configuration costs $42,795 and is available from CCS at 159 Gibraltar Road, Horsham, Pa. 19044.

Bootstrap Included

Disk Units Replace DEC's

IRVINE, Calif. — A series of floppy diskette systems from the Remex Division of the Ex-Cell-O Corp. are said to replace their counterparts on the Digital Equipment Corp. PDP-11 and LSI-11 series computer systems.

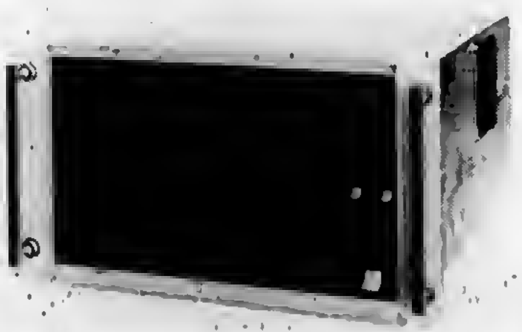
Plug compatible with their comparable DEC models, the Remex 11/11 and 11/12 connect to the PDP-11 Unibus and LSI-11 Q-bus, according to a Remex source. The units also provide built-in formatters, interfaces and diagnostics that make the products transparent to DEC's RT-11 operating system.

In addition, the 11/11 and 11/12 reportedly offer a read-only memory (ROM) bootstrap as standard equipment.

Other features include individual write-protect switches with each drive, busy and error status indicators and automatic reinitializing, the spokesman said.

The systems provide a utility module named Translate-11, which reportedly permits the exchange of data between an IBM 3740 and any unit supported by the Remex RT-11 operating system.

Prices of the plug-compatible floppy disk system start at $3,195. Remex can be reached at Box C-19533, 1733 Alton St., Irvine, Calif. 92713.



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To Manage Future Growth

Mini Speeds Energy Product Firm's Processing

By Marguerite Zientara
CW Staff

TULSA, Okla. — Reacting to a need for on-line, multiprogramming capabilities, an energy equipment manufacturer switched from an IBM System/3 Model 12 minicomputer to a Hewlett-Packard Co. 3000 to help the company manage future growth, reduce order processing time and ensure greater inventory control.

Hinderliter Energy Equipment Corp., founded 27 years ago, has four basic businesses — well-head equipment fabrication, crane blocks production, forged sheave manufacture and metal heat treating.

By last fall, the company was using the System/3 more than 400 hour/mo. "We just didn't have enough time to run everything," remarked Dave Thompson, the firm's programming supervisor. As a result, the firm decided to scrap the IBM equipment and began to "seriously consider" the HP 3000, an IBM System/3 Model 15 and an IBM System/34 as replacements.

At the time, the System/34 lacked the expandability to meet Hinderliter's growing needs, according to Thompson, and the System/3 did not have an on-line, multiprogramming capability. "The System/3 is set up basically in partitions; you can have one job running in each of usually three partitions and the Customer Information Control System takes up one partition itself," he explained.

Search for New Gear

"My boss had five or six years of computing experience on HP equipment, so he knew what it offered," Thompson noted. "About the time we started looking for new equipment — last October — HP opened a sales and service office in Tulsa.

"Probably if it hadn't opened a service office we might have considered something else because we need the service and it provides excellent service here," he added.

Other capabilities that attracted Hinderliter to the HP system were its decentralized processing, its capacity to link to additional computers, its remote telephone access and its ability to link up to 64 on-line terminals.

The HP hardware was installed last December and conversion began early last February. By the first of April, the System/3 was out and the conversion of 700 programs and the operating system was complete.

Conversion Aids

"We figure that by using HP's utilities and other conversion aids we saved two to three months, at least, in conversion time," Thompson said. For example, HP systems engineers wrote a program that converted the IBM RPG-II to HP RPG-II and recompiled all the programs.

Hinderliter was able to recompile all 700 of its programs in about six hours, Thompson pointed out.

Another conversion aid written by an HP system engineer was a sort function "that configures almost exactly to the IBM sort," according to Thompson. "In fact, you can take the specifications and read them in as a file, and it will sort just like the System/3 would."

The System/3 incorporated disk drives, but all input was on cards, Thompson said. All input now relies on CRT terminals.

"With the HP system, we can have many users all on the system — at the same time — doing different things or even accessing the same file," he explained.

'No Waiting Time'

"There's no waiting time as in batch mode," Thompson said. "All the programmers have their own terminals on which they can key their own programs, compile and test them and actually put them into operation — all on-line and simultaneously."

The HP 3000 Series II Model 6 incorporates a 512K-byte memory, four 50M-byte disk units and a 600-line/-min printer. It also has 10 HP 2645 terminals, three HP 2631 printing terminals and two HP 2635 terminals.

"Although our costs for the HP system are approximately the same, we estimate a six- to 10-fold increase in throughput over the previous card-oriented system," according to Michael A. Lasley, Hinderliter's management information systems (MIS) manager.

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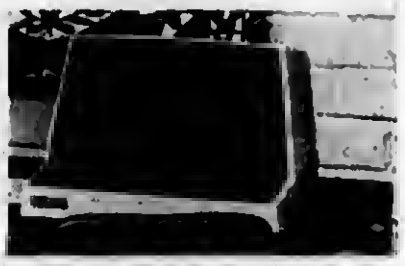

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Bevy of Changes Seen for Micro Users

• Isaacson Cites Software Snags

Osborne

McKeever

CW Photos by A. Dooley
Isaacson

By Ann Dooley
CW Staff

DALLAS — The major stumbling block the microcomputer industry must overcome is lack of software, and particularly high-quality software, according to Dr. Portia Isaacson, lecturer and owner of the Computer Store.

The answer to the problem, Isaacson told attendees at the International Microcomputer Exposition here recently, may lie in the emergence of software systems houses, similar to those that sprang up to serve the minicomputer industry in its infancy. These software companies would handle software from the programming to packaging stages, she said.

The micro manufacturers have put their hardware into reasonable shape and even system software appears to be adequate. It is the applications software that is holding back both the home and business user from enjoying the potential benefits of microcomputers, Isaacson stated.

The limited number of applications currently being offered to small businessmen are either the typical standard business applications or those applications relevant to only one specific business, she said. There are also a number of different variations for the same application, such as general ledger, and all are being offered at prices anywhere from $35 to $900, she noted.

Programs for home use usually range from $5 to $25 and are mostly very basic applications, incompatible with different kinds of micro equipment, Isaacson said.

The micro industry has only just begun to realize the amount of software necessary to fulfill the promise of the small computer, according to Isaacson, who added that a much larger choice of programs for home and business will be needed.

But the question to be resolved by the industry is where this low-cost software will come from, Isaacson told the attendees.

The solution to this dilemma will probably

(Continued on Page 84)

• Programmers On Way Out?

By Ann Dooley
CW Staff

DALLAS — Within the next five years, the computer industry will begin to see the demise of the programmer — that high priest who understands the machine but not the application, Adam Osborne, writer and president of Osborne & Associates, told attendees at the International Microcomputer Exposition here recently.

In a quarter of a century, the programmer function will no longer exist except in research and in analog-to-digital conversion, he told attendees. Computer technology will eliminate the need for the programmer, according to Osborne.

A self-programming computer such as Adam from Logical Machine Corp. is already performing problem-solving and can program by example, he said. When computers become sufficiently developed, the user who understands the application together with the computer will program cost-effective software, he said.

Inauspicious Beginnings

Turning his attention to the manufacturers, Osborne stated that "most microcomputer manufacturers are in the industry because they didn't have the sense to stay out," and added that many companies got into the market without really realizing what they were doing.

Many companies "backed into the industry," according to Osborne. A company would advertise a product, cash the checks that were sent in and then build the product. But in spite of these inauspicious beginnings, the industry is providing a worthwhile service because there is a need for these products, he said.

But now, for the most part, the industry has left its shady past behind and is entering a period of consolidation, according to Osborne. Those who are honest will stay in and those who are dishonest will lose out, he predicted.

In addition, many companies will soon get into big financial trouble because they won't know how to manage growth. The engineers who started the companies are now presidents who are not equipped to handle the problems of large companies, he said.

Osborne cautioned the audience not to

(Continued on Page 84)

• Shakeup Imminent: Osborne

By Ann Dooley
CW Staff

DALLAS — What goes up must come down and since the microcomputer industry exploded onto the scene, the fallout should be settling soon, Jeffery McKeever told an audience of micro attendees gathered at the International Microcomputer Exposition here recently.

While Adam Osborne addressed the long-range changes in the industry, McKeever, co-owner of the Phoenix Group, a wholesale/retail organization, talked about the present and what he sees coming in 1979.

McKeever's first short-term prediction was a shake-up in the industry. The micro industry has grown up in a period of rapid economic expansion, but how many consumers are cutting back against inflation and this means lots of things could begin happening, he added.

The small retail computer stores, so much a part of the micro scene, will be facing increased competition as Digital Computer Corp. and other manufacturers enter the retail market with their own stores. In the industry's infancy, the users were enthusiastic hobbyists who were willing to wait for equipment or try new products. But the business user is not as willing to compromise and not as willing to hunt for parts or to make his own repairs, he noted.

Because of consumer cutbacks, computer stores will probably not offer as many different product lines as previously or otherwise they may be faced with seeing last

(Continued on Page 84)

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Despite Low Attendance

Show Crowd Changing, But Attendees Buying

By Ann Dooley
CW Staff

DALLAS — Planners of the International Microcomputer Exposition here went out of their way to welcome both hobbyist and small businessmen only to have neither group make much of an appearance.

The anticipated 20,000 attendees never reached the floor of the Dallas Convention Center, and although no official estimate has been announced, attendance probably never climbed to 7,000, according to observers.

Exhibitors were clearly disappointed and could be heard complaining about the small turnout. "Neither the hobbyists nor the small business people bothered to show up; only the vendors came," one exhibitor commented.

Although almost all of the exhibitors were disappointed with the attendance, several said their sales were still doing well. "A lot of the people aren't just browsing, they're ready to buy," one vendor noted.

The most striking feature of the show was the crowd itself. Gone are the crazy t-shirts, the hordes of hobbyists wildly excited about the newest kit and much of the bells-and-whistles atmosphere of the show itself.

Although some elements of each still linger, the industry is clearly making way for the small businessman. Suitcoats have replaced the t-shirts, and the products displayed in the booths are being increasingly geared for the business market. The exhibitors readily admitted that business people outnumbered hobbyists at the show, but few vendors seemed to show signs of regret. "The small businessmen are the ones with the money," one vendor noted.

Although the display represented a broad mix of products to both the hobbyist and the businessman, small business systems were quite prevalent.

No new products were announced at the show, but exhibitors seemed to attract enough interest from the passerby with their existing lines.

One of the more interesting exhibits was by the Ford Motor Co., which displayed its new Electronic Engine Control EEC-II system geared to control spark and exhaust gas recirculation and air/fuel ratio.

The EEC-II utilizes a solid-state module incorporating a microprocessor supplied to Ford by Toshiba. Seven sensors are used to determine crankshaft position, throttle position, coolant temperature, manifold absolute pressure, barometric pressure and exhaust gas recirculation valve position.

Using this information, the module calculates spark advance, exhaust gas recirculation flow rate and fuel-flow trim requirements and then sends electrical signals to control the solid-state ignition module, the exhaust gas recirculation valve actuator and an electric stepper motor in the carburetor.

The device will be used in 1979 standard-sized Mercury Marquis and standard-sized Ford LTDs sold in California.

The attendees themselves seemed pleased with the show. One remarked on the good mix of products and added, "The exhibit floor is one of the largest I've been to." And with a smaller turnout, the salesmen were willing to spend more time in explanation and demonstrations, he observed.

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GENERAL ELECTRIC

'Faire' to Open In Los Angeles

LOS ANGELES — The Third West Coast Computer Faire will be held at the Los Angeles Convention Center Nov. 3-5.

A conference program for the microcomputer user is planned, and an exposition on computing power for the general public. Registration is $6 for all three days.

For more information, contact Computer Faire, Box 1579, Palo Alto, Calif. 94392.

Monitor Aids Real-Time Work With 8080, Z80

SAN DIEGO, Calif. — Oasis Systems has introduced Real-Time Monitor (RTM) program for 8080- or Z80-based microcomputers that can perform multiprocessing.

RTM uses the idea of "task-based processing" to simplify writing for real-time systems, the firm said. The RTM is designed to divide the time and resources of a microcomputer and distribute them among many separate and independent modules or tasks, according to the company. The RTM tasks can communicate, synchronize with each other and schedule time-dependent processes. The RTM can function with or without a real-time clock, the firm said.

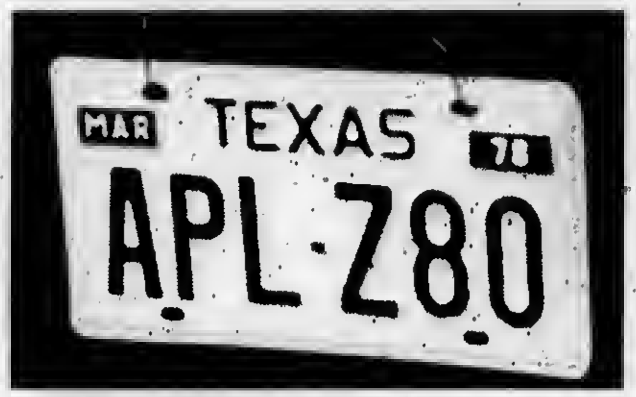
RTM is self-relocating and is read-only memory compatible. A package is available with documentation on CP/-M diskette for $75 from Oasis Systems, 2765 Reynard Way, San Diego, Calif. 92103.

Jose Villorreal and Romeo Vela ponder Radio Shack's TRS-80.

The crowds never made it to the micro exposition.

International Microcomputer Exposition

CW Photo Feature
by
Ann Dooley



Texans will license just about anything.

David Kiplinger and Matthew Williams, Dallas junior high students, try Noakes Data Communication, Inc. equipment out for size.

This Dallas duo doesn't intend to miss anything.

Richard Harsel waits his turn to use the Commodore Pet terminal.

The micro shows haven't become strictly business yet.

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Programmers' Demise Predicted

(Continued from Page 79)

look at the product first and foremost wl purchasing equipment but rather to examine the financial sheet of the company. At this stage, it is important to be sure the company selected will be in business in six months so the user won't be left unsupported.

Companies that make their products compatible with as many other products as possible will survive and those who continue to remain unique will be overlooked, he said. One of the major problems is the lack of any kind of compatibility among equipment and any company who tries to overcome that problem will be looked upon with favor by the buying public, he noted.

Speaking on the state of the industry, Osborne said that even though the S-100 bus is widely criticized, it has become the industry standard.

Another area of note is the increase in the number of de facto standards, he said. Such standards are not necessarily good, but they are adequate and usable — important considerations.

For example, he said, C-Basic and Microsoft Basic have become de facto software standards, yet Pascal is a better language.

But quality is not necessarily relevant, according to Osborne, who noted that what is important is the economics of the situation. It's important to stay with what is known instead of scrapping something already accomplished for something new and untried, he noted.

This also applies to software applications, he added. Very little that is new or innovative has been produced in micro software for some time. Currently, software consists of trivial programs, specialized custom software and the bread-and-butter business applications, he said.

Osborne predicted an increase in business packages because the businessman has little experience with, or knowledge of, software. These packages will be sold by computer stores, which will begin taking over more of this function, he said.

Industry Shake-Up Expected

(Continued from Page 79)

year's products on this year's shelf. Already stores are featuring 80% of their products in complete systems instead of the kits that were so prevalent in the past.

Hobbyists Satisfied

Before the micro explosion occurred, a demand for the hobby equipment had built up, but that demand is being satisfied now, and the hobbyist is not being seen in the stores as frequently as before. McKeever noted. Service has become the most important by word of the marketplace, and the attitude has gone from "fix it in a month" to "get it done today."

Users now want financing terms similar to large system contracts, and this creates a problem for the smaller computer companies who need all of their capital to operate. The market is moving from a noncapital market to a capital-intensive market, he noted.

McKeever predicted a sharp decline next year in home computer sales, since consumers are already spending next year's wages.

Although this will change in the distant future, McKeever noted that the small computers will be the first items to be cut from business budgets, too. Only professional users such as doctors or lawyers will continue to buy and use small computers, since they feel the economic pinch least of all, he said.

Software Snags Examined

(Continued from Page 79)

not come from the hardware manufacturers, she said, since they really only want to produce the equipment. Some of the manufacturers have provided software, but only enough to entice the user to buy their equipment. The major manufacturers may be willing to provide high-volume applications, but not the more specialized ones, she added.

Neither should users look to their computer stores for the answer, she said. Computer stores may add to the software market and already have done so to some extent. The stores are also the part of the industry most in touch with customers' needs. The stores themselves need software in order to sell hardware, she said. But stores are faced with the problem of being regional outlets as well as having to deal with many kinds of support problems, she said.

Several publishers of magazines such as *Byte* or *Interface Age* have experimented with recordings of software and one publisher even gives away the software to sell his books. But while these magazines are willing to distribute the programming, none have actively solicited new applications, she said.

It is also unlikely that users themselves, especially businessmen, would want to learn programming. They would rather buy a package with modified applications for their business. Isaacson told the attendees, however, that in the future, everyone will be able to program much the same as everyone can write today, but languages will be very different from those currently in use.

Although it is still unclear who will accept the responsibility for providing adequate software, certain problems must be overcome first.

For one thing, software distribution is still limited, she pointed out.

Second, because there is no one major hardware product, there is no standard for software and the user is therefore faced with attempting to run programs from people who had used different machines.

The answer to all the problems may very well rest with the software houses, who would manage the entire process, she said.

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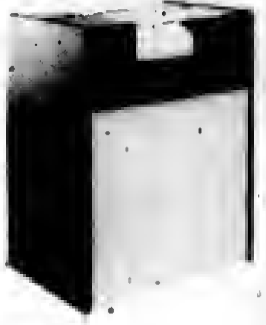

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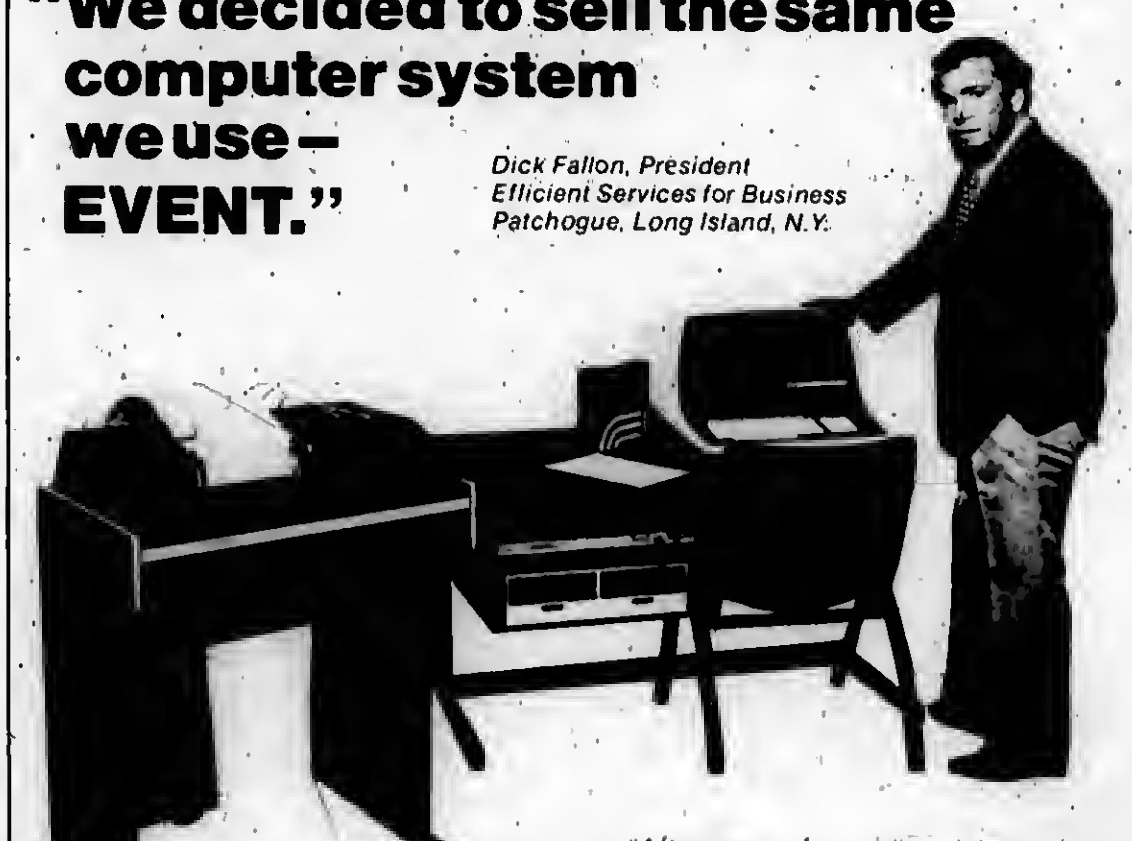

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IBM 8100 Characterized as 'Aggressive'

By E. Drake Lundell Jr.
CW Staff

"Aggressive."

"Very aggressive."

"Certainly aggressive."

"More aggressive than we expected."

That's how most industry observers painted the announcement of the IBM 8100 system [CW, Oct. 16].

Both IBM watchers and potential competitors of the system saw IBM's entry into the distributed processing marketplace as a bold move on the part of the industry leader. While the announcement of the 8100 as a replacement for the 3970 systems was fully expected, most in the industry were stunned at the breadth and scope of the announcement, particularly in the areas of memory technology and pricing.

The 8100 — known internally at IBM as the Orbit system — "is the most important single announcement in recent IBM history," according to Aharon Orlansky, analyst with Oppenheimer and Co., Inc. It is important not only because it marks IBM's full-fledged entry into the distributed marketplace, he said, but also because it clearly shows that IBM's business will be shifting away from hardware to rely more on software and services.

"The barriers to entry in the CPU business are very low" since circuitry can today be purchased relatively cheaply and complete computer systems can be assembled easily. "However, the investment needed to develop operating systems is extremely high," he added.

The complete unbundling of software with the 8100 showed IBM expected to make more money selling the software than the hardware, Orlansky said.

On the hardware side, Orlansky said, the unit is "far cheaper than anything else on the market with a similar capacity," and its hardware price is about half the cost industry watchers had expected from IBM.

The new 64K-bit memory chips show IBM is going to be very aggressive in the area of circuitry, he added, but warned IBM may be capacity-bound for the next few years in producing such devices.

At the same time, IBM is working on multilayer ceramic (MLC) logic circuits, he said, which should provide a major jump in the capacity of logic.

The announcement of the 8100 will have its largest impact on the mini

(Continued on Page 88)

FCC Questioning AT&T

Future Competitors Unclear On ACS

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Vendors who would have to compete with AT&T's proposed Advanced Communications Service (ACS) are not even sure what that service is.

That was the gist of comments and questions about ACS received by the Federal Communications Commission (FCC). The comments prompted the commission to request AT&T to answer about 150 questions on the ACS proposal.

Richard Pullen, an attorney with the domestic branch of the FCC's Common Carrier Bureau, said the general nature of AT&T's original filing and the many requests from vendors for further information on the service resulted in a letter from the commission to AT&T on Sept. 18.

The overall schedule for comments and replies by AT&T and all interested parties together with the FCC's Computer Inquiry already assure that the ACS proposal will not be acted on until at least next February, according to Pullen.

Moreover, AT&T has already notified the FCC that it may not be able to respond by the Oct. 18 deadline set in the commission's letter of Sept. 18.

DP manufacturers and industry associations are particularly concerned that ACS might include substantial DP services, he noted.

ACS, described by AT&T as "protocol-transparent," is a proposed packet-switched network designed to enable incompatible DP equipment and networks to communicate. The service would operate over Dataphone Digital Service (DDS) lines provided by the company's Bell System.

Several DP industry groups immediately raised objections to ACS [CW, July 24]. Comments filed last month with the FCC by the Computer and Business Equipment Manufacturer's Association (Cbema) and the CCIA, among others, expressed concern that DP services would be a large part of ACS.

AT&T is forbidden from offering DP serv-

(Continued on Page 92)

Semi Growth Predicted to Dip Next Year, But Will Recover

By Marcia Blumenthal
CW Staff

BOSTON — Semiconductor industry growth will dip sometime next year, but the stall will in no way resemble the recession experienced by semiconductor makers in 1974 and 1975, according to an industry analyst speaking here recently.

Various forecasts have placed industry growth at 22% this year, with a decline of 10% to 12% next year, but industry participants should not take a dim or short-sighted view of the future potential of the industry.

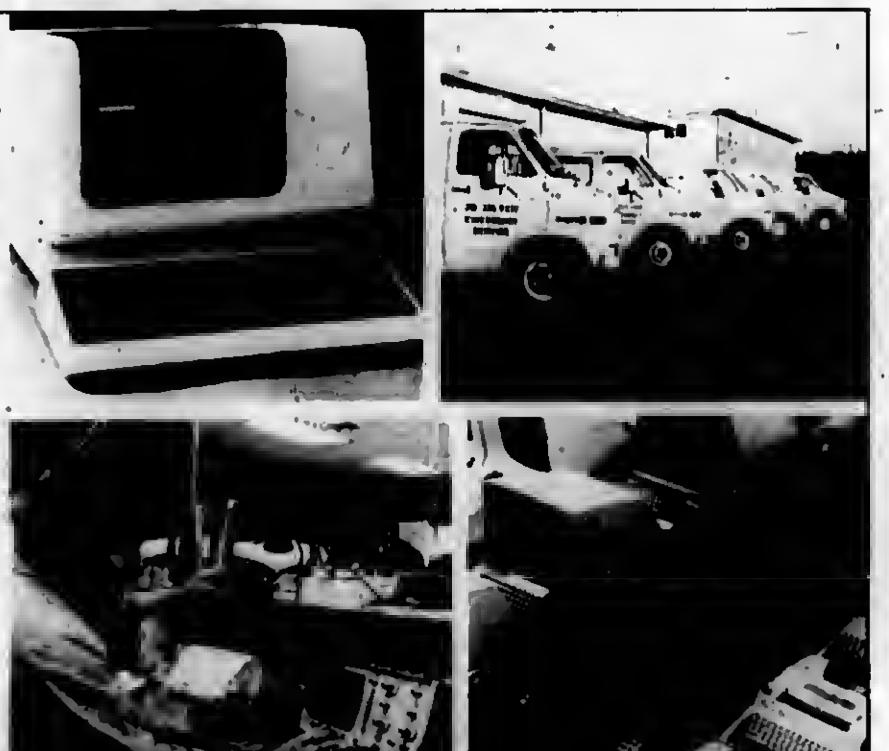
Benjamin M. Rosen, a leading electronics industry analyst and vice-president of Morgan Stanley and Co., Inc., thinks the semiconductor industry should grow 15% yearly until the end of the century, with annual revenues reaching $87 billion by that time.

These and other predictions were offered by Rosen in a lively presentation at the Semiconductor Equipment and Materials Institute's (Semi) first East Coast dinner meeting held here recently.

Semiconductor Industry Outlook

Concentrating on the semiconductor industry outlook rather than on growth prospects in the semiconductor equipment suppliers' sphere, Rosen, for the most part,

(Continued on Page 86)



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Pertec Division to Support Milacron's George Series

LOS ANGELES — Pertec Computer Corp. will provide maintenance and support for Cincinnati Milacron, Inc.'s "George" series of small business systems for the next five years, G.O. Harmon, vice-president and general manager of Pertec's service divisions, said.

Service for the approximately 600 installed systems will begin immediately. "Milacron's field service engineers will be invited to join Pertec's service force to provide effective, responsive maintenance and support for those systems," according to Harmon.

Milacron decided to discontinue actively marketing its George series last July [CW, July 17] and to support systems only to its existing distributors for the next two years.

Prior to that decision, Milacron intended to sell the line to CSD International Corp., a company to be composed primarily of former Milacron employees [CW, May 29]. Negotiations for the sale broke down when Milacron refused to extend the 41-day time limit for the sale's consummation.

After the announcement, distributors of the George line were bitter — many of them because they had invested in developing software for the system, others because they heard of the decision only one day before the news was published in *The Wall Street Journal*.

No Manufacturing Plans

Frank Hesford, manager of the Computer Group, indicated that the company at this time has no plans to manufacture the George line beyond the two-year period fixed last July.

Some of Pertec's Service Division employees will be trained to support the George line, therby increasing service availability to Milacron's customers, Harmon noted.

Service revenues are estimated at more than $500,000 for the first year of the five years covered in the agreement. Harmon added that the agreement could be extended, depending on the life cycle of the installed base.

Up to 12% Semi Growth Dip Forecast for Coming Year

(Continued from Page 85)

showed how the economics of the semiconductor industry would affect Semi's constituents.

Aside from making growth projections, Rosen talked about how integrated circuit (IC) makers would react to an industry deceleration and discussed the threats of international competition and future opportunities for the semiconductor industry.

Rosen pointed out the last expansion in the semiconductor industry — occurring between 1970 and 1974 — continued for almost 3-1/2 years. Noting that the industry has shown cyclical sensitivity, he said it has not been expanding for about 3-1/2 years since that last downturn, so a deceleration in the near future would not be a surprise.

However, Rosen noted that for the first time, managers of semiconductor firms are admitting that cutting capital spending was a major mistake made in 1974 and 1975. The 10 major semiconductor firms, according to Rosen, increased their capital spending budgets 31% in 1977, and a 51% increase in capital spending is projected for 1978.

Moreover, he said the industry is no longer plagued with lead time, double inventory and excess ordering problems as was the case in 1973 and 1974.

Message to Managers

Rosen's message for managers of semiconductor companies — facing an upcoming deceleration period with possible dips in earnings — is to manage their companies as if they were privately held. He advised managers to focus less on the short term and more on the electronics explosion expected to take place in the early to mid-1980s.

However, Rosen did note profit margins of semiconductor firms have been declining despite the spectacular boom IC makers are experiencing this year.

Pointing to the smooth 20% yearly growth of the IC industry in the past, Rosen said the market for ICs is highly elastic and that trait will lead to future industry demand.

Technological advances — which permit increasing chip density — are fueling the market's elasticity because the price of a chip is remaining stable or even falling regardless of the density. As chips have increased in density from 1K of random-access memory (RAM) to 64K RAM, Rosen explained, the per-chip price has been about $4, and there is "no near-term limit to device density."

'Home-Grown Trend'

While Rosen believes long-range growth prospects for IC makers are healthy, he did not dismiss the growing nationalistic trend in various countries which is causing "home-grown" semiconductor industries to develop. Semiconductor industries are burgeoning in France, Germany, China, USSR, the UK, Japan and Korea, Rosen noted, and these countries believe they will become Third World nations unless they have stronger IC industries.

Rosen does not consider the Japanese IC industry as the most serious threat to U.S. makers. "U.S. design will be the world industry standard, and the breadth of the Japanese product line is not that great," he said.

On the domestic scene, computer makers such as Data General Corp. and Hewlett-Packard Co. have established captive IC companies, but the trend, Rosen claimed, should not present a threat to the industry. This move on the part of computer companies should help them meet their own needs for small volumes of ICs — or customized products — which they cannot easily obtain from semiconductor makers, who prefer to produce large-volume runs.

The age of the IC has arrived, with semiconductor companies selling microprocessors in large numbers to various companies for use in products from blenders to telephones.

Contract Add-On Lifts Sanders' IBM Business

NASHUA, N.H. — Sanders Associates, Inc. has received an additional $2.3 million contract add-on from IBM for production of interactive computer graphics equipment for the IBM 3250 graphics display system.

With the add-on contract, IBM has now awarded Sanders more than $20 million since the initial production contract of approximately $18 million was agreed upon in November 1977. That was the month Sanders successfully completed development work in cooperation with IBM under an agreement reached in January 1977 [CW, Jan. 31, 1977].

In the January agreement, Sanders consented to drop its antitrust suit against IBM which was pending in the U.S. District Court in New Hampshire. IBM, in turn, agreed to pay Sanders $4 million for "applications of Sanders technology to be used in future IBM products."

Payments of $3 million were also agreed upon for "certain minimum production commitments," according to joint statements issued by the firms at the time of the settlement.

In addition, IBM agreed to purchase certain products from Sanders inventory while Sanders agreed to grant IBM "a nonexclusive license to certain Sanders patents."

The lawsuit filed in January 1975 by Sanders charged that IBM's actions against Sanders' terminal products violated antitrust laws. At the time, industry sources believed Sanders had one of the best chances of proving predatory marketing practices on IBM's part because its case revolved around the relatively narrow CRT sphere.

Shortly after the settlement with IBM, Sanders sold to Harris Corp. its Data Systems Division, which consisted of the products involved in the antitrust suit.

The equipment covered in the IBM contract was formerly part of the Military Data Systems Division at Sanders, later renamed the Information Products Division.

Further add-on contracts are expected from IBM, a Sanders spokesman said.

Contracts

Tri-Data has signed a $2 million contract wth Teradyne, Inc. covering the purchase of more than 400 Cartfile magnetic tape systems, spare parts and Series 1000 magnetic tape cartridges.

PRC Data Services Co. has been awarded a contract by the U.S. Marine Corps to provide test and evaluation, systems engineering, systems requirements analysis, programming and other computer-oriented services. All work will be done at Camp Pendleton, Calif. The two-year contract with a one-year option has a potential value of more than $5 million.

The Software Co. has entered into a contract with Republic Gymsum Co. to design, develop and install an interactive software package on a Univac BC/7 system.

General Datacomm Industries, Inc. and the Bell System Purchased Products Division have entered into a national agreement to facilitate the purchase of General Datacomm's Netcon-5 Network Diagnostic Control System.

Integrated Software Systems Corp. (Issco) has been awarded a contract from ICI Americas, Inc. of Wilmington, Del., for Issco's Disspla graphics software system.

The Computer Communications Group (CCG) of the TransCanada Telephone System has received a contract worth more than $2 million annually from Loto Canada. CCG will provide the data transmission facilities for Loto's weekly game beginning late this fall.

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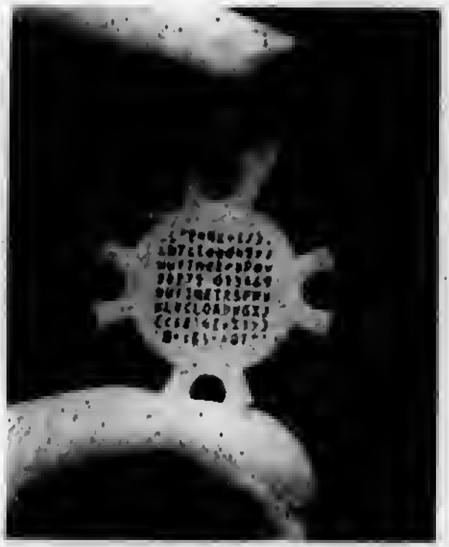

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Observers Describe IBM's 8100 as 'Aggressive'

(Continued from Page 85)

makers, Orlansky indicated, because it could lop off a portion of their upper end business.

In the past, IBM has been weak in this part of the business both for stand-alone and distributed processing applications, according to Orlansky. He believes the 8100 will close that gap and affect the marketing plans of mini firms.

However, a spokesman for Data General Corp., while admitting that the IBM move was considered aggressive, pointed out that the 8100 systems will not be delivered for at least another year.

"A year is a long time in this business. We usually don't announce systems until they are ready for delivery," he said, indicating the mini makers may have plans to use larger memory chips and be more competitive against the 8100 than their current product lines suggest.

'A Shocker'

Robert Fertig, head of the Technology Analysis Group at Advanced Computer Techniques Corp., called the 8100 announcement a "shocker," even though many of the IBM moves had been predicted.

What was shocking was the amount of new technology and the aggressiveness of the pricing structure, he said, noting, for example, that while IBM's work on 64K chips was well known, few expected their announcement so early.

Pointing to the 8100's wide range of capabilities, Fertig predicted it will be strong competition for small business system makers and the intelligent terminal makers as well as the more main line minicomputer companies.

Harry Edelson, a computer analyst with Drexel, Burham and Lambert, Inc., said it is significant that the 8100 system now gives IBM's Data Processing Division (DPD) an entry-level product to sell.

Because the product is marketed by DPD rather than the firm's General Systems Division, there will be a lot more marketing muscle behind it, he believes.

But while it can be used as an entry-level system, Edelson said he expected most of the 8100's applications to come in large distributed networks, where the DPD salesmen have not really had a competitive product. "I'll bet the DPD salesmen can't wait to get their hands on this for their large accounts," he commented.

The 64K-bit chip certainly indicates the direction IBM is taking in the memory market, he said. He added, however, that the 64K chips apparently are not fast enough at this point for large mainframe applications.

The pricing of IBM's older memory available for the 8140 processor, is considerably below the cost of the same memory for the 370 line, he noted. On a 1M-byte basis, the 8140 memory would cost $49,920, even though it is not available in such large increments for the 8140.

At the same time, IBM is selling the same type of memory to 370 and Series 30 customers for $11,000 per 1M-byte increment.

"I expect we will see IBM drop the price of mainframe memory by at least half in the near future," Edelson said. Such a price reduction is "long overdue."

Wespercorp, DDS Talk Of Merger

ANAHEIM, Calif. — Wespercorp and Diversified Data Systems, Inc. (DDS) have announced their intent to merge, with the surviving company to be Wespercorp.

Randy Knapp, president of Wespercorp, said interest in the merger developed when Wespercorp evaluated and later installed a DDS business management system.

The system is an on-line, data base-oriented manufacturing control system called Summit which provides electronic management of sales order entry and purchase order tasks, inventory control, cost accounting and standard accounting functions which are all finalized into a general ledger module.

Relocating

When the merger is finalized, DDS will become a semiautonomous division of Wespercorp. It will relocate from Tucson, Ariz., to Orange County, Calif. by the second quarter of 1979.

DDS, founded in 1970, specializes in minicomputer software. Summit will be the major product produced during 1979, Knapp said.

Wespercorp was founded in 1975 as Western Peripherals, Inc. For its latest fiscal year ended June 30, it had earnings of $698,000 or 42 cents a share, compared with 1977 earnings of $286,000 or 17 cents a share.

Sales for the year totaled $5.6 million, more than double 1977 revenues of $2.6 million.

In commenting on the fiscal year's performance, Knapp said that during the year the company was reorganized, a division added and several products introduced.

The new division, Wesperline, manufactures cabinets, racks and related equipment for minicomputer components from other manufacturers.

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Ronald M. Clevenger (left) is the Data Processing Manager of Gilmore Steel Corporation, Portland, Oregon. Dean Chambers is NCR District Manager.

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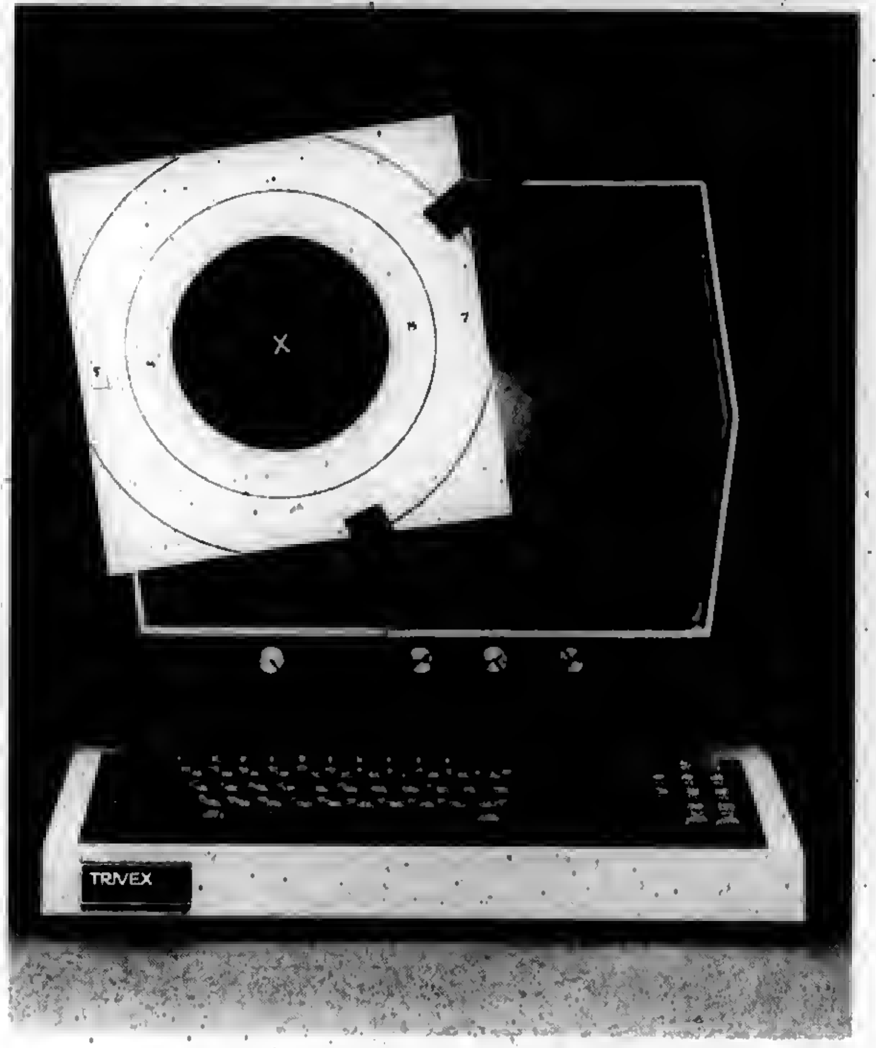

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DPD, GSD Openly Competing

Debut of 8100 Means War for IBM Divisions

By E. Drake Lundell Jr.
CW Staff

Analysis

With its recent 8100 product announcement [CW, Oct. 9], IBM moved firmly from a policy of "contention" between internal product programs to one of open competition between its major divisions.

The trend is sure to continue. The next major round is expected later this month, when IBM's General Systems Division (GSD) announces its Pacific minicomputer product, which will compete with the lower end of the Data Processing Division's (DPD) computer line, much like the 8100 competes with GSD products.

> *'While most analysts feel IBM's full strategy is not crystal clear, they do feel IBM is certainly moving toward a General Motors-like structure in which all divisions compete aggressively with each other.*

IBM is not only allowing its two divisions concerned with computers to compete with each other, it is also apparently allowing them to go after business that was previously the preserve of the Office Products Division (OPD).

While most analysts feel IBM's full strategy is not crystal clear, they do feel IBM is certainly moving toward a General Motors-like structure in which all divisions compete aggressively with each other.

In the past, IBM's policy was one of internal "contention" between various product programs. For example, had there been six minicomputer development programs under way at one time, top corporate management would have evaluated them, chosen the best and assigned it to the proper marketing division. The other projects would be essentially scrapped.

During this period, the "turf" of the various divisions was also clear: GSD handled small business systems and minicomputers; DPD handled medium- and large-scale systems; OPD handled typewriters and other office equipment. DPD was — and is — the largest division, followed by GSD and OPD.

With the advent of distributed processing, however, equipment from GSD began to compete with DPD gear for some orders. In other cases, users needed equipment from both divisions in order to meet their application needs.

For a while there was a great deal of internal competition and DPD salesmen almost refused to cooperate with GSD. IBM then began splitting commissions so DPD personnel would be better rewarded for sales they made of GSD equipment.

Conscious Decision

But with the 8100 announcement, IBM is clearly letting DPD invade the GSD's turf — and GSD is expected to retaliate later this month with Pacific, which will initially range in size up to the level of large System/3s, but eventually will have the power of a 370/158, clearly moving GSD into the realm of medium-scale systems.

IBM has apparently made a conscious decision to move in this direction.

"We realize we are certainly overlapping with GSD," a DPD spokesman said at the time of the 8100 announcement. "We feel this is a healthy development."

In the long run, he said, the move will provide users with a greater variety of systems from which to choose and will benefit users by allowing them to pick the best system for their needs.

With the competition among the divisions, users will now have another source to check out when looking for computer sytems — another source within IBM.

General Motors follows the same type of strategy. That corporation really doesn't care if Chevrolet, Buick or Oldsmobile sells a customer a car — as long as Ford doesn't get the order.

IBM is not only opening up competition in the computer area, but also in the office products area.

Along with the 8100 announcement DPD also introduced the 3730 office communications system, which is essentially a text and word processing system with some DP capability.

In a stand-alone mode, the system should supply competition to some of the automatic typewriting equipment already marketed by OPD and certainly for planned clustered word processing systems from that division.

At the same time, the system can be interconnected with 370 mainframes so users can transfer text among various 3730 systems in electronic mail applications, giving it a bonus compared with presently available products from its sister division.

In the past, several industry analysts indicated that IBM might move in this direction — independent and competing divisions — so its structure would permit it to be split up, should it be forced to negotiate a consent decree with the government or encounter an adverse judgement in its decade-long antitrust battle with the government.

However, most now see the move motivated less by possible antitrust considerations and more by the need to make its sales staff more competitive.

By playing off the divisions against each other, competition will be increased in the IBM world — but the result of the competitive situation should be an increase in revenues to the company as a whole, they believe.

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CCIA Elects Officers, New Members

ARLINGTON, Va. — The Computer and Communications Industry Association (CCIA) elected a new chairman of the board, four executive vice-chairmen and seven new members at its annual meeting held in Minneapolis recently.

With the election, the total number of corporate members is 60.

The new chairman of the board is Harold E. O'Kelley, chairman and president of Datapoint Corp.

The four new vice-chairmen are Jesse Aweida, chairman and president of Storage Technology Corp.; John E. Jones, chairman and president of Cummins-Allison Corp.; Raymond P. Kurshan, chairman and president of Management Assistance, Inc.; and Robert Tetherow, executive vice-president of Applied Magnetics Corp.

Newly elected corporate members and their representatives to the association include Computer Communications, Inc., represented by Raymond High, chairman and president; Cray Research, Inc., represented by John Rollwagen, president; Information Magnetics Corp., represented by Michael Faherty, chairman; Magnuson Systems Corp., represented by Paul Magnuson, chairman and chief executive officer; Multiple Access Ltd. of Canada, represented by President John McCutcheon; Qantel Systems Corp., represented by Douglas Baker, president; and Western Digital Corp. represented by C.W. Missler, chairman and president.

Nominations of new officers are made by the 14-member executive committee staffed to represent companies of all sizes from the various sectors of the industry. The nominations are then presented to the full membership for election.

The next CCIA meeting will be held at the Breakers in Palm Beach, Fla. The agenda has not yet been finalized, but a spokeswoman for CCIA said the meeting will include two technology forecast sessions and a presentation by Harry Edelson, vice-president of research for Drexel Burnham Lambert, Inc.

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Microcomputer Programming and Software Support
Microcomputer applications, programming practices, software tools, programming languages, and cost/performance tradeoffs in microcomputer programming are surveyed by Imsong Lee, founder and president of Digital Electronics Corp. and professor of electrical engineering at UC Berkeley. (Catalog Number 213) Price: Members, $9.00; non-members, $12.00

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Rivals of ACS Raise Questions About Service

(Continued from Page 85)

ices under the terms of its 1956 Consent Decree with the FCC.

Cbema also pointed out that ACS would put AT&T in competition with itself because the company makes its DDS lines available to private companies to create their own data networks. As a result, the association said, AT&T would have an unfair advantage over its competitors.

Cbema President Vico Henriques, in a letter to Sen. John Glenn, chairman of the Senate subcommittee on federal services, wrote that ACS "appears to go well beyond the provision of communications common carriage," which AT&T is allowed to offer.

Other Than Common Carriage

"It is the concern of our association that much [of ACS] appears to be other than common carriage and infringes on the provision of DP services," Henriques said in the letter, a copy of which was filed with the FCC.

He added that ACS "has the strong overtones of an electronic mail system," which, he said, would pose a substantial threat to the U.S. Postal Service.

The CCIA was more direct in its comments to the FCC. ACS, the associations said, is "AT&T's major attempt at entry into the DP field to date."

The CCIA said it is extremely concerned about potential anticompetitive effects of ACS on firms already providing communications services.

The association said ACS presents "three distinct levels of service offerings; a packet-switched data communications service, an electronic message service and a data processing service."

Vague and Unclear

The ACS proposal is very vague and unclear, according to the CCIA, which recommended the FCC hold a major inquiry to determine exactly what kinds of services AT&T intends to offer.

The Independent Data Communications Manufacturers Association (IDCMA) joined Cbema in raising the question of cost accounting for ACS. "Answers to questions about the relationships of ACS facilities and equipment with those facilities and equipment used for DDS are clearly necessary," the IDCMA told the FCC.

Pullen noted that the FCC's Computer Inquiry, scheduled for completion by the end of the year, could have a great effect on whether or not the ACS offering is approved by the commission.

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Zaire Now Has 'Veritable DP Constitution'

By Bohdan O. Szuprowicz
Special to CW

KINSHASA, Zaire — September marked the first anniversary of the signing of the order for the creation of a Presidential Information Science Service (SPI) in the Central African Republic of Zaire. It was yet another high-level order regulating the development of DP in Zaire signed into law here by President Mobutu Sese Seko Kuku Ngbendu Wa Za Banga.

Since November 1972, when the Service de l'Informatique au Zaire (Zaire Data Processing Service) was created; also by presidential fiat, there have been several orders outlining development and control of DP budgeting, hardware acquisition and utilization, establishment of a state data bank and even supply of software and training services. This series of presidential orders has now come to resemble a veritable DP constitution of Zaire.

Although in mid-1976 there were only 52 computers reported operating in Zaire, DP developments in this country are important because it is regarded as a crucial state in the development of tropical Africa. It is also a leading French-speaking African country and many of its innovations may be followed in other African nations with similar language and trade affiliations.

The Marxist rebel invasion of the mineral-rich Shaba province in May 1978 also focused world attention once again on Zaire and its future development plans and prospects.

In fact, DP end users all over the world, even those without any interest in foreign affairs, could not help being affected by the recent developments in Zaire. Although the country is best known for its large copper deposits, Zaire also produces about 60% of the world's cobalt, which is widely used in permanent magnets for electric motors. There are probably 30 to 40 electric motors in a typical DP installation — in various disk drives, tape transports, printers and readers and wherever information-bearing media have to be moved automatically.

Because all the industrialized countries, except the Soviet Union, must import most of the cobalt they need, disruptions in Zaire had an immediate effect on cobalt prices. Those who had a recent need to replace a burned-out motor are probably already aware of the jump in motor prices as a result.

The Zairean national orders regulating DP development in that country are nothing new or unexpected. In fact, the government has been a pioneer in DP use, and one of the first and largest computer centers in Zaire was established by the Ministry of Finance. Originally equipped with an IBM 360/40, that center was upgraded to an IBM 370/155 as early as 1972.

To this day, IBM is by far the major supplier of DP hardware in Zaire with only minor inroads being made by minicomputer manufacturers such as Hewlett-Packard Co., whose equipment is going into a documentation center of the World Trade Center here.

Early Application

Control of customs duty payments was one of the first applications for Zairean computers. This is understandable because foreign trade is an important segment of the economy and source of revenues. Interestingly, the Ministry of Finance also used its computers to simulate what the diplomatic spending of Zairean embassies abroad should be which turned out to be considerably less than the actual bills presented to the government by its ambassadors.

With such promising applications, perhaps it is not surprising that the Zairean government took a liking to its new-found toy and decided to keep control of DP as a means of learning more about its own economy. Early in 1976, the Ministry of Finance was the moving spirit behind the first DP congress in Zaire that assembled as many as 500 participants at the Intercontinental Hotel here. Several recommendations resulted from "round-table" discussions held on that occasion and most have now been signed into law by presidential order.

Basic to all of those is probably the order dating from May 1976 eatablishing a Permanent Council for Information Science in Zaire (Copiz), which became a specialized administrative energy agency responsible for advice and suggestions, preparation of programs and plans, and presentation of any "useful proposals concerning any matter which is directly or indirectly connected with informatics in the Republic of Zaire."

Needless to say, the purchase of computers in Zaire is subject to authorization by the Copiz organization, which also has the power to order access to a particular computer center by outside end-users. This is all in order to make better use of scarce resources such as computers.

Acquisition of training services and utilization of software are also controlled by Copiz regulations, and the Ministry of Telecommunications is being urged to work closely with the DP watchdog agency.

So if you're headed for Zaire with your special fact-finding data base software, you better plan on touching base with Copiz as a start. Preferably you should seek out a member of the Copiz Secretariat because their tenure expires only "when a member dies, resigns or loses status . . . " for which he was appointed. So sayeth the presidential order signed by Mobutu, general of the armed forces.

Qume to Become Part of ITT

HAYWARD, Calif. — Qume Corp. and International Telephone and Telegraph Corp. (ITT) have reached an agreement in principle whereby Qume will become part of the ITT system.

Qume will retain its corporate name and current management but will become part of ITT's Business Systems and Communications Group.

Under the terms of the agreement, 4.7 million shares of ITT stock will be issued in exchange for Qume shares on a one-for-one basis.

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Supershorts

Bank of America has announced the name change of its automated teller service. The service, formerly known as "BankAmeriteller," is now known as Versatel."

— — —

International Data Corp. (IDC) has announced the opening of a West Coast editorial bureau to serve its seven computer industry newsletters. The bureau will open Nov. 1 at IDC's Los Angeles office.

— — —

Russ Kelly has announced the formation of SOTA DP Associates, Taylors, SC. The firm will specialize in programming, design and consulting activities for Honeywell, Inc. systems users.

Data Terminals and Communications (DTC) has announced the sale of $250,000 worth of its Taskmaster small business systems to Telema, A.B. of Sweden, which will act as DTC's exclusive distributor in that country.

— — —

Data Processing Power Corp. (DPP) has announced that Data Supplies, Inc. of Atlanta has signed an agreement to market DPP's. Powermobile line of products throughout the Southeast.

— — —

Two new distributors have been added to Fujitsu America, Inc.'s Component Sales Division: Matex International Inc. of Portland, Ore., and J.&S. Electronics of Dallas, Texas.

Pertec Computer Corp.'s PCC Service Division has signed a contract with Unitech, Inc. to provide third-party service for Unitech's line of remote batch/data entry terminals. This service will supplement Unitech's own network of service representatives in maintaining UT-1 and UT-2 remote batch terminals at end-user locations nationwide. PCC Service has also signed a two-year agreement with Printronix, Inc. to become one of the organizations providing field maintenance for Printronix' P-300 and P-150 line printers.

— — —

Rand Information Systems, Inc.has renamed the division that provides data services to casualty insurance companies and brokers. Formerly known as Montgomery-McDonald, Inc., the division is now known as Rand Insurance Systems.

— — —

Six representatives have been added to Digital Communications Associates, Inc.'s worldwide marketing system.

U.S. Continues Positive Balance Of DP Trade

WASHINGTON, D.C. — The U.S. continued to register a positive balance of trade in data processing and business equipment in the second quarter of 1978, according to figures released here recently.

Second-quarter figures made public by the Computer and Business Equipment Manufacturers Association (Cbema) showed a 22.7% increase in the balance of trade compared with the same quarter in 1977.

In dollars, the second quarter of 1978 showed a positive balance of $678.8 million while the same period in 1977 had a positive balance of $553.5 million.

Although exports for the second quarter rose 31% from $940.3 million to $1.232 billion, imports were up 43% from $386.9 million to $553.4 million.

Imports of DP equipment rose 72% during the quarter, reaching $52.5 million from $30.4 million in 1977's second quarter, DP equipment made up the major product area contributing to the rise in imports, Cbema said.

Exports of computer and business equipment rose from $769.3 million in the second quarter of 1977 to $990.7 million in this year's period.

Contributing significantly to that improvement, Cbema said, were increases in two categories — DP equipment and parts. Between the two quarterly reporting periods, DP machines, peripherals and related equipment exports increased by $81.1 million while exports of parts and accessories for DP equipment increased by $140.3 million.

The Cbema statistics, compiled from U.S. Department of Commerce data, indicated the ratio of exports to imports was 2:23.

Inforex to Make Beehive Devices

BURLINGTON, Mass. — Inforex, Inc. has acquired the manufacturing rights to the Model B-800 and Model B-103 terminals, designed by Beehive International to Inforex specifications.

Inforex will now manufacture the terminals, which it has been buying since entering into an OEM contract with Beehive in September 1976.

Under the original agreement, Inforex purchased the Beehive terminals for use in its System 7000, its intelligent terminal product line aimed at the distributed processing market.

The acquisition of these manufacturing rights permits Inforex to have closer control over the production and the future evolution of the System 7000, that vendor said.

Now there's more than one way to disseminate your bauds.

See "Data Communications Networks" in our November 27th issue.

Time was, the data communications user had a limited choice between using the public switched telephone network, or leasing private lines. But recent data communications developments are rapidly allowing the user to configure more flexible networks, with greatly increased transmission efficiency, and easy interfacing of terminals and computers to the network.

Computerworld's November 27th Special Report takes a close look at data communications networks, and how they are rapidly making distributed processing technically feasible (as well as affordable). Edited by Ron Frank, *Data Communications Networks* will examine standards for evaluating and establishing effective networks, with articles by vendors and users on design, control and maintenance of the various available networks. We'll also be talking about:

- *Terminal selection — getting the most work out of the right terminal.*
- *Private line vs. public data networks — how users can best utilize either [or both] systems.*
- *Switched networks — choosing between circuit switching, message switching, and packet switching.*
- *Configuring in the '80's — microwave transmission and satellite links.*

Whether you're presently involved with data communications, or just looking, our November 28th Special Report will be of special interest to you. And if you market data communications products or services — this is a good place to get the word out. Ad closing date is November 10, and your *Computerworld* representative can give you all the details. Or, to reserve space, call Terry Williams at (617) 965-5800.

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Executive Corner

• Thomas R. Ambler has been promoted to senior vice-president of the Systems Division at Kranzley & Co. Louis C. Cozens has been named vice-president of system assurance at the firm.

• Peter R. Geddis has been named sales manager of the Los Angeles district at Southern Pacific Communications Co.

• Thomas L. Campbell has been named vice-president of marketing at Rapidata, Inc.

• F. Jack Miller has been appointed vice-president of marketing for Burndy Corp.'s new Termac Division.

• Justus F. Lowe Jr. has been named executive vice-president at Softech, Inc. Other appointments include Dr. Jorge E. Rodriquez as senior vice-president and general manager of the company's Federal Systems Division; Ben Goodwin as vice-president of government marketing; and Robert J. Kalil as vice-president of administration and finance.

• Dick Bright has become vice-president of ICL, Inc.'s Americas Operations and in addition will become president of ICL, Inc.

• Melvin W. Redmond Jr., Dr. Roland E. Webber and Harold S. Hemstreet have been elected vice-presidents by the board of directors at Perkin-Elmer Corp.

• John N. Lemasters has been promoted to the post of corporate vice-president, group executive at Harris Corp.

• Leonard A. Palmer Jr. has been named vice-president of the Data Processing and Systems Division at Remote Computing Corp.

• Dr. Gyan C. Jain has been appointed vice-president of systems engineering at Documation, Inc.

• Earl Wantland has been named to the board of directors at Floating Point Systems, Inc.

• Robert A. Leonard has joined Threshold Technology, Inc. as chairman and chief executive officer. He succeeds Edward Smith, who has become chairman of the board's financing committee.

• Gerald R. Cicconi has been appointed president and chief executive officer af Data Access Systems, Inc.

• Dr. Robert C. McFarlane has been elected to the board of directors of Scientific Software Corp.

• Richard E. Pufliese has been appointed vice-president of manufacturing at Durango Systems, Inc.

• Larry S. Goldfarb has been promoted to vice-president and sales manager at Computer Resources Group, Inc.

• Mel Synder has been promoted to sales manager, western area, at Zilog, Inc. Douglas Broyles has become vice-president and general manager of the firm's newly formed Systems Division.

• William F. Tilley has been named president of National Computer Communications Corp.

• Dhruba Sen has been promoted to director of applications at Tesdata Systems Corp.

• Clayton Rea has been named branch manager in Pittsburgh for U.S. Datacorp. Bruce Bonnet has been named Oklahoma City branch manager for the firm.

• Dr. Earl D. Jacobs has been appointed corporate staff vice-president and Douglas L. Cutsforth has been named general manager of Computer Automation, Inc.'s Industrial Products Division.

• Jerry Brandt, president of Byte Industries, has been elected to the board of directors and promoted to chief operations officer of Logical Machine Corp.

• Ray Ball has been appointed director of marketing at Able Computer Technology.

• Kevin M. Mahan has been named western regional manager for Rapidata, Inc. Max V. Kupferman has been appointed district manager of the firm's Los Angeles district sales office.

• Juan Sprindys will be responsible for sales in the Midwest for Plessey Materials Corp. King Hsu has been appointed research and development engineer at the firm.

• Thomas A. Brancati has joined Dynamic Sciences as vice-president and director of electronic systems.

• Ray Kristiansen has been named Western regional sales manager at PerSci, Inc.

• John F. Gifford has been made a vice-president of Intersil, Inc.

• Michael M. Hoeffler has been named manager of the Direct Access Radar Channel program at Raytheon Co.'s Equipment Division.

• Colman Daniel has been named component marketing director at Hamilton/Avnet Electronics.

• William A. Krepick has been named product manager for Rolm Corp.'s Telecommunications Division.

• William H. Krause has been appointed to the new position of sales administration manager for semiconductor products at Hughes Aircraft Co.'s Microelectronic Products Division.

• Don Leach has been appointed marketing manager of test equipment for Interstate Electronics Corp.

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TI Offering 64K RAM Samples This Month

DALLAS — Sample quantities of a 64K dynamic random-access memory (RAM) priced at $125 each will be available late this month, according to Texas Instruments, Inc. The firm has scheduled volume production for the first quarter of 1979.

Organized as 64K by 1, the TMS 4164 is expected to be the first available single 5V 64K dynamic RAM on the market, a spokesman said. It comes in a 16-pin, 300-mil standard dual-in-line package, complying with Jedec standardized pin-out requirements and allowing upward compatibility with the 16K dynamic RAM.

The TMS 4164 single 5V power supply design is TTL-compatible, offers considerably lower power dissipation and is more immune to system noise, TI claimed. The 5V operation reduces the effective electric field across gate oxide, offering higher system reliablity, the spokesman added.

In addition, a compact layout and optimized design/process combination for 5V-only operation results in improved performance, he asserted.

Access times range from 100 to 150 nsec maximum with minimum cycle times of 200 to 250 nsec. Power dissipation is 200 mW maximum or 3 microwatts maximum per bit.

Reduced Power

Comparing the 462 mW power dissipation of the 16K RAM at 375 nsec cycle time, the total maximum power dissipation of the 64K RAM is reduced by 60% with improved cycle times while bit density is quadrupled, TI said, claiming this advancement allows practically an order of magnitude power per bit improvement.

OEM Products

The TMS 4164 features a 256 cycle refresh with a 4 msec maximum refresh period, as a result of the lower power dissipation. This refresh period is a 100% improvement over the 2 msec refresh period of current 4K and 16K RAMs, the spokesman noted.

The small chip size of 33,000 square mils is a significant contributing factor to lower production costs and improved reliability, he said.

Because of the TMS 4164's refresh compatibility with the 16K RAM, the basic refresh controller timing does not require major changes. The only provision required is for an 8-bit refresh counter/multiplexer when upgrading to 64K from a 16K system.

Also contributing to higher system operating efficiency is a 1.3% to 1.6% refresh overhead time, compared to 2.4% on the 16K RAM, TI said.

Essentially Identical

Two clocks, row address select (RAS) and column address select (CAS) control the gating of the 8-bit addresses so timing characteristics are essentially identical to the TMS 4116 16K RAM. Row address set-up time is 0 nsec; hold time, 15 nsec.

Column address set-up is -5 nsec and RAS/CAS spacing is 15 nsec and 50 nsec. This allows the system designer a full 35 nsec interval to change addresses and bring CAS low, without expanding access time beyond 150 nsec, TI said.

Photomasks for TMS 4164 volume production will be manufactured with electron-beam equipment to control geometrics to better than .25 microns. Projection printing will also be employed to avoid direct contact between photomask and wafer, TI said.

Additionally, geometrics at several critical levels of the TMS 4164 are 2.5 to 3 microns, demanding use of positive photoresist for resolution and delineation control as well as dry processing at critical levels.

TI can be reached at Box 5012, Dallas, Texas 75222.

LSI Circuit Drives 32 LCDs

NEWPORT BEACH, Calif. — A CMOS large-scale integrated circuit that acts as a smart peripheral to a microprocessor to drive up to 32 liquid crystal display (LCD) segments has been introduced by Hughes Aircraft Co.'s Solid-State Products Division.

The LCD driver, designated HLCD 0438, can drive any standard or custom parallel-drive LCD display — either field effect or dynamic scattering — of 7-, 9-, 13- or 16-segment characters, decimals or symbols.

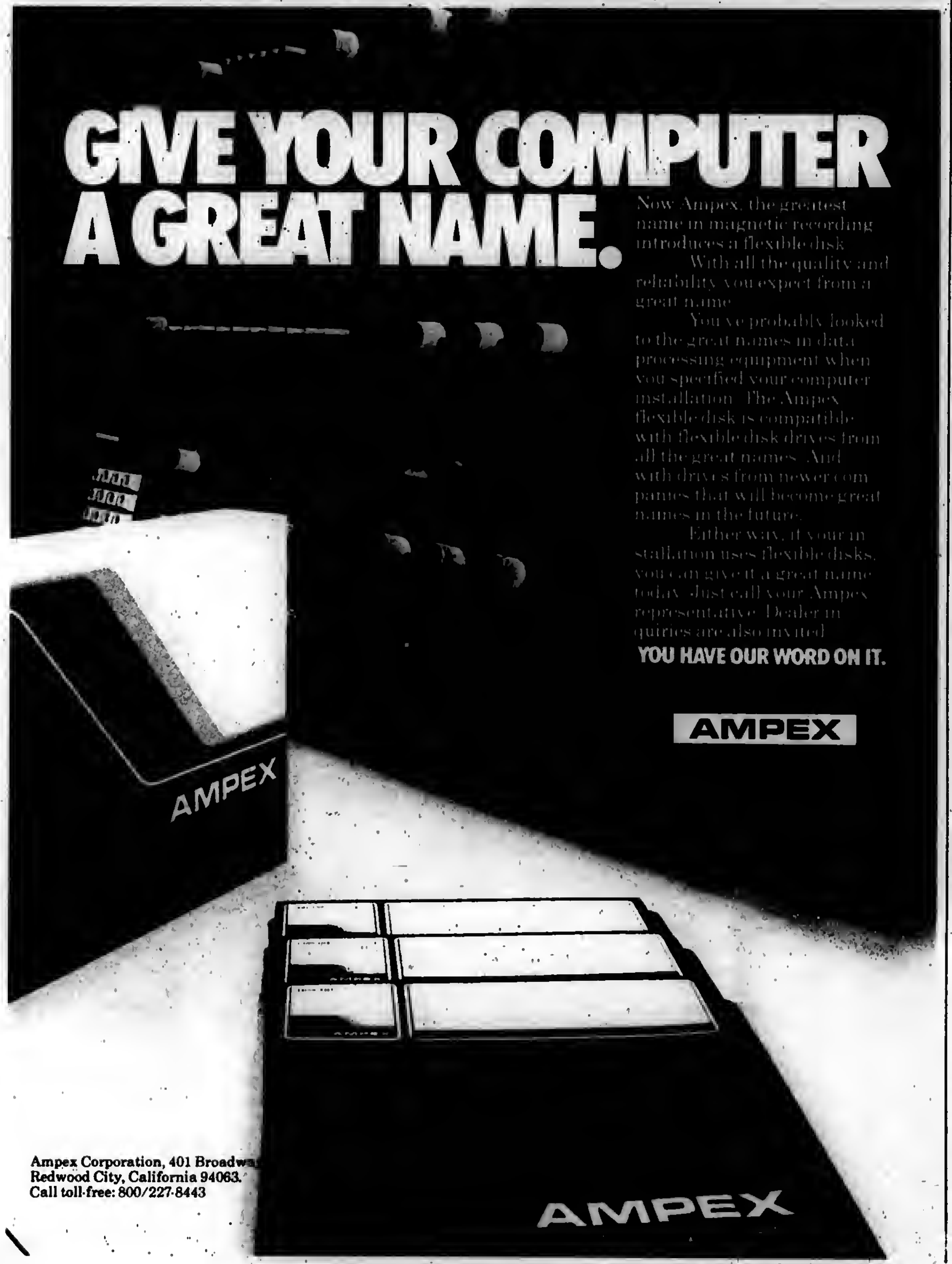
It offers lower cost, higher reliability and smaller size than the several 4000/series discrete devices — shift registers, OR gates, latches, oscillators — that it replaces, Hughes claimed.

Only Three Lines

The circuit requires only three control lines because of its serial input construction, a spokesman said; inputs are CMOS-, NMOS- and T²L-compatible.

Several HLCD 0438s can be cascaded, and the required LCD waveforms can be supplied by the user or can be generated internally by means of an on-chip oscillator. The unit, packaged in a 40-pin dual in-line package, costs $4.45 each in units of 1,000.

Hughes' Solid-State Products Division is at 500 Superior Ave., Newport Beach, Calif. 92663.



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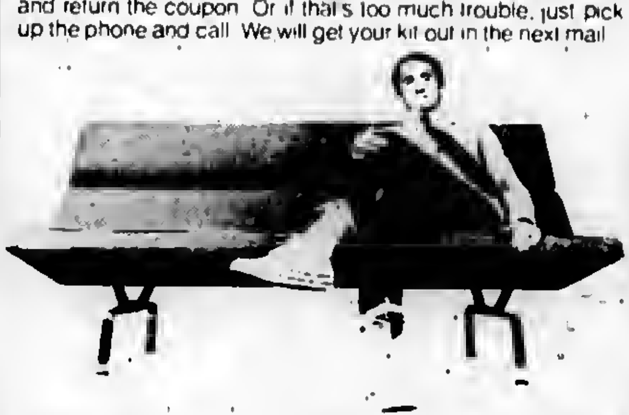

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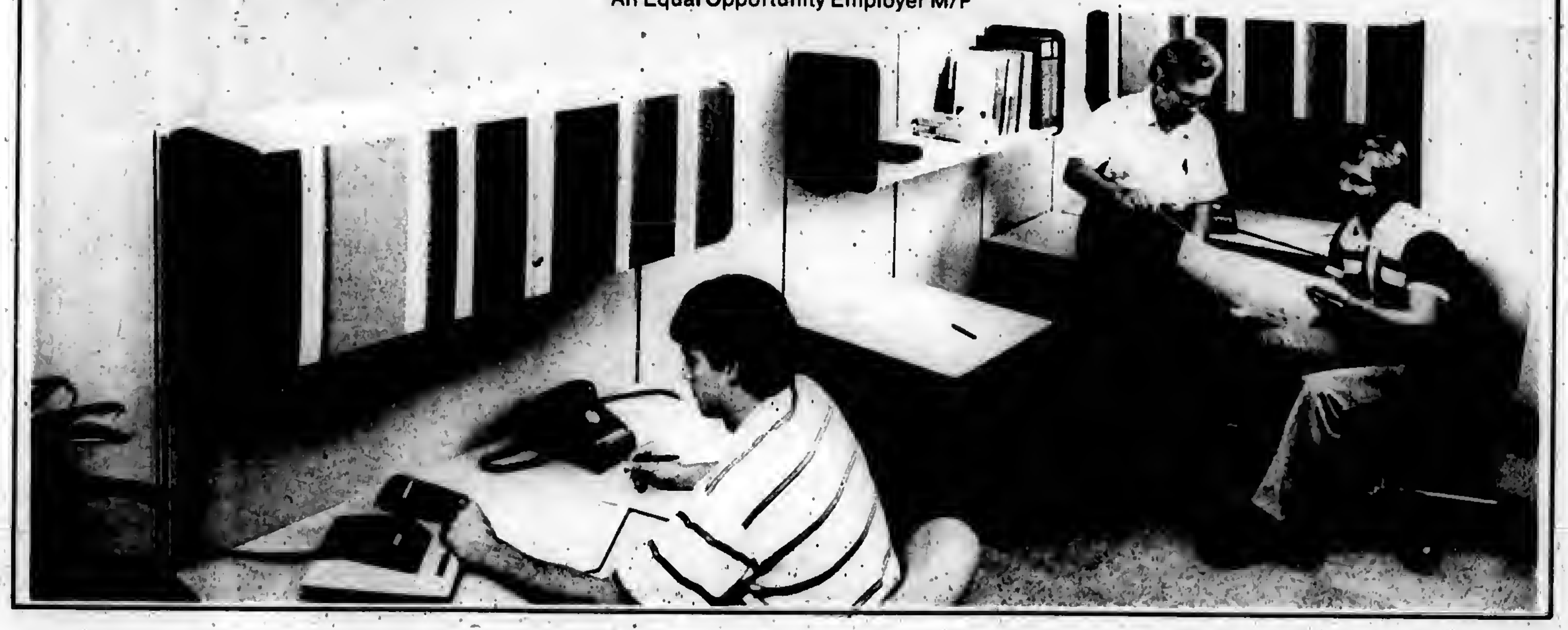

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You will undertake responsibility for the design and implementation of operating subsystems, and contribute to the overall requirements definition of the operating system. You must be capable of implementing thorough knowledge of controlled file access, multi-level directory systems, and sequential, random, and index sequential access methods.

The successful candidate will have a Bachelor's degree in computer science and 3 years experience. You must have participated in the design and implementation of an operating system, and a working knowledge of data base systems and requirements is desirable.

Verification

You will have responsibility for ensuring that a quality systems product is developed. Specifically, you will develop, construct, and execute test programs and participate in design, code, and specification reviews of new software products. In addition, you will help monitor the building of the system in order to rapidly identify schedule inaccuracies and conflicts.

Required are a strong technical background in systems software and at least 2 years experience in developing and/or testing systems software. Your most recent experience should be in the area of compilers or operating systems. A strong background in mathematics is desirable.

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We need a technical writer to produce internal and external system documentation using information obtained from formal design discussions and specifications. Additionally, you will help to establish documentation plans and identify documentation requirements as well as coordinating production of completed manuals.

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Employing your strong technical knowledge and good managerial and leadership skills, you will undertake full responsibility for the design and implementation of the operating system. You must have at least 6 years experience including prior participation in the design and implementation of an operating system. A working knowledge of contemporary minicomputer-based operating systems is desirable.

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Director of University Computing

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The Director will have primary responsibility for policy and planning of future directions and development of all computing at The University of Iowa. The Director will have line responsibility for the University's academic computing center and its administrative data processing unit and staff coordinating relationship with the University Hospitals data processing unit. The directors of the academic and data processing centers who have responsibility for day-to-day operations of these centers will report to the Director of University Computing. The Director will exercise supervisory responsibility for the financial planning and the efficient operation of these centers as well as for the services provided through distributed computing to various research and educational laboratories both on and off the campus.

The Director will be responsible to the Vice President for Finance and University Services in insuring effective operation of the two centers. He or she also will be responsible to the Vice President for Academic Affairs, the Vice President for Educational Development and Research and the Vice President for Finance and University Services who will sit jointly to provide policy guidance concerning the use and availability of computers in support of the University's academic mission. The Director also will receive advice and policy guidance from a University-wide computer services committee.

Characteristics

Required characteristics include demonstrated leadership in an academic, research or high technology industrial setting; knowledge of advanced computer technology; demonstrated capability for working and communicating effectively with diverse groups; and an understanding of financial and management systems in large diversified organizations. Desirable characteristics include experience in the management of large computer systems; academic computing experience; and qualification for a faculty appointment.

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WHAT TECHNOLOGY ARE WE USING?

A strong program that blends IR&D, contracts, and internal projects gives us the opportunity to participate in technological developments at the leading edge of software science. Our current high-technology contracts include:

★ secure operating systems development ★ distributed data-base studies
★ computer network architectures studies

Here are some of the areas which are particularly important to Western Development Laboratories:

UNIX-based* Software Engineering
- PWB/UNIX
- Development support systems
- Software development tools
- Specification languages

* UNIX is a Trademark of Bell Laboratories.

Reliable Systems Technology
- Formal specification & program verification
- Secure computer systems
- Test and validation

Distributed Systems Technology
- Data base management systems
- Real-time data collection/ synthesis
- Local network architectures
- Network protocols
- 1 to 200 MBPS bandwidth

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- Capability-based systems
- Network systems (micro, mini, midi, maxi)

WHAT JOBS DO WE HAVE?

Systems Development Programmer - you will use modern systems programming languages running in a PWB/UNIX environment to develop operating systems, software tools, DBMS's, and network implementations. These positions provide excellent opportunity for technical growth.

Operating System Designer - you will draw upon your experience with several operating systems, your academic training, and your ability to conceptualize and communicate in order to design and specify a new class of operating system. You will learn to express your design in a formal specification language and to subject your specifications to rigorous analysis.

Software Test Specialist - you will break new ground in design of test methods for provably secure systems. Using your familiarity with modern software testing methodologies, you will interact with the systems design team. As a result, you will become familiar with formal mathematical specification techniques for software.

Software Methodology Specialist - you will work in a PWB/UNIX environment to create tools to make the software development process more exact and less error-prone. Your major contribution will be the direction of research and development that leads to the next generation of software tools.

Programming Language Specialist - your knowledge of modern compiler-building technology and formal languages will be used in the evaluation and development of systems programming languages for use in support of our reliable systems technology efforts.

Computer Facility Manager - your experience in systems configuration, maintenance, and operations will be used as you manage the Software Engineering Laboratory that presently consists of two large PDP-11 configurations running PWB/UNIX.

If you have a BS, MS, PhD or equivalent related experience in one or more of the technology areas we've discussed, we'd like to talk with you. At Western Development Laboratories you will receive the professional recognition you deserve, excellent compensation, and one of the best fringe-benefits packages in the industry.

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Please send your resumé and salary requirements to: **Professional Employment, Department PF-92.** If you wish to call, our toll-free number outside of California is **(800) 227-8433;** in California, call collect **(415) 494-7400, ext. 6601. U.S. Citizenship is required for most positions.**

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For immediate consideration, please send resume, salary history and geographical preference to:

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60 Hickory Dr., Waltham, Mass. 02154
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PUBLIC NOTICE

The Louisiana State Education Agency (SEA), Bureau of Management Information Systems (MIS), Division of Research and Development, is seeking qualified individuals for the following positions:

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All positions requira Degree plus 3 or more years experience at a senior level in Information Systems. Data Base experience a strong plus. Send resume, transcript, and references to:

Mr. Michael E. Schouest, Director
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Information Systems
State of Louisiana
Department of Education
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Primary duties will include operational audit of branch bank and haed offica departments. With 34 branches statewida, moderate traval will be requirad. The individual whom we select must work well on an independent basis. Requiraments include 3-5 yaars' prior audit axperianca with a branch banking system, or 2+ years of public accounting.

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to start 1/15/79; teach and evaluate student performance in A.A.S. progr. Prefer B.S. in specialty area in business. Salary range available on request. Reply in writing to Director of Employee Relations. Hudson Valley Community College, Troy, NY 12180. An Equal Opportunity/Affirmative Action Employer, M/F.

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Solid technical background and at least five years experience in a commercial environment, to participate in the development of an on-line business/manufacturing system. Work location: Long Island City.

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NBC is expanding its New York City telecommunications software systems group. We have an immediate-need for a Senior Systems Analyst. This position offers you the opportunity to participate in the continuing development of a sophisticated nationwide distributive communications network. Three years in a large-scale computer environment utilizing telecommunications and one year experience with communications related hardware and software required. Minicomputer experience desirable.

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Eastern States, a well-established Long Island based data processing service company has an unusual opportunity for a professional with the special attributes needed to expertly evaluate state-of-the-art hardware.

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- BS degree in Business or Computer Science discipline.
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Boston State College
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EDUCATION: Degree in Math or Computer Science preferred.

EXPERIENCE: Solid background in COBOL (2-3 years). Experience in educational environment preferred. Knowledge of S.P.S.S. Some experience in systems work desirable. Experience in Documentation. COC experience very desirable.

Salary: range: $13,600.00 to $19,500.00

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Responsible for marketing SIS's financial products and services. Assists customers in use of information services to meet customers' business goals. Participates in all aspects of the marketing process, including the development of plans and strategies, negotiations, pricing and execution of contracts. Direct sales experience and experience in financial analysis and modeling, in addition to knowledge of Data Processing will be required. Base salary, mid $20's and up. (Dept. J.B.)

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Positions are responsible for the development, maintenence, testing and support of software for our new SUNGARD Computer Center. In addition, you will consult with customer's systems personnel in the development of their own software. To qualify, you must possess a working knowledge of VM, MVS, JES 2 and tele-processing software such as TSO/TCAM and a 3705 Emulation. Must possess superior written and oral communications skills. Degree in Computer Science or related field preferred. (Dept A.C.)

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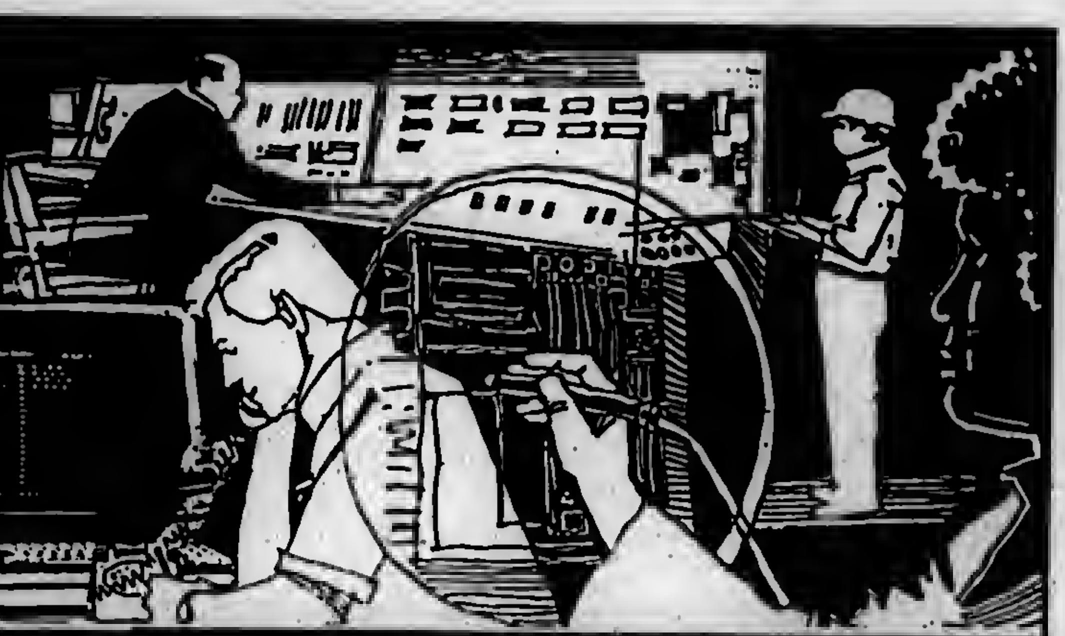

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data processing

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Responsible for performing systems analysis and programming assignments with minimum technical direction. Requires 2 to 4 years experience in information systems and analysis techniques.

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Personnel Director

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Administrative systems. Design through documentation, planning, supervision and instruction require: 2- or 4-year related degree; 2-4 years' Programmer or Analyst experience, including significant BASIC applications and PDP/11 systems; good communication and interpersonal skills. PL/1 and RSTS/E experience helpful. Full-time, year-around position, offering salary based on qualifications, plus full benefits. Call 414-739-3681, or send letter and resume, including expected salary range and names of references to Mr. R. Whitcomb, Personnel Director, P.O. Box 599, Appleton, Wt 54912.

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Minimum of 2 Years Experience.

Environment is a 4 Billion Byte Data Base. Our hardware and software consists of HIS level 66 with GCOS IDS and IBM 370 OS/VS2, IMS, Complete Time Sharing Service, Data Dictionary, Data Communications, etc.

Multiple positions exist which can meet your career objectives. We provide excellent starting salaries, top benefits including life, health, and dental insurances, as well as tuition reimbursement. Even if you're not planning an immediate job change, you should investigate these outstanding opportunities for career growth.

Please forward your detailed resume, including salary history and specifying job of interest, to
Mrs. Noble R. Robinson, Personnel Department, Blue Cross and Blue Shield, 100 Summer Street, Boston, Massachusetts 02106.

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QANTEL CORPORATION

OANTEL CORPORATION
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SENIOR
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Ft. Lauderdale, Florida

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3-5 years experience in financial and/or banking applications; and a solid knowledge of IBM/OS, INTERNALS, SYSGENS, IMS/TSO, and assembler language is essential. A BS degree in Computer Science is preferred.

We offer the qualified candidate an excellent compensation package including relocation. For consideration, call or forward resume in strict confidence to:

Gary Leandre
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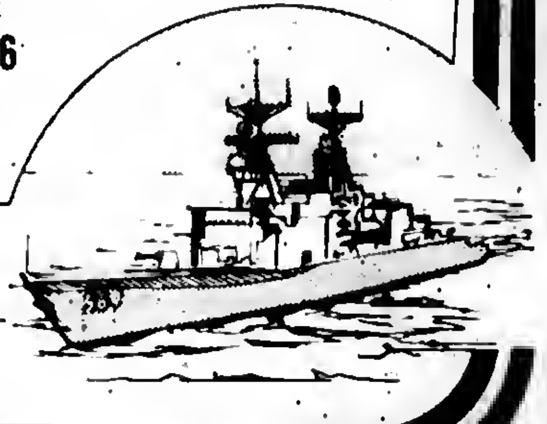

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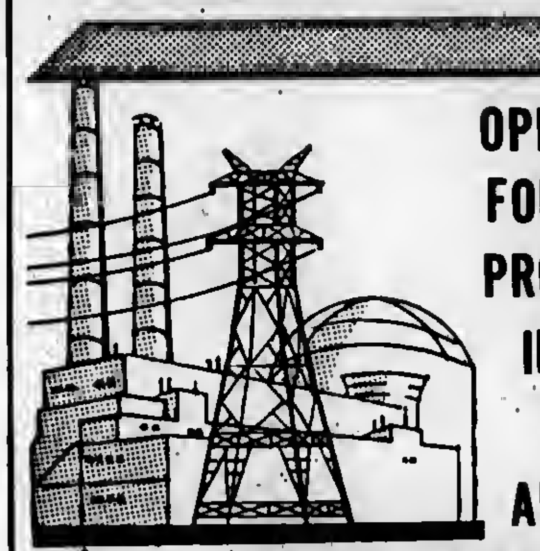

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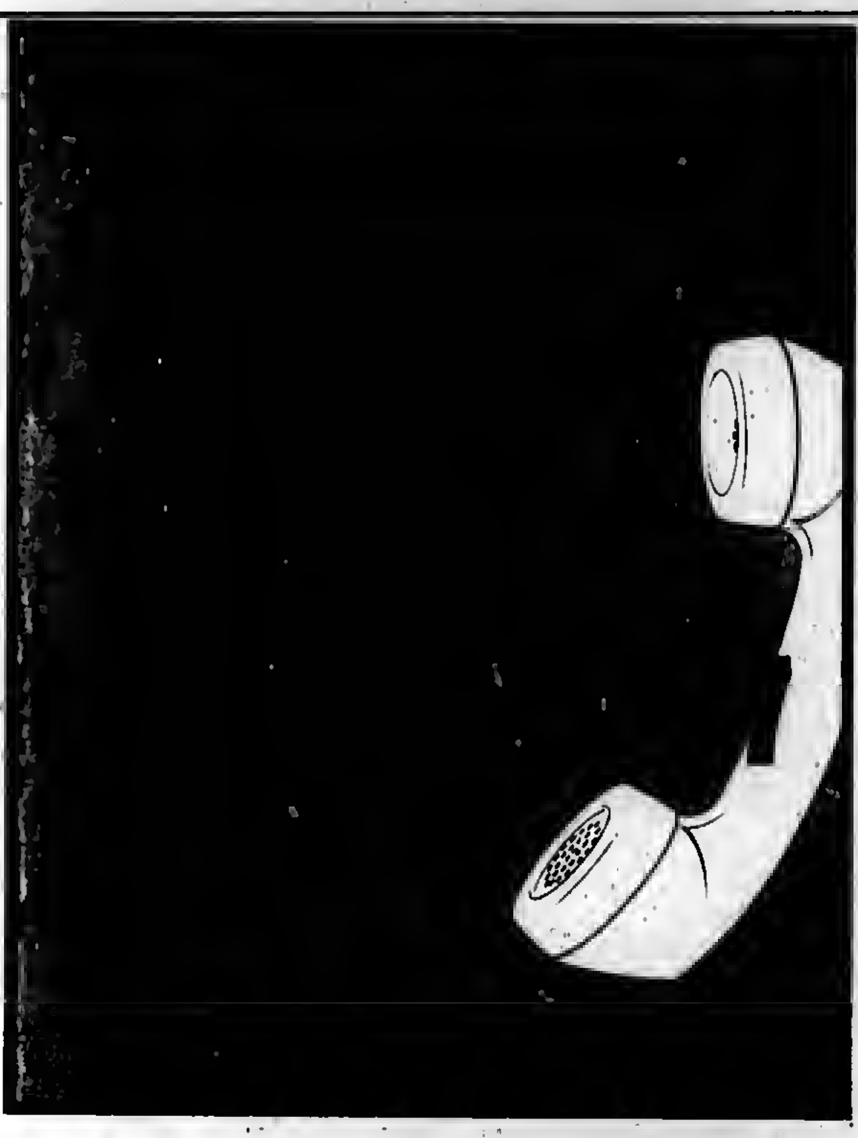

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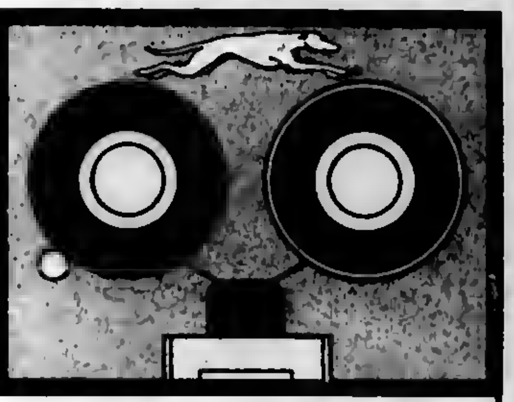

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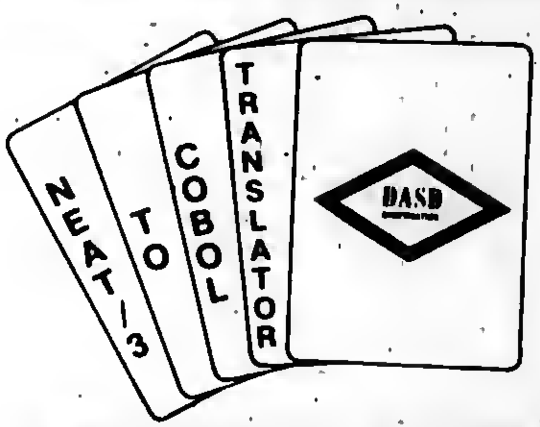

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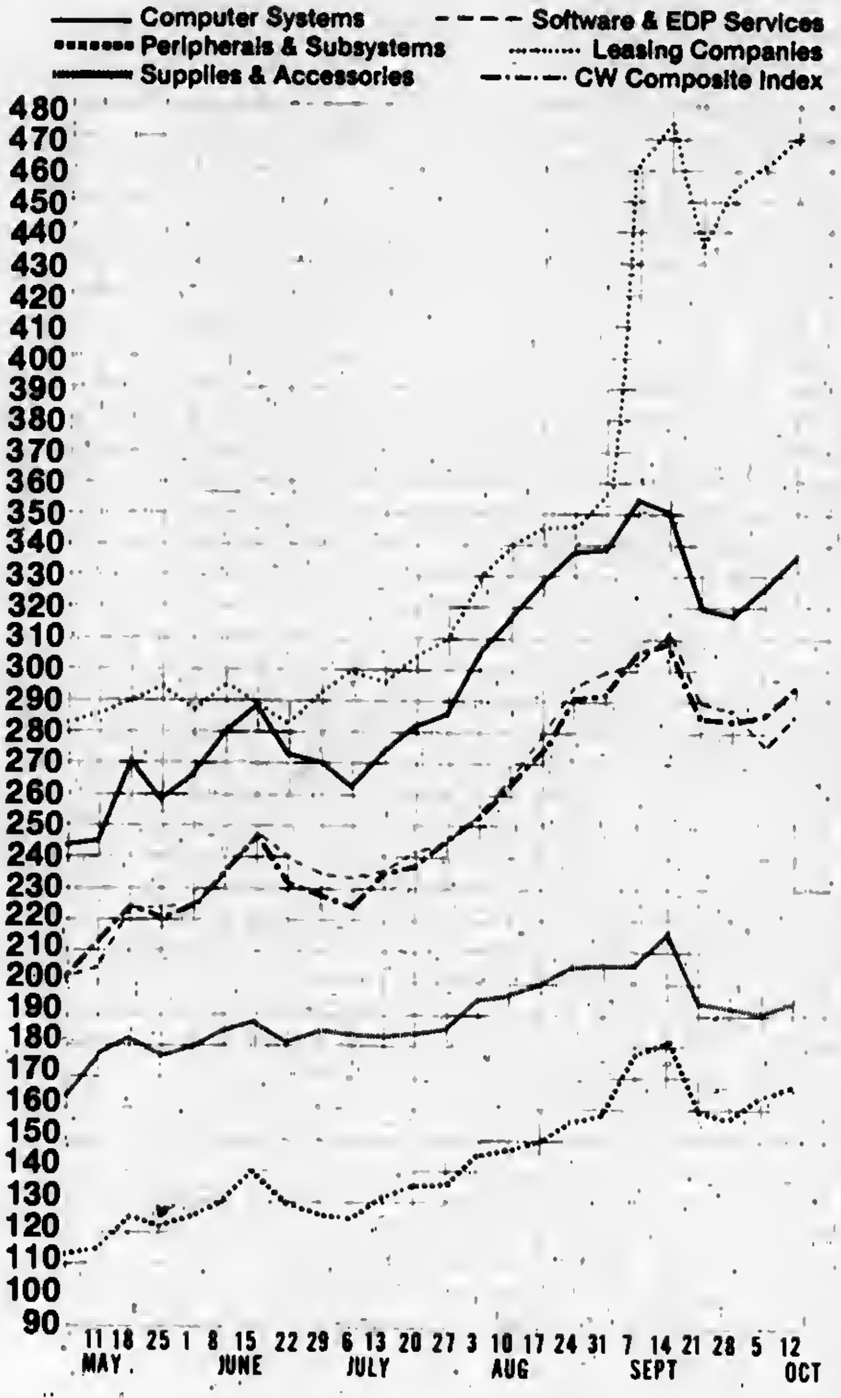

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	1876	1877
Shr Ernd	$1.54	$1.31
Revenue	217,837,000	164,168,000
Eernings	19,666,000	16,428,000
3 Mo Shr	.44	.37
Revenue	61,774,000	46,686,000
Earnings	5,674,000	4,656,000

MODULAR COMPUTER SYSTEMS
Three Months Ended June 30

	1878	1977
Shr Ernd	$.34	$.16
Revenue	15,773,000	13,628,000
Olec Op Lose	.....	145,000
Earnings	1,215,000	512,000
6 Mo Shr	.66	.28
Revenue	30,482,00	25,860,000
Diec Op Loss	.....	170,000
Eernings	2,354,000	855,000

a-Resteted.

TALLY
Three Months Ended July 2

	1878	1977
Shr Ernd	$.13	$.28
Revenue	8,968,000	e7,803,000
Tax Cred	.....	347,000
Earninge	366,000	606,000
6 Mo Shr	.30	.50
Revenue	17,253,000	e14,236,000
Tax Cred	.....	529,000
Eerninge	826,000	1,378,000

e-Resteted.

TELENET
Three Monthe Ended June 30

	1878	1877
Revenue	$2,168,000	$888,000
Loss	1,277,000	875,000
6 Mo Rev	3,648,000	1,581,000
Loss	2,384,000	1,835,000

TELEX
Three Months Ended June 30

	1978	1977
Shr Ernd	$.20	$.14
Revenue	31,683,000	22,026,000
Tax Cred	60,000	951,000
Earnings	2,201,000	1,555,000

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 11, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 11 1978	WEEK NET CHNGE	WEEK PCT CNNGE
A	AMOAHL CORP	28- 69	56 3/4	+5 1/8	+9.9
N	BURROUGNS CORP	59- 87	77 1/4	+1	+1.3
O	COMPUTER AUTOMATION	23- 44	27 3/4	-3 1/2	-11.1
N	CONTPOL OATA CORP	23- 44	39 1/4	+1	+2.6
O	CPAY RESEARCN INC	21- 74	67	0	0.0
N	OATA GENERAL CORP	42- 71	63 3/8	+3 5/8	+6.0
N	OATAPOINT CORP	34- 75	69 1/4	+4 5/8	+7.1
N	OIGITAL EQUIPMENT	39- 54	52 1/4	+3 5/8	+7.4
N	ELECTRONIC ASSOC.	2- 13	9 3/4	- 1/2	-4.8
A	ELECTRONIC ENGINEER.	11- 19	14	- 5/8	-4.2
O	FOUR-PHASE SYSTEMS	19- 46	38 5/8	+ 5/8	+1.6
N	FOXBORO	28- 40	36	-1 1/4	-3.3
O	GENEPAL AUTOMATION	7- 26	21 1/4	+3 3/4	+21.4
O	GRI COMPUTER CORP	1- 3	2 3/8	- 1/8	-5.0
N	HEWLETT-PACKARO CO	62- 93	88 3/4	+1 1/8	+1.2
N	HONEYWELL INC	43- 72	70 3/8	+4 1/2	+6.8
N	IBM	236-305	290 1/2	+8 1/2	+3.0
O	MAMAGEMENT ASSIST	9- 29	23 1/2	+ 1/4	+1.0
O	MICPODATA CORP	10- 23	20 1/2	+2 5/8	+14.6
O	MINI-COMPUTER SYST	5- 8	7 1/4	- 1/4	-3.3
O	MOOULAR COMPUTER SYS	7- 17	13 3/4	-1	-6.7
N	NCR	37- 67	67 3/8	+5 7/8	+9.5
M	PRIME COMPUTER INC	20- 43	37 1/4	+1 1/8	+3.1
N	PERKIN-ELMEP	17- 28	28	+1	+3.7
N	PAYTHEON CO	29- 58	51 1/2	+3 3/4	+7.8
N	SPERPY PANO	33- 49	46 1/8	+2 1/2	+5.7
A	SYSTEMS ENG. LABS	11- 24	17 1/2	+ 1/2	+2.9
A	WANG LABS.	12- 32	27 1/2	+ 3/4	+2.8

LEASING COMPANIES

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 11 1978	WEEK NET CHNGE	WEEK PCT CNNGE
O	BOOTHE COURIER CORP	13- 21	21	+ 1/2	+2.4
O	COMOISCO INC	5- 21	20 3/4	+1 1/2	+7.7
A	COMMERCE GROUP CORP	1- 1	5/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	4 7/8	+ 1/8	+2.6
M	OATRONIC RENTAL	1- 3	2 1/2	0	0.0
A	DCL INC	3- 5	4 1/8	+ 1/8	+3.1
N	DPF INC	8- 14	13 3/8	+ 3/4	+5.9
N	ITEL	16- 36	33 1/2	+1	+3.0
N	LEASCO CORP	24- 36	31 3/4	- 1/4	-0.7
O	LEASPAC COPP	1- 4	2 1/2	0	0.0
A	PIONEEP TEX CORP	4- 7	4 7/8	+ 1/8	+2.6
N	U.S. LEASING	13- 20	17 3/4	- 1/8	-0.6

EXCH: N=NEW YORK; A=AMERICAN; P=PNIL-BALT-WASN
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES APE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EOP SERVICES

EXCN		PRICE 1978 PANGE (1)	CLOSE OCT 11 1978	WEEK NET CHNGE	WEEK PCT CNNGE
O	ADVANCEO COMP TECN	1- 2	1 3/8	0	0.0
O	AMACOMP INC	8- 22	15 3/4	- 1/4	-1.5
A	APPLIEO OATA RES.	8- 17	14	- 1/8	-0.8
M	AUTOMATIC OATA PROC	24- 36	33	+ 1/4	+0.7
O	COLEMAN AMERICAN COS	1- 2	1 1/2	0	0.0
O	COMPU-SERV NETWOPK	7- 12	9	+ 1/2	+5.8
O	COMPUTER HORIZONS	1- 9	7 1/2	+ 3/4	+11.1
O	COMPUTEP NETWOPK	6- 16	12 1/4	+ 1/2	+4.2
N	COMPUTER SCIENCES	8- 17	15 1/4	+1 3/8	+9.9
O	COMPUTER TASK GROUP	1- 4	3 3/4	+ 1/2	+15.3
O	COMPUTER USAGE	2- 4	3 5/8	- 1/8	-3.3
O	CONSHARE	6- 19	18	+1 3/4	+10.7
O	OATA OIMENSIONS INC	4- 9	7 5/8	+ 1/4	+3.3
O	OATATAB	1- 2	1 1/4	- 1/4	-16.6
M	ELECTRONIC OATA SYS.	15- 25	22 3/8	+1	+4.6
O	INSYTE COPP	1- 3	1 3/4	+ 1/8	+7.6
O	IPS COMPUTEP MAPKET.	2- 3	3 1/4	+ 1/4	+8.3
O	KEANE ASSOCIATES	3- 6	5 1/4	- 1/8	-2.3
O	KEYDATA CORP	1- 3	2 1/4	+ 1/8	+5.8
A	LOGICOM	11- 19	15 1/2	+ 1/4	+1.6
A	MANAGEMENT OATA	1- 1	1/8	0	0.0
A	NATIONAL CSS INC	15- 36	29	- 3/8	-1.2
O	NATIONAL OATA CORP	7- 13	11 1/4	+ 3/8	+3.4
A	ON LINE SYSTEMS INC	17- 30	25 5/8	- 3/8	-1.4
N	PLANNING RESEARCN	4- 10	9	+ 1/8	+1.4
O	PROGRAMMING & SYS	1- 1	1 1/2	0	0.0
O	RAPIOATA INC	3- 7	6	0	0.0
O	REYNOLOS & REYNOLO	18- 36	29 1/2	+ 1/2	+1.7
O	SCIENTIFIC COMPUTEPS	3- 9	9	+1	+12.5
O	TYMSHARE INC	18- 33	29	+1 1/8	+4.0
A	UPS SYSTEMS	5- 8	7 5/8	+ 3/8	+5.1
N	WYLY CORP	1- 7	6 1/4	+ 1/8	+2.0

PEPIPHEPALS & SUBSYSTEMS

EXCN		PRICE 1978 PANGE (1)	CLOSE OCT 11 1978	WEEK NET CHNGE	WEEK PCT CNNGE
N	ADDRESSOGPAPH-MULT	14- 32	28 3/8	+ 1/8	+0.4
O	ADVANCEO MEMORY SYS	7- 18	16 3/4	- 3/8	-2.1
N	AMPEX COPP	10- 19	16 3/4	- 1/4	-1.4
O	ANDEPSON JACOBSON	5- 10	7 1/4	- 1/4	-3.3
N	APPLIEO OIG OATA SYS	13- 22	14 1/8	- 3/4	-5.0
O	BEEHIVE INT'L	4- 7	6 3/8	+ 1/2	+8.5
A	BOLT.BERANEK & NEW	6- 14	12 1/2	- 5/8	-4.7
N	BUNKER-RAMO	10- 20	18 5/8	0	0.0
A	CALCOMP	3- 13	10 7/8	- 1/8	-1.1
O	CAMBRIOGE MEMORIES	3- 9	6 5/8	+ 3/8	+6.0
N	CENTRONICS OATA COMP	16- 37	34	-2 1/4	-6.2
O	COGNITRONICS	1- 4	2 1/4	+ 1/4	+12.5
O	COMPUTER COMMUN.	6- 12	9 5/8	- 5/8	-6.0
O	COMPUTER CONSOLES	4- 10	8 3/4	+ 1/4	+2.9
A	COMPUTER EOUIPMENT	3- 6	5 3/4	+ 1/2	+9.5
O	COMPUTER TPANSCEIVER	1- 3	3 3/8	0	0.0
O	COMTEN	9- 38	34 5/4	+1 3/4	+5.3
N	CONRAC COPP	19- 26	22	+ 1/2	+2.3

EXCH		PRICE 1978 PANGE (1)	CLOSE OCT 11 1978	WEEK NET CHNGE	WEEK PCT CHMGE
O	OATA ACCESS SYSTEMS	3- 14	11 1/2	- 1/2	-4.1
O	OATA 100	9- 20	19 1/4	0	0.0
A	OATA PPOOUCTS CORP	15- 25	20 1/2	0	0.0
O	DATUM INC	2- 6	4 3/4	+ 1/8	+2.7
O	DECISION OATA COMPUT	2- 6	4 5/8	- 1/8	-2.6
O	OELTA OATA SYSTEMS	1- 1	5/8	- 1/8	-16.6
A	OOCUMATION INC	6- 34	30	+2	+7.1
O	OATAPAM COPP	6- 32	31 3/4	+3 1/2	+12.3
M	ELECTPONIC M & M	4- 9	7 1/2	+ 3/8	+5.2
O	FABPI-TEK	1- 2	1 3/6	+ 1/8	+9.5
O	GENEPAL COMPUTEP SYS	1- 3	2 3/8	+ 1/8	+5.5
N	HAZELTIME CORP	10- 17	15 5/8	-1 1/8	-6.7
N	HARRIS CORP	17- 36	35 3/4	+ 5/8	+1.7
O	IMFOREX INC	6- 11	9 3/8	- 1/2	-5.0
O	INFOPMATION INTL INC	8- 12	9 1/2	+ 1/4	+2.7
O	INTEL CORP	39- 62	56 1/2	+1 1/2	+2.7
A	LUNDY ELECTPONICS	4- 8	7	- 1/2	-6.6
O	MSI OATA COPP	12- 19	14 3/8	+ 5/8	+4.5
N	MEMOREX	27- 59	51	+2 1/4	+4.6
M	MOHAWK OATA SCI	6- 15	12 5/8	+1 1/2	+13.4
O	OMEX	2- 6	6	+ 1/2	+9.0
O	PENRIL CORP	5- 12	12 3/4	+1	+8.5
N	PERTEC CORP	9- 17	15 3/4	+ 5/8	+4.1
A	POTTER INSTPUMENT	2- 2	1 3/4	0	0.0
O	OUANTOR COPP	2- 5	2 1/2	0	0.0
O	RECOGNITION EOUIP	7- 13	11 1/4	+ 5/8	+5.8
O	SCAN DATA	1- 5	2 7/8	+ 1/8	+6.9
M	STORAGE TECHNOLOGY	19- 46	33 1/4	+ 1/2	+1.5
O	T BAR INC	11- 20	19 3/4	+2	+11.2
O	TALLY CORP.	4- 9	7 5/8	+ 1/8	+1.6
A	TEC INC	6- 13	10 5/8	+ 1/8	+1.1
N	TEKTPONIX INC	33- 50	47 7/8	+ 5/8	+1.3
N	TELEX	3- 9	7 7/8	+ 3/8	+5.0
O	TESDATA SYSTEMS CP	13- 23	14 1/2	-1	-6.4
O	WILTEK INC	1- 1	1 5/8	+ 1/4	+18.1

SUPPLIES & ACCESSORIES

EXCH		PRICE 1978 PANGE (1)	CLOSE OCT 11 1978	WEEK NET CHNGE	WEEK PCT CHMGE
A	AMERICAN BUS PROOS	6- 11	9 1/4	- 1/8	-1.3
O	BALTIMORE BUS FORMS	2- 5	1 3/4	- 1/4	-12.5
A	BAPRY WRIGHT	14- 30	28	- 1/2	-1.7
O	CYBEPMATICS INC	1- 1	1	0	0.0
O	DUPLEX PROOUCTS INC	18- 30	25 7/8	+ 1/8	+0.4
N	ENNIS BUS. FORMS	8- 17	14 1/2	+1	+7.4
N	3M COMPANY	43- 66	62 1/8	+3 1/2	+5.9
C	MOORE CORP LTD	26- 34	31 1/2	+ 3/4	+2.4
N	NASHUA COPP	18- 37	30 3/4	+3 1/8	+11.3
O	STANOARO REGISTEP	20- 27	27	+2	+8.0
A	TAB PROOUCTS CO	8- 16	14 1/8	- 1/8	-0.8
N	UAPCO	19- 28	27 1/2	+ 7/8	+3.2
A	WABASH MAGNETICS	10- 22	19 7/8	- 1/8	-0.6
N	WALLACE BUS FORMS	18- 33	27 3/8	- 3/8	-1.3

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NEWSPAPER

CW Photo by A. Dooley

Diane Ries demonstrates IBM's recently introduced 8100, which drew large crowds at Info '78 in Chicago last week. Conference coverage continues inside.

IBM Admits Moving Toward Independence Of Operating Divisions

By E. Drake Lundell Jr.
CW Staff

ARMONK, N.Y. – For the first time, IBM last week confirmed it is taking steps to make its operating divisions more independent – and, therefore, probably more competitive.

While the firm said it had decided not to set off separate subsidiaries "at this time," it admitted it "intends to continue to take steps to make its business units more self-sufficient."

It has been predicted [CW, Oct. 16] that IBM is moving toward becoming a General Motors-type of corporation in which the major company essentially operates as a holding company for separate but competing operating divisions.

In making the divisions more self-sufficient, an IBM spokesman said, the firm plans to give the divisions "more latitude" in developing and providing products, services and support.

The divisions also will be given more autonomy in product acquisition and will be allowed to make products they were previously required to purchase from other IBM units, he indicated.

IBM has been moving to this type of structure for some time. The recent announcement of the 8100 computer system [CW, Oct. 9] showed the firm had allowed its Data Processing Division (DPD) to enter what had formerly been the preserve of the General Systems Division (GSD).

At the same time, the firm allowed DPD to move into the domain of the Office Products Division (OPD) with the announcement of the 3730 office communications system.

Meanwhile, GSD is expected to enlarge its computer line to become more competitive with DPD. The internally code-named "Pacific" series of computers from GSD will range from the size of the System/3 up to systems with the power of a 370/158 when it is announced in the next few weeks, sources indicated.

The "GM" organizational strategy is a method of getting more revenues for the firm, industry analysts said.

Just as GM doesn't really care whether Pontiac or Chevrolet gets an order as long as it does not go to Ford, IBM will not care whether an order goes to DPD or GSD as long as it does not go to Honeywell, Univac or Amdahl, according to Robert Fertig, vice-president of the Technology Analysis Group at Advanced Computer Techniques Corp.

By having its operating divisions in direct competition, IBM apparently

(Continued on Page 4)

Acquire Business Skills, DP Managers Admonished

By Marcia Blumenthal
CW Staff

CHICAGO – Information managers are facing a crossroad in their careers; to avoid a dead end route full of ruts, they must gain the confidence of top management by acquiring sound business skills.

That was the advice given at the keynote session of the Information Management Exposition & Conference (Info '78) here last week.

To sit comfortably ensconced in the DP environment and let computer problems take precedence over business problems won't impress top management, keynoter William J. Mueller, vice-chairman of Arthur Andersen & Co., of Chicago, warned.

Instead, the DP manager must break with the past and become a catalyst, stirring action that will make those in the executive suite sit up and listen, Mueller stressed. By acting as a catalyst, the information manager will enhance his status within the organization.

One strategy for achieving status, Mueller maintained, is to provide training and management education. This training should not just be for the DP manager's own staff, but should encompass DP users and potential users within the organization.

By setting up training and education sessions in which operational person-

(Continued on Page 6)

Congress Passes EFT Bill, Protects Consumer Privacy

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. – Legislation providing consumer electronic funds transfer (EFT) protection and personal financial records privacy was passed last week in the hectic final hours of the 95th Congress.

The Fair Fund Transfer Act and Right To Financial Privacy Act are part of a comprehensive financial institutions reform bill approved by Congress in its marathon, 33-hour last day session.

The legislation, entitled The Financial Institutions Regulatory Act, provides consumer safeguards for commercial EFT systems and limits access to financial records by federal authorities without due process of law.

Congressional approval of the legislation came as a surprise to many observers here. Until the final day of this session of Congress, it seemed there was little chance for passage of any EFT or financial records privacy legislation.

According to a House Banking Committee staff member, there was just too much work left on bills covering those topics and not enough time to do it as Congress raced toward adjournment so its members could go home to campaign for reelection.

But at the last minute the provisions, part of several pieces of legislation on banking, were tacked onto a bill governing the interest rates financial institutions can offer their savings and checking account customers.

At 2:30 A.M. Sunday morning, Oct. 15, the omnibus banking legislation

(Continued on Page 8)

IN DEPTH
IN DEPTH

"Why APL?" Because, for one thing, it can increase programmer productivity 300% to 500%, according to Robert E. Cook and Allen J. Rose. See this week's In Depth following Page 54.

Amdahl Adds Biggest CPU Offering IBM Compatibility

By E. Drake Lundell Jr.
CW Staff

SUNNYVALE, Calif. – Amdahl Corp. upgraded its mainframe line last week with the introduction of the most powerful system to date that is compatible with IBM software.

At the same time, the firm announced an upgrade for its 470V/5, the 470V/5-II to bolster its lower level offerings.

The upper end machine – the 470V/8 – operates 20% to 30% faster in an interactive, high supervisor state environment than the 470V/7, the previous Amdahl top-of-the-line CPU, the firm said. It is almost 1.5 times as powerful as an IBM 3033 processor in a single CPU configuration, according to figures developed by *Computerworld.*

Major contributors to this performance increase are improved internal cycle time, a doubling in the size of the machine's high-speed buffer and the use of prefetching techniques in the buffer, Amdahl said.

The machine cycle time has been reduced to 26 nsec from 29 nsec on the V/7, the company noted. The buffer size for the V/8 has been raised to 64K bytes, compared with 32K bytes on the V/7 and on the firm's V/6-II and V/5-II.

The buffers operate in a two-cycle mode for a fetch time of 52 nsec on the V/8, the firm said. It added, however, that the buffer can be pipelined so each cycle is used for either a request for information or a return of information.

(Continued on Page 6)

COMPUTERWORLD
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Analyzed Decision Process

Nobel Winner Cited for DP Models

By Marcy Rosenberg
CW Staff

PITTSBURGH, Pa. — Dr. Herbert A. Simon, who was awarded this year's Nobel Prize in economics, earned his $165,000 prize for computer-based research in corporate decision making.

Simon, a professor of computer science and psychology at Carnegie-Mellon University here, used computers to simulate the ways people, especially those in large, complex business organizations, make decisions and solve problems.

"For example," Simon explained in a telephone interview last week, "we've studied the steps a trust officer might use to make decisions and tried to model his behavior on a computer to come up with certain rules of thumb."

Contrary to the economic theory that says a businessman sits in his office and has all the information he needs to decide how to be most profitable, Simon believes many executive decisions have to be made under uncertain conditions.

"Economics," he maintained, "has been kind of helpless in dealing with problems of uncertainty — that is, when alternate modes of action aren't known in advance and have to be discovered."

Long-Term Goal

His long-term research goal is to understand how decisions are made and what the psychological limits are, as a framework for developing ways to improve corporate decision-making.

Spanning many fields outside economics, Simon's experience includes work in business administration, applied mathematics, statistics, science theory and operations analysis. He cited past operations research work aimed at "building decision rules for inventory and production smoothing."

He received a doctorate in political science from the University of Chicago in 1943 and since 1965 has been a professor at Carnegie-Mellon, where he teaches an artificial intelligence course in the computer science department.

Discounts Fears of Depersonalization

Computers first interested him as a tool for simulating human behavior, Simon noted, discounting "as mostly nonsense" the fears that as computers take over more human functions, society will become less personalized.

"What computers do in industry," he said, "are the routine and repetitive functions that do tend to dehumanize people, leaving individuals with more time for activities that involve greater human interaction."

Simon plans to expand his psychological research work with computers to investigate the characteristic differences between experts and novices in such areas as physics and chess playing. "We are studying some of these differences to find out what makes an expert and how you get there from being a novice."

It would appear Simon already knows how to get there, although he was "astonished" to learn that he won the Nobel Prize. "A friend of mine who is a newspaper man in Stockholm phoned me before I got official word of the award and I thought it was a bit unbelievable."

Asked if friends treat him differently now that he has become an overnight celebrity, the Nobel recipient answered simply, "I hope not. Besides, they know me too well to take me seriously."

School Owner Guilty of Fraud

DETROIT — The owner of a computer training school here has been found guilty on four counts of fraud involving false claims for government funds under the Basic Educational Opportunity Grant [CW, May 29].

Harry M. Borcherding, owner of the Institute of Computer Technology (ICT) in suburban Oak Park, was found guilty of the criminal charges in a jury trial last summer.

In civil action a year ago, ICT was found guilty of submitting false claims to the government in the amount of $389,103.

Last month a judgment was made on that finding, requiring $786,206, double the amount involved, to be repaid to the government.

In both cases, Borcherding's counsel has filed motions to set aside the court's findings. Rulings on those motions could be made within a month.

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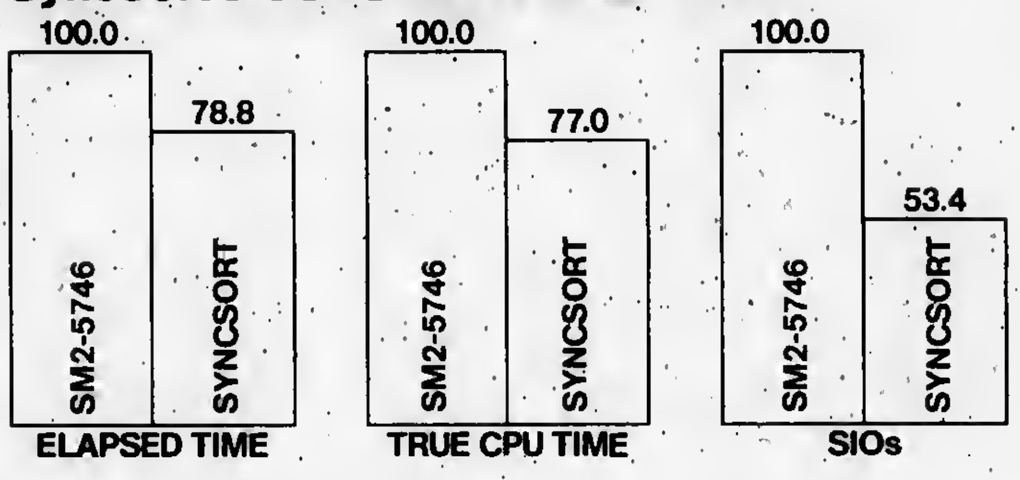

But performance aside—if that's possible in a software program—better ask yourself another question before you say "I do" to any DOS sort. How will it fit in if you move up to OS/VS?

Watch out if you try to make that journey with IBM sorting technology as a companion. Because the sad fact is that there is a "compatibility gap" between IBM's DOS and OS sorts. The features don't match!

SM2-5746, for example, has three called INCLUDE/OMIT, SUM and OUTREC. But no IBM OS sort has any one of those features.

So, if you try to migrate from DOS to OS, you may be upgrading your system, but at the same time you'll be downgrading your sort. And if you don't want to set aside a few months of your life for re-programming, then there's only one stark alternative: Divorce IBM and marry SyncSort!

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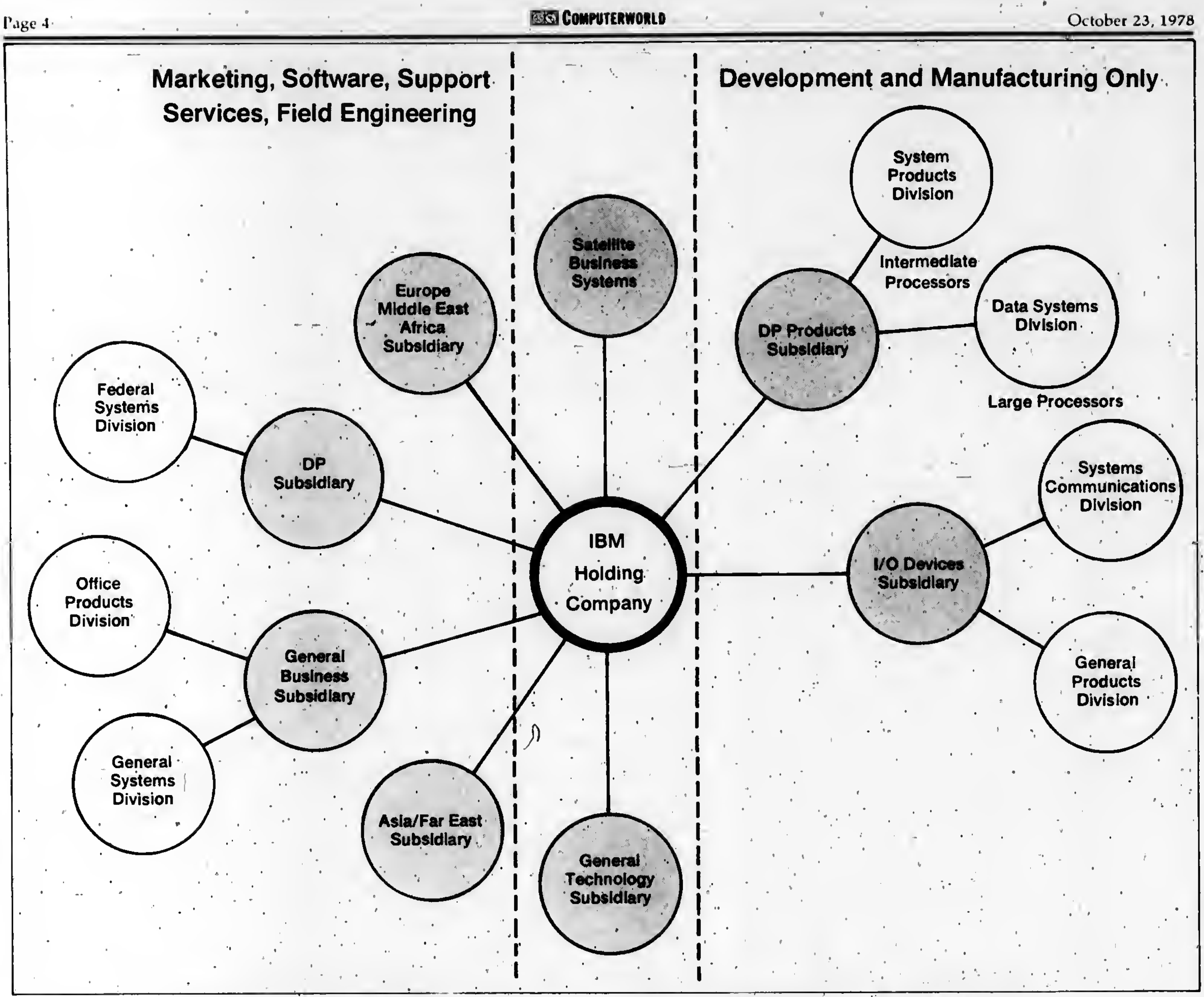


Possible Scenario of Future IBM Organization Based on Data Supplied by Advanced Computer Techniques Corp.

IBM: Holding Company With Core Subsidiaries?

By E. Drake Lundell Jr.
CW Staff

NEW YORK — While IBM said last week it does not plan to set up separate subsidiaries "at this time" (see Page 1), it is clearly moving in the direction of greater divisional autonomy:

But what will the corporation look like when this gradual shift is complete?

On a conceptual basis, IBM will probably become a holding company with about eight "core" subsidiaries (see chart above), Charles P. Lecht predicted last week.

Lecht, president of Advanced Computer Techniques Corp., called the IBM reorganization an "unfolding supernova" and said it will happen either "by revolution or evolution."

Under the conceptual plan, the core subsidiaries could be placed in three classifications: subsidiaries that develop and manufacture products, subsidiaries that market and supply software, services and support for products and subsidiaries that are either in separate fields (Satellite Business Systems) or that serve the entire company.

One the manufacturing and development side, the Data Processing Products subsidiary would have two divisions: the Systems Products Division for intermediate-range systems and the Data Systems Division for large processors. This structure is already in place although it is not a separate subsidiary.

Another subsidiary in this area would be the I/O Subsystems subsidiary, consisting of the present Systems Communications Division for terminals and a General Products Division for other peripherals.

In a radical departure from past practices, at some point these manufacturing and development divisions may market their products on an OEM or even end-user basis to firms not under the IBM holding company umbrella, Lecht forecast.

Of the marketing, support and services subsidiaries, the present Data Processing Division would become the Data Processing subsidiary, the largest in the organization. It is already in place with the Federal Systems Division as an arm.

The General Business subsidiary, also already in place to some extent, would include the Office Products Division and the General Systems Division (GSD). It is not clear at this time whether GSD would continue to develop and manufacture its own products or whether that responsibility would be lodged elsewhere, Lecht said.

The other two expected subsidiaries are already entities as the Asia/Far East Group and the Europe/Middle East/-Africa Group as part of the World Trade Corp. Instead of being Groups, these would also be spun off as subsidiaries, according to the scenario.

Satellite Business Systems, of which IBM is a 47.5% owner, will supply communications services and would be constituted as at present as a subsidiary.

The final major subsidiary would be General Technology, which would do basic research and supply components to the rest of the corporation as well.

At the same time, there would be other IBM subsidiary "fringe" areas that would not be the "core" areas of IBM business, such as the present Science Research Associates.

IBM Confirms Movement To Divisional Autonomy

(Continued from Page 1)

feels they will be more aggressive and problems of interdivisional cooperation will be reduced.

For example, in the past it was known that DPD salesmen resented having to work with GSD to configure distributed processing systems. IBM even had to change its compensation plan on such orders in order to placate the DPD sales group.

Now, with the 8100, DPD can go it alone in distributed applications, offering a complete system to users without having to use any GSD products. With the GSD Pacific announcements, that operating division will be able to offer a much wider range of computing options to users than in the past.

In addition, the separate subsidiary route opens up more management positions within the company as a whole and therefore more growth opportunities to management-level employees.

This might help IBM avoid situations like the middle managment exodus that it faced in the late 1960s, when a large number of managers left the firm when faced with dead-end career paths. Many left for jobs in the plug-compatible peripherals business, providing it with the management talent to attack the IBM base, the analysts noted.

IBM Booth Not Flashy One, But the 8100 Pulls 'Em In

By Howard A. Karten
CW Staff

CHICAGO — The IBM booth had no flashy displays or gimmicks to lure people in, but it nonetheless attracted a steady stream of visitors at the Information Management Exposition & Conference (Info '78) here last week. Potential customers and onlookers stood three and four deep, listening attentively as IBM sales representatives explained the 8100, on public display for the first time.

Buttonholed randomly, several people listening to IBM sell its wares seemed quite impressed with the recently announced system [CW, Oct. 9] and its possibilities — if reasonable delivery schedules could be obtained.

Michael Hepner, a programmer with the Air Force Systems Command at Wright-Patterson Air Force Base in Ohio, thought the display was "pretty impressive. We are looking at other systems for an acquisition management system, but this would be a good alternative to some we are studying.

"Our interest is in centralizing the data we work with to gain better control over it, while giving some DP power to the buyers," Hepner said. "A system like this would let buyers send summary information to us, freeing them to do the buying" and not the paperwork.

Diane Gade, equipment planning manager with the Hyland Division of Travenol Labs; Inc. of Costa Mesa, Calif., thought the system might be a good alternative for a remote processing system her company is studying: "We would be using distributed equipment for remote job entry and source data entry and possibly for some Cobol applications later down the line."

Three features of the 8100 were particularly attractive to Gade. "IBM is responsive to user requirements, the Cobol feature is certainly attractive and the ability to emulate 3270 equipment is a necessity," she said.

"This equipment looks pretty good for IBM customers," Eugene Starr of ESC Corp. in New Jersey said. "The only drawback I can think of is that the 8100 could deteriorate IBM's base of large users. But with IBM's service and support, I would think the system could be beneficial to most firms."

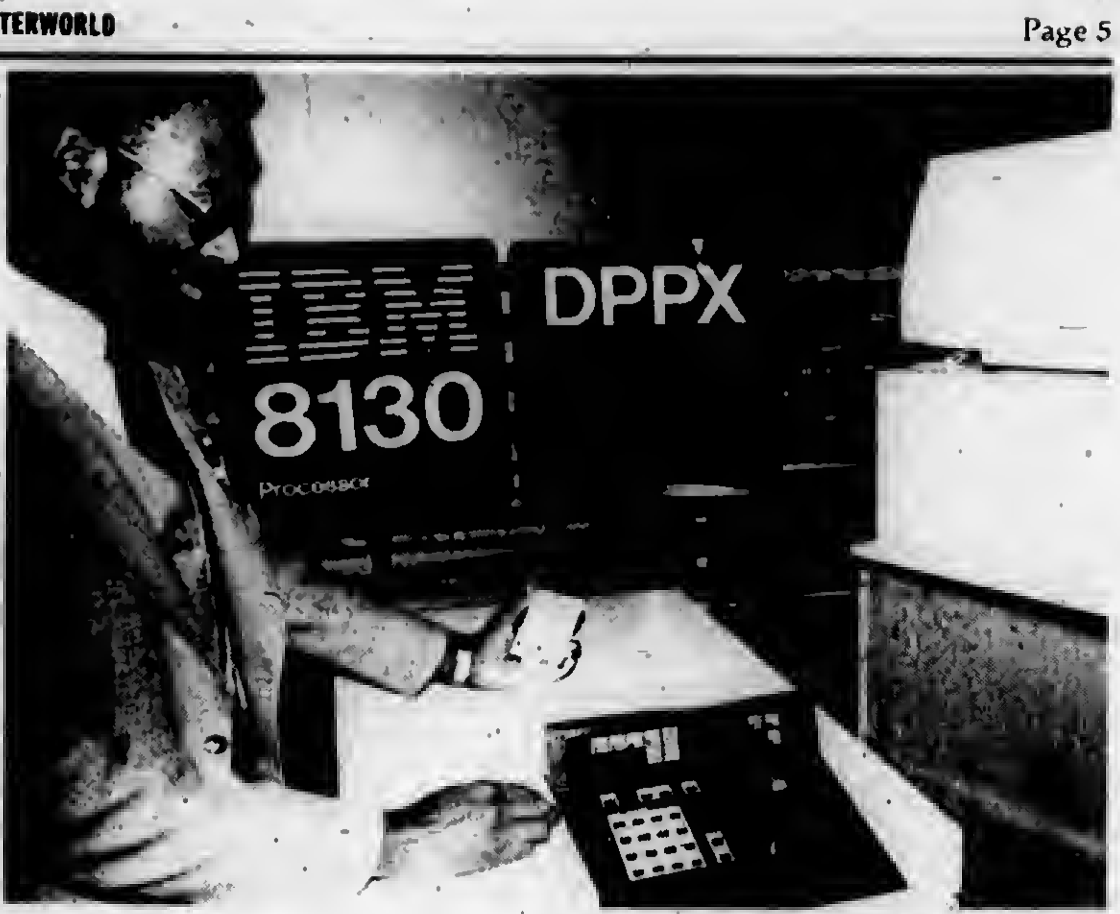
Ron Burquin of Abbott Labs in Chicago, for example, said Abbott is putting together a distributed order processing system and he is "fairly impressed with the system. IBM was out to give us an in-depth presentation, and it is a strong contender for the equipment we will select. The only problem is the delivery time — it will be tough to wait."

One of Burquin's colleagues at Abbott, Noel Tebo, said he, too, was impressed with the 8100: "Our [management information system] experts have given the system high marks."

One dissenting note was registered by "Joe from sunny southern California," who covered his name badge when informed that *Computerworld* was soliciting comments from passersby. Joe commented, somewhat dryly, that "IBM has at long last jumped on the bandwagon. In most cases, I think distributed DP is a buzzword — and a crock that people are interested in because they don't really know what it is and everyone's talking about it.

"I guess there are some good justifications for it, but in most cases that I have seen, it's basically mob psychology that's driving it."

CW at Info '78



James King displays IBM 8130 processor from behind roped-off area that was set up to prevent attendees from trying out the prototype system themselves. →

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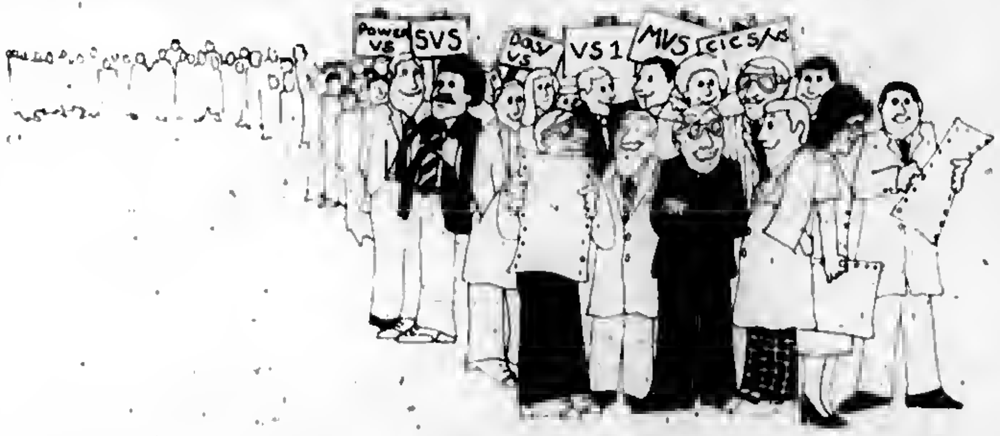

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Business Skills Now a Must

(Continued from Page 1)

nel can discuss their informational problems, the DP manager acts as a consultant.

In many cases, Mueller noted, informational problems have a systems implication and the information manager can suggest developing a system to solve the particular problem. The presence of top management at these sessions, however, is a critical ingredient.

Long-Range Plan

Another strategy information managers can use to convince management of their business acumen is to develop a long-rang systems plan that can be dovetailed to the firm's long-range business plan, Mueller said.

The long-range nature of this activity, Meuller believes, helps avoid system obsolescence when a system is finally installed after two years of planning."The information manager must integrate all systems in order to assess the impact of the one developed today on the one that is finally installed two years down the road," Mueller said.

He offered a six-point guide to DP managers for formulating long-range systems planning.

- The long-range planning project must be presided over by a steering committee consisting of top-level management. "Any long-range project requiring $3 million to implement is doomed unless you have top management involved," Mueller reasoned.
- The plan should be developed in conjunction with key users.
- Integrating the plan with the company's long-range business plans — three years to five years ahead — is critical.
- The information manager must make a candid assessment of the worth of present systems. "This is the most difficult task," Mueller said, "especially when you have just been telling everyone what a great system you have, when in effect it really isn't."
- After outlining major systems and projects that need to be developed over the next few years, the DP manager should then assign priorities to the projects.
- Finally, DP managers must estimate how much computer and communications capacity will be required to support the systems identified in the long-range plan.

'Blame the Manager' Syndrome

In addition to providing leadership in management education and systems planning, the information manager can cement his status within the company by scrutinizing the way DP projects are managed, according to Mueller.

Frankly, he said, the track record of managers in bringing projects in on schedule has been poor. And, whatever problems there may have been in this area in the past, Mueller observed, will get worse as systems projects get larger.

"Whenever projects have not gone well or when systems have had limitations, it has been construed as our failure, and our credibility with users and management has been damaged," Mueller maintained.

One reason for this may have been low time and money estimates. "Maybe we were afraid the project would not be approved if we told management how long we *really* thought it would take," Mueller admitted.

As information managers perform their catalyst role in the 1980s, they must make it their business not to lose touch with major project developments. Financial control and resource management are critical requirements, Mueller suggested, that will help managers with their role as catalysts.

For example, capacity planning based on daily utilization data, which is also projected into the future, allows the DP manager to warn management when new capacity is needed. At least one year's prior notice is needed, Mueller stressed.

The presence of multiusers and multisites within the organization makes this task difficult, but the information manager must deal with questions of daily efficiency.

Amdahl Tops Off CPU Line

(Continued from Page 1)

Logic has been built into the buffer to implement the prefetching technique. The logic predicts the next most logical consecutive data to be called into the buffer from main storage and then moves that data into the buffer, Amdahl said.

The buffer was also designed so frequently referenced data can reside in more than one area of the buffer for faster data access, the firm added.

Initial deliveries of the system are set for next September. A minimum configuration with 4M bytes of main memory and 12 channels will cost $3.28 million; a maximum configuration with 16M bytes of main storage and 16 channels will sell for $4.45 million.

The channels on the system can be used as either byte or block multiplexers, the firm said, noting channels can be switched from byte or block orientation at the console.

The V/5-II is basically a V/5 machine with a larger buffer — 32K bytes on the V/5-II compared with 16K on the V/5. The buffer operates in the two-cycle mode and has a fetch time of 65 nsec.

With the increased buffer size, the unit is said to be 10% faster than a basic V/5.

Upgrading in Field

Both the 470V/8 and 470V/5-II were designed for field upgrading with "no change in programming and minimal interruption of customer operations," Amdahl said.

The smallest Amdahl machine, the V/5, can be field upgraded to a V/5-II, a V/6 or a V/6-II, for example. An installed V/7 can be upgraded to a V/8.

Deliveries on the V/5-II will begin in January, Amdahl said. A CPU with 4M bytes of main memory and eight channels will run $2.1 million and a unit with 8M bytes and 16 channels will run $2.64 million.

All of the IBM 370 operating systems execute on the V/8 and the V/5-II; Amdahl supports MVS, VM/370, SVS, VS1 and MVT. The MVS/SE system control program also executes on the 470 line when Amdahl's MVS/SE Assist program product is installed.

A Textbook Writer's Dream

Mutual of Omaha's Career Paths Standardized

By Marcia Blumenthal
CW Staff

CHICAGO — The personnel evaluation methods used by Mutual of Omaha to rate its DP personnel would probably send shivers of ecstasy up the spines of textbooks writers who specialize in personnel management.

These writers, so enamoured of standardized rating forms, would thrill to the management by objectives (MBO) form, tremble over the skills profile schedule and pant at the sight of the performance evaluation form used by the Nebraska-based insurance firm.

While no swooning or panting was evident during a seminar on human resources management here last week at the Information Management Exposition & Conference (Info '78). The overflow crowd was eager to learn more about Mutual of Omaha's personnel techniques that form the basis of career development for its DP personnel.

No Career Ladder

Mutual of Omaha's program, to a great extent, is based on the work done by John L. Fairfield, a partner and head of the Administrative Services Division of Arthur Andersen & Co. of Chicago. Fairfield led off the seminar with a discussion of the problems DP personnel face in attempting to attain management slots within a firm.

While the professional press is bannering such headlines as "From DP Roots, Top Management Is Reachable," companies do not, as a rule, offer an organizational path to the executive ranks for DP technical staff, Fairfield pointed out. In fact, he declared, the training provided DP professionals by companies is suspect, rarely providing instruction on the skills a DP professional needs to attain management positions.

The DPer who wants to get ahead, Fairfield said, is levels below the management information systems vice-president. Furthermore, that person cannot leave a hot project to take training to fill a new position.

The company, meanwhile, has hired experienced personnel from outside the company to fill management slots. DP professionals within the company know the newly hired personnel is highly paid but often possess fewer skills than employees already within the firm.

Consequently, Fairfield claimed, DP professionals tend to identify with the specific tasks they are working on, rather than identifying with the company itself.

"No matter whose payroll I'm on, I'm really working for myself" is a prevalent attitude among DP professionals, Fairfield noted. "The DP discipline outstrips all others in raw turnover figures."

Moving from the general to the specific, Mutual of Omaha executives John E. Chestnut, assistant vice-president of computer systems and programming, and G. Ronald Ames, second vice-president of computer data services, rounded out the discussion of their company's program.

Today, DP employees at Mutual of Omaha are considered associates, sharing with their supervisors a partnership in career pathing, Ames noted.

The career progression program is formalized and standardized, Ames said, consisting of about five critical components. A planning chart is the road map of an employee's career progession.

This way employees know the range of time they will have to spend in a position prior to a promotion and how many hours of training are available for attaining skills that permit progression to the next position level. Employees may move laterally, taking on jobs with more technical duties, or they may move vertically, rising to supervisory levels, Ames explained.

The skill rating component of the progression consists of 15 skills employees must master to become eligible for advancement. These skills — not all of which are necessary for advancement — are scaled from one to six, with a rating of four considered normal capability.

The skill matrix, another part of the formal assessment program, shows the critical or "driver" skills necessary to attain promotable status. However, employees know in advance which key skills they must have in order to be promoted, and training is available to develop those skills, Ames noted.

Yearly appraisals of each DP employee are made using MBO techniques, Chestnut said. Displaying the forms used in the MBO process, Chestnut pointed out that the procedure is broken down into people-related and job-related factors.

The people-oriented objectives include determination of career objectives and assignment preference. The job-related MBO component consists of specific objectives to be attained on the job during the upcoming year as well as an analysis of accomplishments.

CW at Info '78

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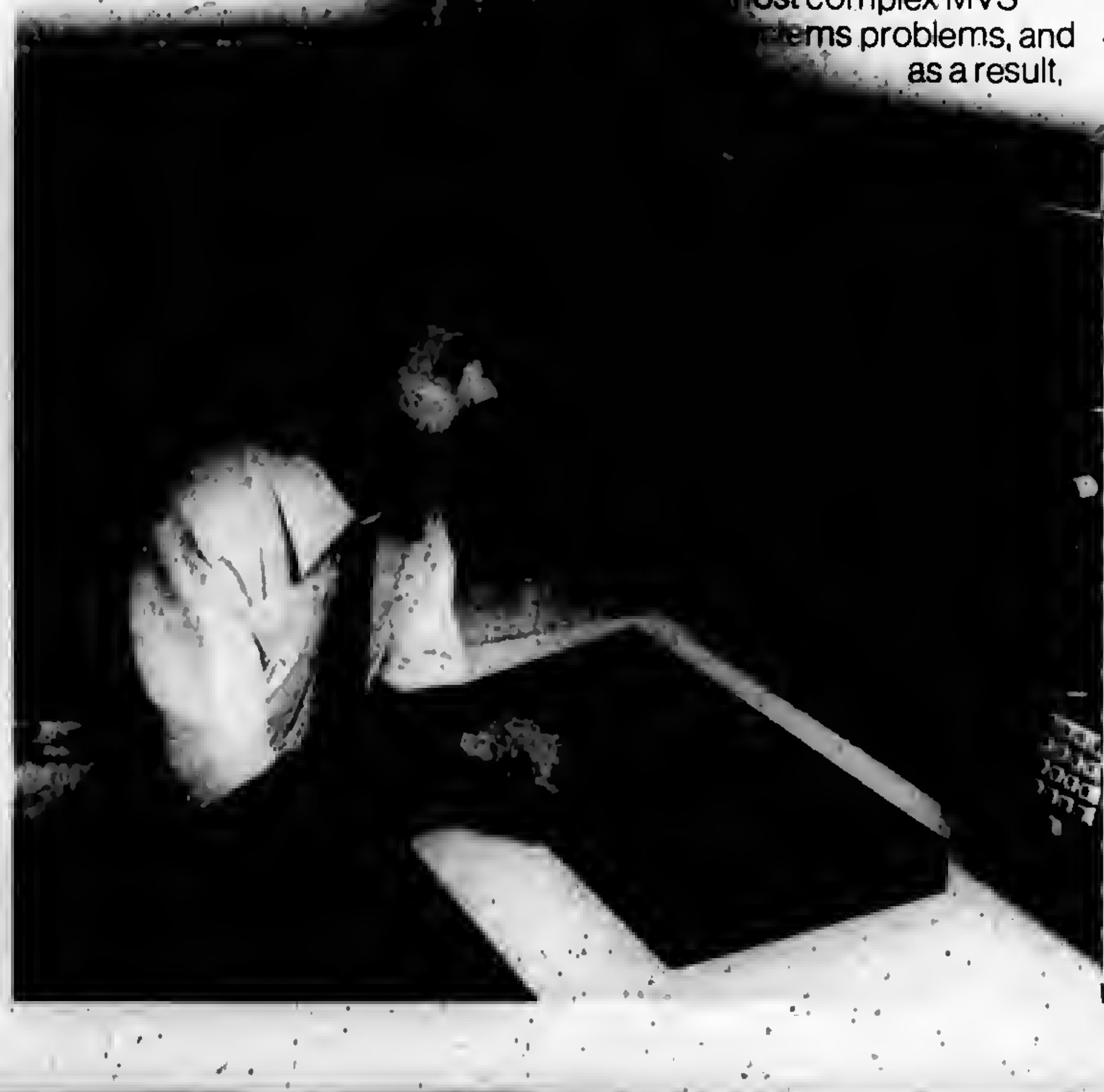

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EFT Bill Passed By Congress Protects Privacy

(Continued from Page 1)

was passed by the House of Representatives, which had been in nonstop session since early the previous morning. The bill was shepherded through by Rep. Fernand St. Germain (D - R.I.) on a vote of 341 to 32.

Senate Passes Bill

Four hours later, the bill, under the leadership of Sen. William Proxmire (D - Wis.), passed the Senate by voice vote. The bill now goes to President Carter to be signed into law.

There is no known organized opposition to the legislation, and it is thought the bill is in no danger of presidential veto. The president has 10 days following the bill's approval by Congress to sign it. However, a White House spokesman said no date has yet been set for signing.

EFT Portion

The EFT portion of the legislation, called The Fair Fund Transfer Act, is an amendment to the Consumer Credit Protection Act. It provides "A basic framework establishing the rights, liabilities and responsibilities of participants in electronic fund transfer systems."

The bill defines EFT as "any transfer of funds...which is initiated through an electronic terminal, telephone instrument or computer magnetic tape." This includes point-of-sale transfers, automated teller machine transactions, direct deposits or withdrawals of funds and transfers initiated by telephone.

Financial institutions — banks, savings and loan associations, credit unions and "any other person who, directly or indirectly, holds an account belonging to a consumer" — will have to notify consumers of the "terms and conditions" of EFT services.

Such terms and conditions must include a clear statement of consumer rights, responsibilities and liabilities, the institution's safeguards against error and abuse and methods of correction for its systems.

Financial institutions will also have to provide "written documentation" of all EFT transactions at the time they take place and provide a "periodic statement" of an individual's EFT transactions. Statements will have to be mailed monthly or, if the consumer has used the EFT services on less than a monthly basis, at least every three months.

Error Resolution

Detailing error resolution procedures, the bill says a consumer will have 60 days after receiving his periodic statement to notify the financial institution an error has been made. The institution will then have 10 days to investigate and respond to the consumer's notification, which can be done orally or through the mail.

The legislation says, "If the financial institution determines that an error did occur, it shall promptly, but in no event more than one business day after such determination, correct the error..."

The financial institutions can, however, take up to 45 days to investigate an error complaint if the consumer's account is immediately credited with the amount of money alleged to be in error.

If a financial institution fails to follow the prescribed error resolution procedures, a court may award the consumer treble damages, according to a provision in the bill.

The legislation would require a consumer to report loss of his EFT card or means of access to the EFT system within two days after discovering the loss. The consumer then could not be held liable for more than $50 lost through an unauthorized transaction.

In any case, a consumer's liability can never exceed $500, and the burden of proof is on the financial institution to show that any EFT transaction was authorized.

The Fair Fund Transfer Act goes into effect 18 months after the bill is signed into law, except for the provisions on consumer liability and a section governing the issuance of transaction cards, which take effect 90 days after enactment.

U.S. vs. Miller

The financial privacy portion of the Financial Institutions Regulatory Act is a congressional response to the Supreme Court decision in U.S. vs. Miller, which held that a customer of a financial institution has no standing under the Constitution to contest government access to his financial records.

Basically, the court decided such records are the property of the financial institution and the customer has no constitutional privacy rights regarding them.

The Right to Financial Privacy Act is the end result of several bills introduced in Congress over the last three years to deal with the issues raised in the Miller case. In addition, several bills calling for financial records privacy were introduced folowing the final report last year of the Privacy Protection Study Commission, which recommended greater personal privacy rights in this area.

The bill passed last week provides specific legal avenues of access federal authorities must follow to obtain an individual's records from a financial institution. It also specifies legal action an individual may take to stop his financial records from being turned over to the government.

Authorized Procedures

The procedures authorized for obtaining financial records are customer authorization, administrative subpoena, search warrants, judicial subpoena and formal written request.

The government must notify an individual that his financial records are being sought and advise him of his rights under the law to attempt to keep his records from the requesting agency.

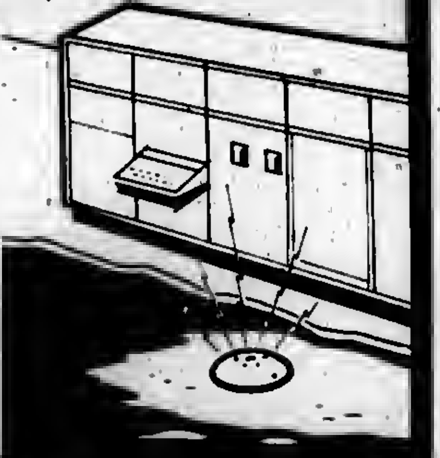
Within 10 days after receipt or 14 days from the mailing date of the mailing date of the subpoena, summons or formal written request, the individual would be able to file a motion in court to quash an administrative summons or judicial subpoena, or file an application to stop a government authority from obtaining the records through a written request.

Bill's Stipulation

An important section of the bill deals with the sharing of financial information obtained by the government. Records obtained by one agency cannot be "provided to any other government department or agency," according to the bill.

The legislation also contains a section stipulating that financial records obtained by a grand jury can only be used by the jury to decide whether to issue an indictment and to prosecute the crime for which the indictment is issued. The records must then be returned or destroyed by the grand jury and do not become a part of its records.

The Securities and Exchange Commission (SEC) was given a two-year exemption from the provisions of the bill, during which time the SEC will try to persuade Congress it should not be bound by the new legislation.



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Fancy Mini Not Always Best

Software Seen Making or Breaking System

By Tim Scannell
CW Staff

CHICAGO — Managers faced with the problem of choosing the best minicomputer system from an orchard of automated possibilities usually pick the shiniest apple and discover, too late, the inevitable worm.

A potential user's first thoughts when examining small business minicomputers should be directed beyond the neatly arranged panels and knobs of each machine to the system's software. According to Thomas McCarty, a partner with Arthur Anderson & Co., it is the software and its efficiency that will eventually determine the success or failure of a minicomputer installation.

McCarty expressed these views on minicomputers and software selection at the Information Management Exposition & Conference (Info '78) here last week at McCormick Place. He was one of more than 200 speakers and chairpersons who discussed, examined and offered advice on information management trends today and outlooks for the 1980s.

Software Selection

McCarty focused on the selection of application software rather than systems packages because, he said, the small business executive is more interested in processing a company's inventory than trying to understand the details of a minicomputer's operating system. However, operating systems should eventually be given some consideration, particularly since some software systems "may or may not be included in the price of the hardware."

There are basically two types of application software systems, McCarty said, the precoded packaged program and the heavily modified custom version.

Because of their virtual completeness, packaged programs offer several advantages to the "newborn" user. First, they shorten the development cycle — the time it takes to implement a minicomputer system. The precoded programs also relieve the manager of programming and debugging duties and eliminate the need for detailed design plan, McCarty explained.

Furthermore, packaged programs free the computer resources from the constraints of testing and allow production activities to continue. "By taking advantage of things already developed," McCarty noted, users are spared the trauma of "reinventing the wheel."

J. Steven Harrison, a treasurer with the Chicago-based Columbia Pipe & Supply Co., shared McCarty's disdain for "pioneering" a software system. "Software pioneering," Harrison said, "might get it for a little less money but it's not worth the aggravation."

Harrison outlined the transitional steps taken by his firm on the road from a manual to a computerized financial/inventory system.

Consultants, hired by the company at the onset, initially presented three alternatives to Columbia Pipe & Supply's president: stay manual; opt for a time-sharing or service bureau; or build an in-house computer system.

The in-house solution was selected, Harrison explained, because "We could see down the road that the other alternatives wouldn't provide relief."

The company eventually chose a Singer Co. on-line real-time computer system with eight CRTs, two printers and 8M bytes of storage, he said, but not without first learning a few lessons about DP and minicomputer acquisitions.

CW at Info '78

First of all, Harrison remarked, computer salesmen will do "anything to try to get their foot in the door." This includes lowering the price of the entire system by "skimping" on the hardware, which ultimately handicaps the user.

Vendors will also try to avoid "strict" installation schedules, fearing the contract will be canceled if the deadline isn't reached. Users should insist on specific dates of progress and completion.

Finally, as the system is being installed, the manager should try to put as many people as possible on the project so they can learn about the system from the ground up. Understanding just how the minicomputer fits together and what part each software and hardware piece plays is crucial to a successful transition, Harrison concluded.

Jim Freeman and Lou Zeller examine output from the California Computer Products, Inc. 1012 plotter at Info '78.

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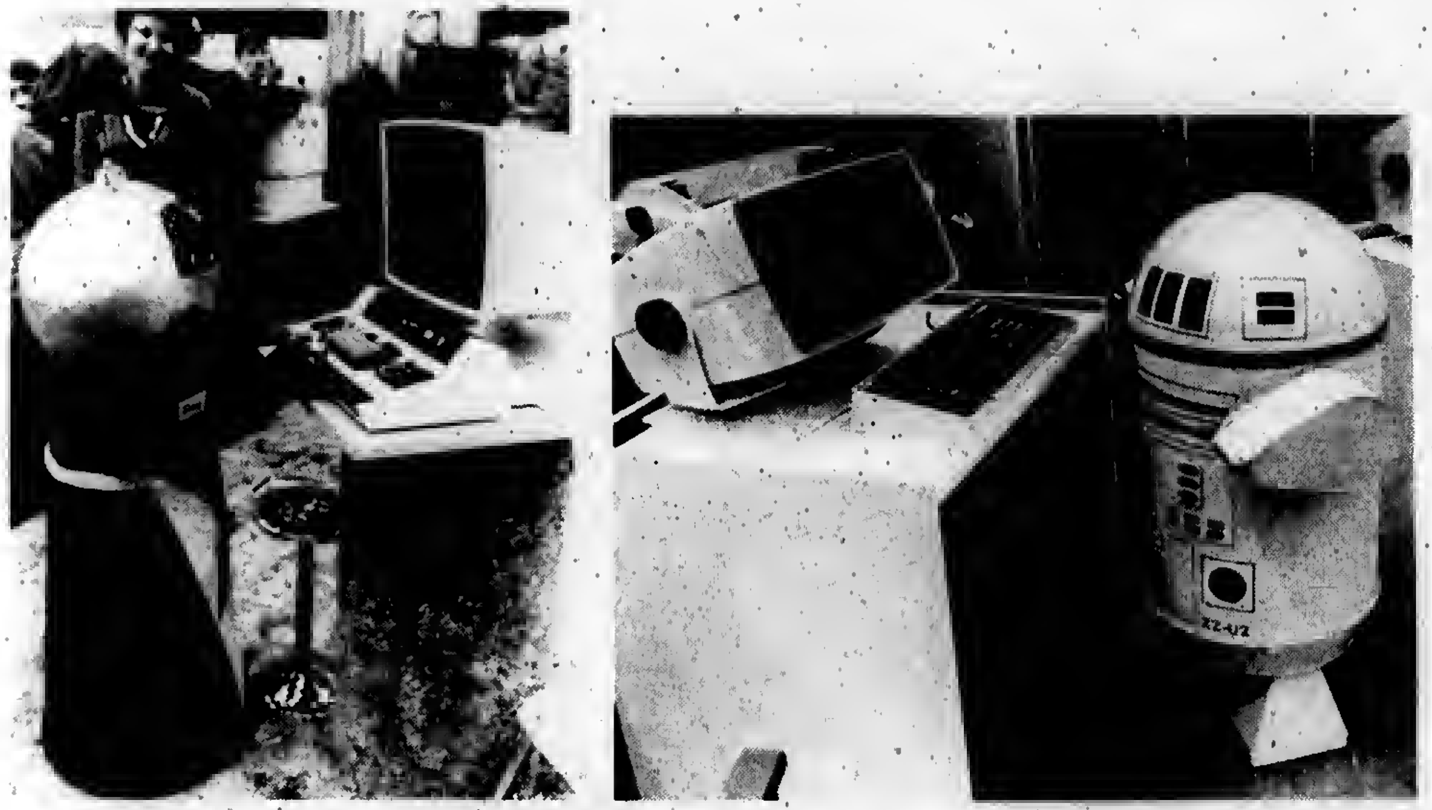
D.R. Curto watches as Russell Juleen tries a CRT on Qantel Corp.'s 1400 system.

Wang at Work



Cummins-Allison Corp.'s Orion and Future Systems, Inc.'s ZZ-U2 communicate with their "cousins," a Cummins-Allison Series 6400 and a Data General Corp. Dasher.

Bob Lieberman and Bob Brown examine Texas Instruments, Inc.'s Series 700.

Megadata Corp.'s 700 system beats out the Yellow Pages by letting fingers talk, not just walk.

Bob Radziewicz and John Furno stand back from the Teletype Corp. Model 4540.

John Ammon points out Wang Laboratories, Inc. word processor system to Carole Wald.

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Info '78

CW Photo Feature
by
Ann Dooley

It may save space, but that's ridiculous!

In keeping with few new products being shown on the floor, Management Science America, Inc. featured its standby card tricks — but the crowd still loves them.

Ken Upcraft asks Jerry Wilson about Compu-tone Systems, Inc. VIP Mode 600 system.

Racal-Milgo Corp. staffers discuss fine points of the System 185.

DDP Move Need Not Be Alarming, Users Told

By Howard A. Karten
CW Staff

CHICAGO – The growth of on-line systems and the reliability problems associated with running large mainframes have spurred the spread of minicomputers, according to Larry D. Woods, manager of distributed computing for John Deere & Co. of Illinois.

Speaking at a session on "Converting to Distributed Data Processing – Prerequisites, Planning and Control" at the Information Management Exposition Conference (Info '78), Woods cited several examples from his company's experience to illustrate his contentions that minicomputers and distributed DP (DDP) need not frighten or disrupt a user.

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Woods told an overflow audience that in his view, there is an important and significant difference between distributed and decentralized systems. This difference lies in the control of and responsibility for installing and implementing these systems. Typically, a distributed system is installed and overseen by a central management information systems (MIS) department within a company, whereas a decentralized system is installed by a user department and is only loosely controlled (if any at all) by the central MIS department, he explained.

Suggesting that the term "minicomputer" is "derogatory," Woods offered this definition of "minicomputer": a system that is not a mainframe, has not been installed by a [central] MIS department, is not understood by an MIS department and is proliferating.

He cited his own company's experience in this regard. Deere decided in early 1975 to take a census of its minicomputers and counted 35. A year later, that number was up to 102, and by early 1977, it had grown to 250. The latest count, taken earlier this year, showed the company had close to 300.

In addition, the firm is using 10 IBM 370/168s, two 158s and a 3032.

Illustrating his remarks on the virtues of minis, even for a company that relies heavily on mainframes, Woods said Deere uses a mini to poll some 1,500 teletypewriters through which the company collects data. The $250,000 mini has been performing that task without a single failure since April. By contrast, IBM's Tcam software previously used was cumbersome and often required close attention and lengthy debugging when changes in the polling data were necessary.

The explanation for this superior performance, Woods believes, lies in the difficulties posed by software, particularly when several pieces of software interact with each other and with the hardware. Such interactions are often unpredictable. Furthermore, as the size of a CPU and memory increase, more software is added to a system to take advantage of the system's power as well as achieve an economy of scale.

The implication of this, according to Woods, is obvious: The less software running at one time on a system, the better the reliability. And the answer to running less software at one time is a smaller system.

Another example cited by Woods pertained to the functional off-loading of some of the mainframe's work, for example, by putting some of the program development editing functions into a minicomputer, a programmer could continue to do at least some program development work even if the mainframe went down.

Broad View of Small Systems

Urging the attentive audience to take a broad view when thinking about the benefits to be derived from minis, Woods cited the experiences of two individuals at Deere.

In one case, a manager involved in sales and marketing obtained an Apple Computer, Inc. personal computer to help him work with salesmen and sales projections. He learned to program it himself, Woods said, and routinely used it when discussing sales quotas and targets.

In another case, an employee working in the warehousing area used a Radio Shack TRS-80 to simulate the handling and storage of goods. He planned to use the system to sell management on the feasibility of running it on a larger mainframe, Woods said.

The significance of these examples, Woods hinted, was threefold: The employees involved became enthusiastic about solving problems they had, the work performed was useful to the company and the projects probably would not have been undertaken at all if a mainframe – and the associated expense, funding, justification, etc. – had been required.

At another company described by Woods, management literally doesn't know where all the minicomputers are, since they are on wheels and can be moved about. The systems, which are used by various engineering departments, are moved from department to department as the users engage in horse-trading with one another, swapping various services such as programing for computer time.

Despite these examples of successful use of minis, Woods said potential converts should be sure to be aware of all the potential pitfalls.

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Small Business Managers Warned:

Don't Be Lulled Into False Security by Minis

By Marcia Blumenthal
CW Staff

CHICAGO — Managers who lose perspective of the basic functions of management — control and planning — after installing a small business system are leaving themselves open to a variety of pitfalls.

Experts participating in a panel discussion here last week on small business systems said some of the pitfalls include inaccurate information, fraud and the installation of unnecessary computer equipment.

The benefit of receiving instant information lulls managers into thinking their small business systems are performing optimally and require no control checks, according to Richard I. Hoberman, management advisory services supervisor for Seidman and Seidman in New York.

Loss of control is a serious enough sin, but when compounded with lack of planning for future DP needs, small business managers may suddenly find unneeded mainframes or minicomputers on their doorsteps, Daniel C. Zatyko, director of distributed processing at Basic Four Corp., warned.

Accuracy Problem

Hoberman and Zatyko shared the podium during a session at the Information Management Exposition & Conference (INFO '78). Hoberman, concentrating primarily on the control function, told managers not to take for granted the accuracy of the figures supplied by their systems.

The systems have limits, he explained. In transaction processing, for example, the data entry function is in the hands of the employee. "Moreover, when employees control data entry, there is a greater opportunity to hide mistakes and perpetrate fraud and embezzlement," he pointed out.

To help control the accuracy of information, Hoberman advised managers to institute controls over data input, processing and output and the physical environment of the DP area.

When inputting data, Hoberman suggested that operators be required to check the data being entered against the data before them prior to going on to the next transaction. At that time, operators should initial the input documents.

Manually running a total on an adding machine and checking it against the total the computer spits out is an effective means of verifying figures, Hoberman said.

Processing controls include giving each application a code name and each operator a code number. Output controls, Hoberman continued, require the creation of an authorized distribution list for each report and the prohibition of duplicate report runs without management's approval.

Physical environment safeguards include not only protection from fire and water damage, but also adequate insurance for the equipment and the proper bonding of people responsible for data to cover losses from embezzlement, Hoberman stressed.

Critical to the control process is the documentation, using a flowchart, of the entire system. "Inadequacies in the flowchart will stare you right in the face," Hoberman said, and show you where system weaknesses exist.

Besides ensuring the accuracy of data, avoiding opportunities for fraud should be a prime concern for managers whose firms use small business systems, Hoberman said.

Hoberman raised two red flag situations which may be indicators of potential fraud.

"Avoid the 'one-man DP shop' where one person is responsible for programming and operating the data entry and data control functions. A really smart guy can steal you blind, and your accountant may never find the error.

"Segregation of duties and redundancy of knowledge are musts," Hoberman asserted.

Another warning flag should be hoisted, Hoberman said, when the small business manager encounters the "helpful software vendor who installs an auto-answer modem on your mini system so he can troubleshoot your problems from his office." To control this, the business manager should be able to turn off the modem.

CW at Info '78

Once small business managers have established control procedures and are using their systems to near capacity, the temptation to purchase additional hardware presents yet another pitfall. An alternative to expanding the small business system within a relatively small firm, Zatyko suggested, is the use of the network service suppliment.

This option permits the small business system user to occasionally utilize a mainframe through a communications line to a service bureau.

"Your mini may be spending up to 80% of its time processing a job that could be done more efficiently on a mainframe," Zatyko noted.

A service bureau can serve as a cen-

(Continued on Page 14)

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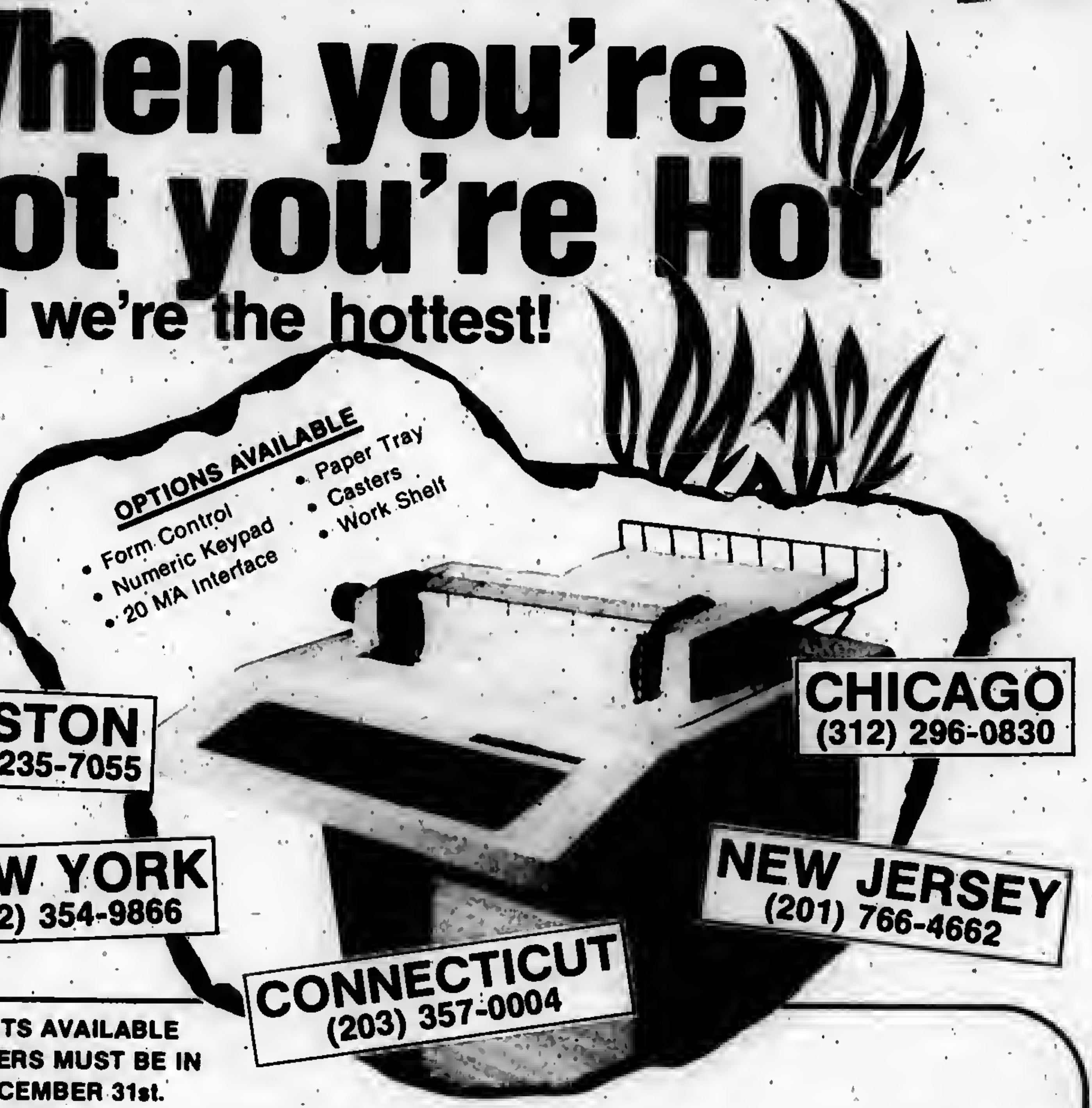

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Dictionary Seen Vital to Distributed Data Base

CW at Info '78

By Brad Schultz
CW Staff

CHICAGO – No distributed data base (DDB) scheme should lack a good data dictionary, a session on distributed data processing (DDP) at the Information Management Exposition & Conference (Info 78) was told here last week.

Dictionaries define the types of data contained in the DDB and provide a structure and set of rules for manipulating this data, according to Maurice Blackman of Arthur Anderson & Co., an accounting firm that markets data base services.

Dictionary definitions specify what data looks like when input, stored and edited; this determines what data is accessible to a user or is needed in a DDB-generated report, Blackman explained

Generally, dictionaries result in better documentation and facilitate any modification of the DDB, he continued, adding that without the consistency dictionaries demand, any DDB would degenerate into chaos.

In the State of Illinois Office of Management Information and Communication, DDB users conform to a dictionary because dictionaries help minimize data redundancy and generally hold users to their software objectives, according to Larry C. Melton, who is manager of professional services for that organization. Dictionaries will eventually be incorporated into the operating systems implemented in DDP networks, he said.

Melton also told the session that data base administrators (DBA) should not become involved in daily data base or communications problem-solving at the expense of planning and coordination functions. The DBA should have ultimate responsibility and authority over virtually all aspects of the DDB.

Important considerations in establishing a DDB include application needs, user needs, geographic locations of member facilities, frequency of use for each facility and security privacy requirements, Melton pointed out.

The DBA should have a staff background, he continued, noting that desirable experience would encompass application planning, development processing, project management and data base design.

Duties, Responsibilities

The responsibilities of a DBA include assisting and monitoring such activities as system testing, documentation, standards promulgation, design and assessment of backup/recovery capabilities, evaluation of resource price/-performance trade-offs and general resource allocation, Melton said.

In the area of documentation, Melton maintained, the DBA should review the full gamut of paperwork and literature, including plans, schedules, manuals, specifications documents, design documents and program documentation.

Melton noted that not every DDP environment warrants a data base management system (DBMS) and that a multikey sequential access method should be used where a DBMS is unnecessary.

The DDB in Illinois that Melton administers handles 175,000 transactions daily and regularly employs IBM's IMS as well as multikey sequential software. This arrangement has three levels of distribution: host CPUs, transaction processors (small computer systems with CRT terminals dedicated to queries, remote job entry and data entry functions) and functional processors generally devoted to data entry.

Don't Be Lulled by Mini, Business Managers Warned

(Continued from Page 13)

tralized data base. For example, Zatyko said, the University of Alabama's hospital outgrew its IBM 380/158 but, rather than replacing the system with a larger mainframe, downgraded to three minis purchased for $28,000 each. The minis were installed in three separate profit center departments — general medicine, surgery and obstetrics and gynecology — where summary data, especially demographics, originated and was sent to the data base at the service bureau. There the information was integrated with other hospital data such as admission information, which the profit centers didn't collect.

However, small business systems users attracted to network service supplements must evalnate not only the costs of service bureaus, but most also scrutinize the operating software of their installed systems.

In addition to bisynchronous communications protocols, the system's software should have the capability of handling sign-on cards and file management, Zatyko said.

IBM 2780 and 3780 emulation is also required. A caveat here is that, while many mini vendors offer 2780 and 3780 emulation, the utilities vary in ease of use. A small system user, Zatyko suggested, would want a CRT utility to avoid having to punch cards.

Night-time use of Wats lines provides savings, and many service bureaus provide network connection in major cities at no extra cost. Small business users should figure the cost at $10 per hour for nationwide, telephone hookups, he said.

On the user's side of the line, a modem rental would cost about $72 to $80 per month. The cost for the use of the service bureau's CPU and storage are not prohibitive, Zatyko said, if used in small chunks.

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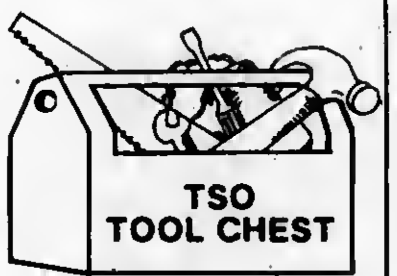

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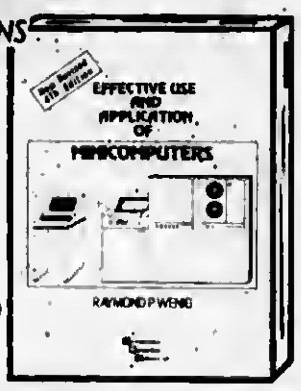
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Small-Scale 'Rerun' of NCC

Few Stars Shine at Lackluster Info Exhibit

CW at Info '78

By Tim Scannell
CW Staff

CHICAGO — Show floor scenes at the fifth international Information Management Exposition & Conference (Info '78) here last week were slightly reminiscent of an old, late-night television movie — nostalgic and, for the most part, very colorless.

The exhibits were basically the same as those at the National Computer Conference (NCC) in Anaheim, Calif., last June 6, but on a much smaller scale. However, there were a few promising stars amid the nearly 200 exhibitors present at the four-day extravaganza, which took place at McCormick Place.

Qantel Corp.'s Booth, decorated with flowers and various pieces of shrubbery, was designed to highlight the firm's Advanced Memory System (AMS) and three new computer systems: the models 970, 1450 and 1450-2. These upgrades of the 900 and the 1400 series feature a high-speed processor that can handle data up to four times faster than the previous models, a spokesman said.

The memory of the three recently introduced systems starts at 128K char. and can be expanded in 32,000-char. steps to more than 1M byte, whereas the previous models are limited to a maximum of 128K char.

The 970 and 1450 are compatible with all of Qantel's existing hardware and software and feature a single-board processor design, allowing for more efficient back-plane utilization, the spokesman continued. In addition, the firm has replaced 8K plug-in memory modules with 32K-byte boards and the memory access time has been speeded up from 1.1 microsec to .95 microsec.

The basic 970 system, including 128K-bytes of total memory, a CRT terminal, a 12M-byte fixed/removable disk drive and a 50- to 100 line/min printer, costs about $35,900. The 1450, with 128K-bytes of memory, CRT, 12M-byte disk drive and 300 line/min printer is tagged at approximately $44,500, while the 1450-2, with two terminals, a 25M-byte drive, printer and magnetic tape drive costs around $69,900.

Deliveries are expected to begin in the first quarter of 1979 from the firm

(Continued on Page 18)

Opportunity Not Missed

CHICAGO — While the Information Management Exposition & Conference (Info '78) was taking place here last week in one part of cavernous McCormick Place, systems of another sort were being built next door, where the Building & Construction Exposition & Conference was held.

Only two computer-related companies used the occasion to try to sell builders on their products: Computer Systems Corp. of Indianapolis had a Digital Equipment Corp.-based system for estimating and administrative work and Burroughs Corp. noted the virtues of its B80 and its Contractor Management System.

Several exposition attendees said they were interested in using computers to try to control their costs. At the same time, however, most seemed unaware of or not interested in the Burroughs display.

One contractor, however, Bruce Damaske, president of King's Men Construction, Inc. of Salem, Ore., listened avidly as the Burroughs representative manning the booth explained what the system could do for him.

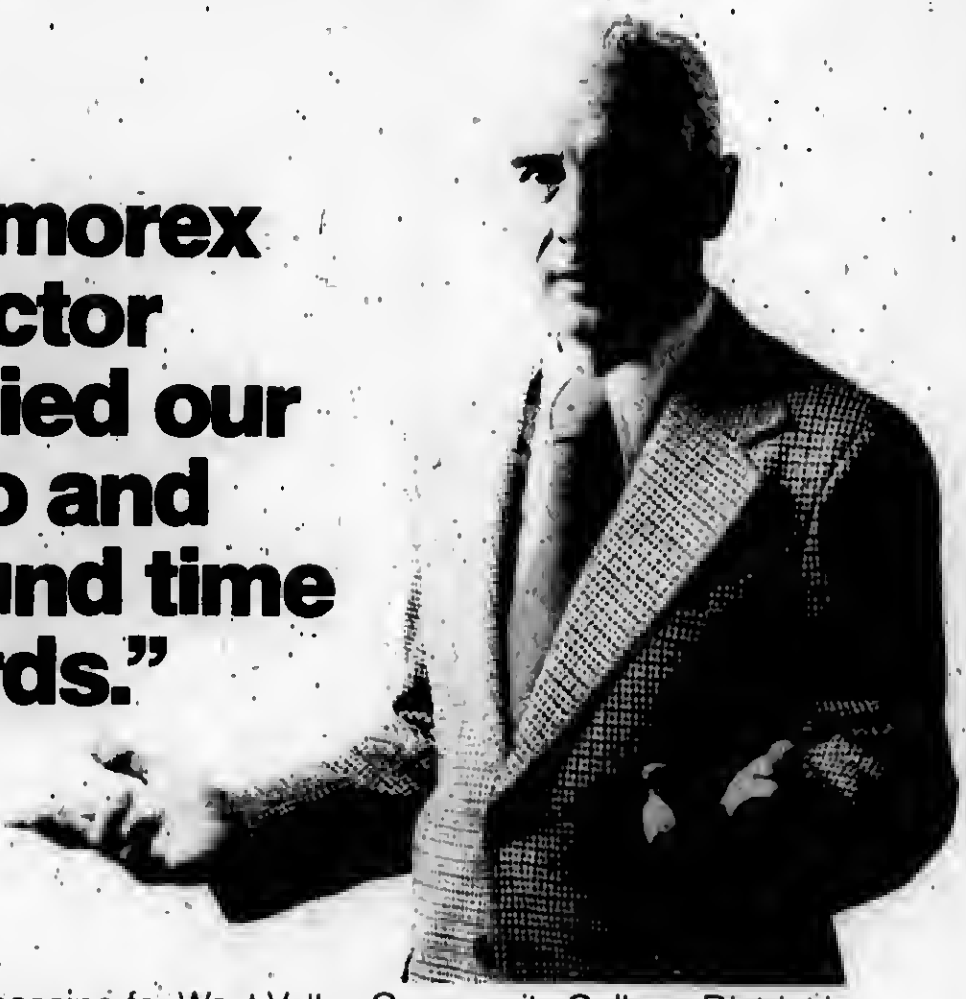
"One of the problems is that we sometimes question whether the salesmen understand the problems of our business — if they have none available, they are usually pretty quick to explain how an existing system can be adapted. But that's not what I'm after," Damaske said.

"I am very interested in these systems, but the problem is trying to decide which system to get — I have seen several others, and there are so many now that it can be difficult," he noted.

Damaske said his interest in DP had been stimulated only in the last two or three years as prices dropped significantly.

CW Photo by A. Dooley

Carolyn Dodd demonstrates Addressograph-Multigraph Corp.'s Amtext 425 system.



"Adding a Memorex 6400 Semiconductor Memory multiplied our capacity by two and cut turnaround time by two-thirds."

—Gunter Klein

Mr. Klein is Manager of Data Processing for West Valley Community College District in Santa Clara and Saratoga, California. From its two campuses in the heart of the Santa Clara Valley, home of the semiconductor industry, the district serves over 23,000 students. Approximately 500 of them are enrolled in courses involving direct use of the college's data processing system.

"Before leasing Memorex's 6400 Semiconductor Memory for our System 370/135, we had a total capacity of 512K and our response time averaged 15 seconds. Now our students get a response within 3 to 5 seconds with the addition of the new memory and a new T.P. monitor."

Besides providing for student needs, Mr. Klein's department also serves the college's administrative, management and record-keeping needs with 32 on-line CRTs.

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Communications Products Let Users Alter Features

By Ronald A. Frank
CW Staff

CHICAGO — Data Communications products with user-alterable features were among the devices featured by firms at the Information Management Exposition & Conference (INFO '78) here last week.

Racal-Milgo Information Systems, Inc. of Miami demonstrated the System 185 network diagnostic controller which features microprocessor-based monitoring and diagnostics and permits management of networks from the user's central site.

The 185 allows line and modem control of IBM 3600 finance communications loop systems using Racal Milgo 1,200- or 2,400 bit/sec loop modems. The 185 provides the DP center operator with an indication of network problems and can also be used for fault isolation at unattended sites.

In addition, the system gives the user the ability to switch from primary to secondary modems at unattended remote sites, a spokesman said.

A 16-channel System 185 costs $10,900 or $43/mo on a 30-month lease, the company said.

One of the units that operates with the 185 is the Remote Modem Transfer Switch, which is installed at the remote site and allows automatic switchover to a backup modem when the primary modem malfunctions. It is priced at $980 or $30/mo. on a 30-month lease.

The Racal-Milgo loop modem series (LMS) provides users of IBM 3600 finance terminals with the ability to operate on-site loops at either 1,200- or 2,400 bit/sec. The Model 12 LMS costs $2,110 or $76/mo, while the Model 24 LMS costs $2,650 or $90/mo, both on a 30-month lease, the company said.

Clustered Terminal

Teletype Corp. of Skokie, Ill., demonstrated the first working prototypes of its Model 4540 microprocessor-controlled clustered intelligent terminal. The terminal, which features IBM 3270 compatibility in certain models, was demonstrated in a synchronous, multipoint, private-line configuration designed for inquiry/response transactions.

The 4540 will be priced at about $3,350, depending on the configuration, and first deliveries are scheduled for the first quarter of 1979, a spokesman said.

CW Photo by A. Dooley

Gene Piatkowski of AT&T tries out microprocessor-controlled customer access unit of the firm's Horizon system.

Teletype also showed a forms access printer on its Model 40 CRT series. Designed for printing tickets, receipts and similar documents, the printer is priced at $3,800 in the receive-only version with delivery in about 150 days, a Teletype spokesman said.

CW at
Info '78

Computone Systems, Inc. of Atlanta showed its terminal-in-a-briefcase designed for accessing insurance and other data that requires interaction with a large data base. Using plastic templates, the user preprograms a series of 64 thumbwheel switches, which set up the required input conditions.

Called the Micro-VIP 600, the terminal can produce hard-copy CPU using a built-in printer. Audio response output from the CPU can be handled via a built-in speaker system. The intelligent terminal costs $2,850 with lease plans available, the company said.

Atlantic Research Corp. introduced a fallback switch system that allows the user to switch to an alternate phone line or CPU port when malfunctions occur. Designated the FBS-1-1CM, the system is priced at $2,728 and is meant for use in conjunction with other test equipment supplied by the firm. The company is located in Alexandria, Va.

AT&T demonstrated its Horizon system, which provides programmable key set capabilities to users with 20- to 60-line installations. One of the key features of the Horizon is a user-programmable customer access unit controlled by a microprocessor.

By altering firmware in the access unit, a user can dynamically reconfigure the stations in the system without having to call for assistance from phone company craftsmen, an AT&T spokesman explained.

The Horizon system has been used on an experimental basis in the Louisville, Ky., area since May 1977, but Bell System operating companies in most areas are expected to file tariffs for the system "by the end of 1978," AT&T said.

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Interactive System Tops Line

NCR 8270 Leads Parade of Hardware Debuts

By Howard A. Karten
CW Staff

CHICAGO — An addition to NCR Corp.'s 8200 family led a generally short parade of product introductions at last week's Information Management Exposition & Conference (Info '78) here as exhibitors concentrated on demonstrating products introduced at previous DP shows.

Minicomputers, mid-scale systems and distributed systems seemed to predominate at Info, with few large-scale systems in sight. The robots Orion and Klatu, seen at last June's National Computer Conference, have not yet decided what system to buy — both turned up on the Info floor.

NCR unveiled its 8270 interactive system, topping off its 8200 family. The unit includes a CPU with memory ranging from 128K to 512K bytes, 54M to 324M bytes of fixed and removable disk, a variety of printers with speeds ranging from 125- to 900 line/min, three to 24 CRTs and other peripherals such as flexible diskettes, magnetic tape cassettes and magnetic tape drives.

The unit is said to use NCR's range of interactive multiprogramming application programs and operate as a free-standing unit or linked with other systems in a network configuration. Compilers available with the 8270 include Cobol 74, a spokesman said.

A basic system with 128K bytes of memory, three CRTs, a 125 line/min matrix printer and 54M bytes of disk is priced at $62,305 or $1,633/mo on a five-year rental. First deliveries of the system will be made in October 1979, the spokesman said.

Printer Debuts

Decision Data Computer Corp. of Horsham, Pa., used the occasion to introduce its 6600 series of line printers, available in speeds of 300-, 450-, 600-, 900 and 1,600 line/min. The 6600 family can print forms ranging up to 16.75 in. wide on six-part forms, with a spacing of 10 char./in., a spokesman said.

The printers can replace IBM System/34 and Series/1 printers.

Prices on the units range from $13,750 for the Model 6606-34 to $41,175 for the Model 6615. Rental prices are $390 and $1,255/mo, respectively, on five-year-leases.

Also introduced by Decision Data were the Model 6540 serial printer and the 3240 printer terminal. The two printers feature a 9 by 7 dot matrix and a serial/impact printer method, the spokesman said.

Two interfaces, an RS-232C and a 20 mA current-loop interface, are available with the units which operate at 110-, 300- or 1,200 char./sec.

Standard features on the terminal include bidirectional printing, a 96-character set, 512-character internal buffer and double-size character set. A 13-key numeric keyboard is optional on the 3240.

The Model 3240 costs $2,850 and the Model 6540-2 printer costs $3,975.

NEC Information Systems, Inc. also introduced a printer, the Model 5510c Spinwriter. The 55 char./sec system can print optical character recognition (OCC) quality characters, a spokesman claimed, at a maximum line width of 163 characters (for 12 char./in. size) or 136 columns for the more standard 10 char./in. size.

A Centronics Data Computer Corp. type of interface comes as standard with the printer, which sells for $2,750 from the Lexington, Mass. based company.

C. Itoh Electronics, Inc. also introduced a printer, the Model 820, featuring an 80-column, dot matrix impact printer mechanism. The 84 line/min; 5 by 7 dot matrix device accepts paper up to 9.5 in. wide, using a sprocket paper feed mechanism.

A maximum of one original and three copies can be printed on the $300 device, a spokesman for the Los Angeles-based company said.

Qume Floppy

Qume Corp. joined the ranks of floppy disk drive manufacturers with its Datatrak 8, a double-sided, double-density unit. The device is said to be fully compatible with the IBM System/34, 3600, 3740 and System/32 drives, accepting a Diskette 2D or equivalent disk.

CW at Info '78

The drive has a transfer rate of 500K bit/sec with a capacity of 1.2M byte/-disk (IBM format), a spokesman said, and sells for $755 from the company in Hayward, Calif.

Anderson Jacobson, Inc. introduced its AJ 510, a 7 by 7 dot matrix terminal with a full 128 character Ascii set and 40-character graphics set. A 15-in. screen on the unit can display 24 lines of 80 columns each, according to a spokesman.

Asynchronous data is transferred from the unit via its two RS-232C ports directly to a printer through a modem. Data rates on the unit are switch-selectable from 110- to 9,600 bit./sec.

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1) These books were written by an expert from industry, Kevin McQuillen. He's been a DP manager, consultant, and manufacturer's rep, so his books are chock-full of solid, practical, real-world advice.

2) Kevin selected the content of these books based on an analysis of the tasks normally required of an applications programmer. That's why these books contain everything of use to the average programmer and very little that isn't. That's also why the books give substantial coverage to job control language. The DOS book covers DOS and DOS/VS; the OS book covers MFT, MVT, VSI, and VS2.

3) The books are organized in the most effective way possible for a programming course. Quite simply, a complete subset of BAL is presented in the first three chapters of the book. After this, all material is organized by function (debugging, table handling, subroutine linkage, etc.). As a result, the student always sees the relationships of the parts.

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Few Stars Light Up Show's Colorless Floor

(Continued from Page 15)

in Hayward, Calif.

Basic/Four Corp. introduced both a word processing enhancement and a forms entry system (FES) for its System 610 and 730 minicomputers. Both systems allow word processing and file management/communications to continue concurrently with regular DP functions using the same data base, a representative explained.

The Dataword word-processing system uses a "menu-driven", tutorial approach to assist the user. The software/-hardware package features not only text editing capabilities but also a work measurement system that enables the user to monitor the operations.

The word-processing enhancement can draw on a large hard-disk storage capacity using 35M- or 75M-byte spindles, which provides for a large volume of text storage, the spokesman said. Dataword also features a "sub-menu" program that lists specialized document forms and a view directory control that allows users to purge unwanted files.

Block move, another system feature, lets the user insert a page or a part of a document on file elsewhere into the document being typed, the spokesman added.

The firm's other introduction, the FES enhancement, features concurrent processing capabilities and operates in a "preprogrammed environment," the spokesman pointed out.

The operator initially defines each field to be entered and the constraints on that field. Information is input via keyboard and the data files created according to the conditions previously specified by the user. As the data is captured, it is input validated and can also be password protected, the spokesman noted.

The forms entry system also has a multiterminal source data collection capability, fast screen format generation and built-in verification and update controls.

Dataword is priced at $12,500 including a text display terminal, a word processing printer, controlled and software.

Qume Diskette Drive

Qume Corp. of Hayward, Calif., took advantage of the Info show to announce a dual-sided, double-density diskette drive that can store 1.6M bytes of unformatted data and 1.2M bytes of formatted information. The IBM-compatible drive features a track-to-track access time of 3 msec and an average access time of 91 msec, a spokesman for the firm said.

Datatrak 8 can also attain a transfer rate of 500k bit/sec and the disk drive's standard options include file protection and a programmable door lock.

All of the drive's components are modular in construction and aligned on a single-piece baseplate, the spokesman stated. Index sensors, file-protect sensors and motor are in fixed locations, which reportedly minimizes adjustment requirements.

Datatrak 8 deliveries are scheduled for the first quarter of 1979 and the unit costs approximately $755.

Datagraphix, Inc. of San Diego, Calif., demonstrated a prototype of its Model 132B CRT terminal, an upgrade of the 132A.

The 132B is similar to the A model in that it is microprocessor-controlled and RS-232C compatible. It forms 132 char./line.

However, the new model features an expanded keyboard with 12 function or "sequence string" keys, an 11-key numeric pad and 27 control keys. The terminal also has several page and forms mode functions that control the number of characters per line, lines per page and number of pages, as well as the memory size allocation.

In addition, the 132B has a field-protect option that identifies protected fields by producing them in dimmer characters.

The Datagraphix, Inc. upgrade, scheduled for delivery after Dec. 1, is priced $500 higher than the 132A for $4,450.

Finally, NEC Information Systems, Inc., of Lexington, Mass., displayed its line of microprocessor-controlled printers. The Trimliner series is available in either a 300 line/min or 600 line/min model and both print 136 columns at 10 char./in.

The 300- and 600 line/min printers are priced at $5,175 and $7,450, respectively, from the Dayton, Ohio-based company.

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Their Survival at Stake

DP Managers Urged to Use DDP Technology

By Marcia Blumenthal
CW Staff

CHICAGO – DP managers are going to lose the distributed data processing (DDP) battle to line management, so devising a way to introduce DDP technology into the organization that will allow DP managers to come out of the trenchs unscathed is a must, according to Cornelius Peterson, president of Distribution Management Systems, Inc. "Survival" was one of the key words used to describe the situation DP managers face when they resist operational management's desire to introduce DDP into the organization.

Speaking at a session of the Fifth Information Management Exposition & Conference (Info '78) here last week, Peterson said DP managers who can manage their organization's transition to DDP will become pivotal figures within their firms.

Inexorable Trend

It does no good to resist minicomputer-based DDP technology when the technology generates revenue for the corporation, Peterson said bluntly.

The much discussed question of whether to accept or reject DDP is now moot, he maintained. The issue may have been a hot one "a few years ago when I had to explain that Digital Equipment Corp. was not a manufacturer of watches," Peterson joked.

Attempting to offer yet another entry in the race to define DDP definitions, Peterson stressed that DDP must work for operational management. "It must support the day-to-day operation in remote locations instead of remote locations supplying data to update accounting files," he stipulated.

"DP managers examine intelligent terminals and think they have DDP, but all they have is remote data entry," he added.

Three Arguments

Peterson refuted the three major arguments made by DP managers against DDP. The contention that DP managers can't control software maintenance and development is simply not valid, Peterson said.

In fact, the DP manager gains control because minis in the field are performing dedicated work and are operated by non-DPers.

According to Peterson there is no software development going on unnoticed in the field.

Issues Remain

The issues of software maintenance and reliability remain, regardless of what kind of a system a company has, he noted. Speaking to DP managers' concern for technological changes not compatible with minis already installed, Peterson said that mini makers, like mainframers, must protect their installed bases. The attention to the installed base ensures stabilized technology and minimizes the risk of obsolescence, Peterson insisted.

A third fear of DP managers is that a non-DPer, such as a financial vice-president or a distribution manager, will push for a distributed system. "Computer professionals," Peterson emphasized, "must get used to the idea that their mystique is eroding."

The issue of loss of control is a perceptual problem, Peterson suggested. Line managers view mainframes as overpowering and controlling. Those managers do not fear minis because they feel that within a decentralized organization, they have already lost some control, Peterson reasoned.

DP managers, on the other hand, feel the proliferation of minis signals the loss of control. These managers are wary of any system that is not hierarchical.

The DP manager is going to have to yield to the line manager's perception, Peterson contended, because "not only are minis economical, they are oriented to people – ordinary people – and that is why they are valuable.

CW at Info '78

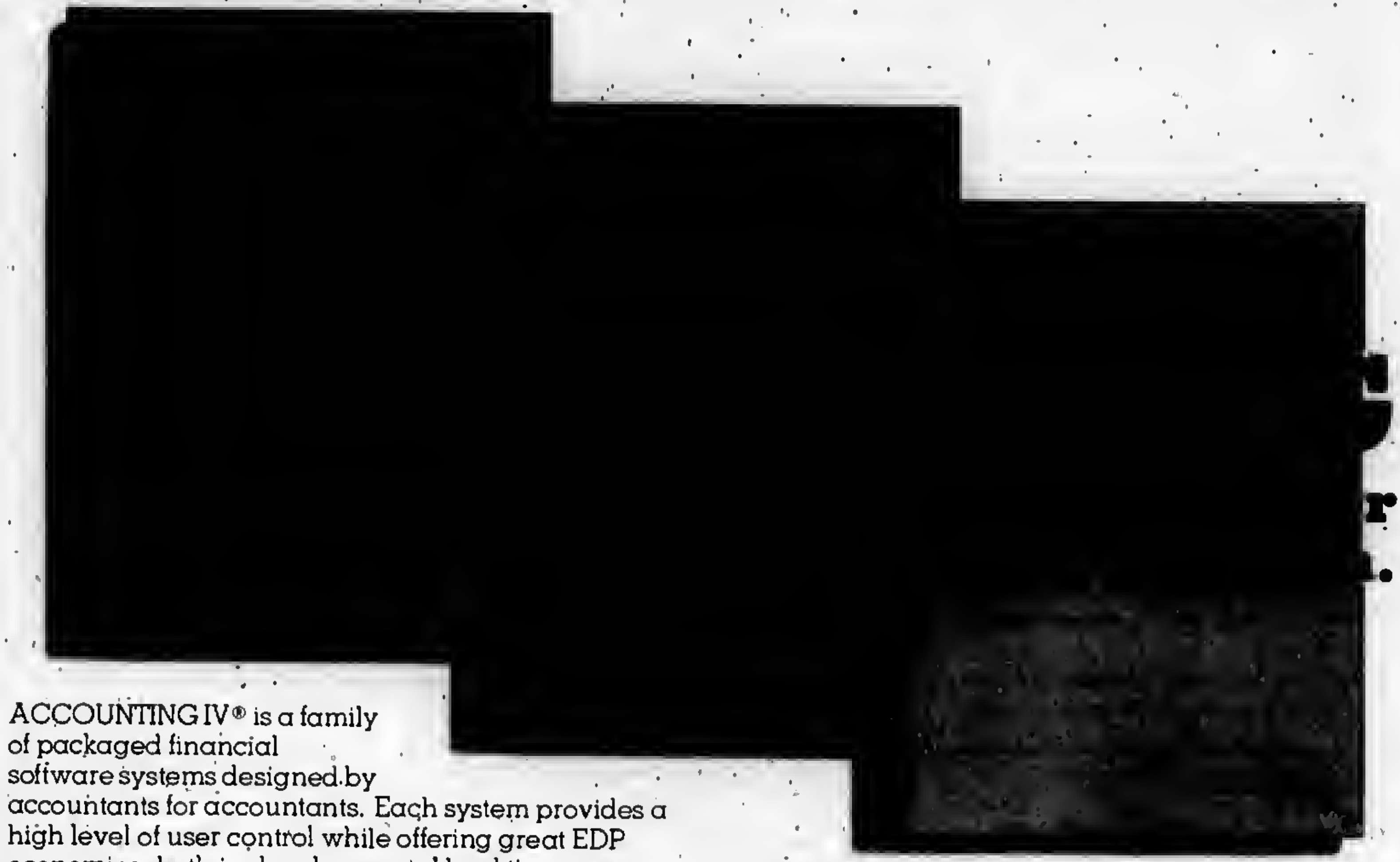
World Data Flow Newsletter Topic

BROOKLINE, Mass. – Information Gatekeepers, Inc. (IGI) has announced publication of a newsletter devoted entirely to questions and issues of transnational data flow.

According to Dr. Paul Polishuk, president of IGI, "TDF Newsletter" will have several objectives:

- Complete coverage of laws affecting transnational data flow.
- Assistance to firms doing international business which need to obtain up-to-date information and accurate interpretation of data protection laws.
- Analysis of decisions affecting the free flow of information between nations and assessing their impact on business.

The monthly newsletter will sell for $75 (U.S.) and $100 (foreign), IGI said from Suite 212, 167 Corey Road, Brookline, Mass. 02146



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Managers on the Move

ROBERT C. JOST has been promoted to manager of programming services by Drew Chemical Corp. in Boonton, N.J.

Jost, a graduate of Fairleigh Dickinson University, joined Drew in 1971 as a systems analyst.

• • •

RICHARD F. RAY has been named systems director in the customer services area of GTE Data Services, Inc.'s systems development organization.

Ray joined the General Telephone Co. of the Southwest in 1967 and, after a series of regional promotions, became customer services director for General Telephone of California in July 1978.

He holds a bachelor's degree in business administration from Angelo State College, San Antonio, Texas.

• • •

JOHN V. LEDWITH JR. has been appointed vice-president of management information systems for Morton's Shoe Stores, Inc. of Boston.

Ledwith previously held computer systems, programming and management positions with Corning Glass, 3M Co., Bennett Importing Co. and Sanders Associates. He most recently served as vice-president of administration at Hampshire Manufacturing Corp., a Morton's subsidiary.

• • •

GERALD P. MEIER has been named director of data processing for ACF Industries, Inc. of New York City.

Meier, formerly manager of the Systems Division for the Carter Automotive Group, will now be responsible for data processing and programming for all of ACF.

He holds a bachelor's degree in commerce and a master's degree in management sciences from St. Louis University.

• • •

WALTER MULLEN has been appointed director of technical services at IMS Systems Corp. in New York City.

Prior to joining IMS Systems, Mullen was employed for 10 years by New York Life Insurance Co. in a systems management capacity.

• • •

PAUL ZIMMERMAN has been named manager of management information systems at J. Riggings, a division of U.S. Specialty Retailing in Atlanta.

Zimmerman will be responsible for systems, programming and DP operations for the J. Riggings and Outrigger divisions.

Prior to joining J. Riggings, Zimmerman had been associated with Rich's in Atlanta and the National Bank of North America in Long Island, N.Y.

• • •

ARTHUR CHESTER has been appointed director of management information services at Itel Corp.'s Industrial and Business Products Group in Rochester, N.Y.

Chester came to Itek from Rochester Telephone, where he was manager of minicomputer development and was largely responsible for the introduction of the state-of-the-art systems now employed there.

He holds a B.S. degree in economics from Canisius College and is also a graduate of the International Data Processing Institute.

Robert C. Jost

Call for Papers

TRENDS AND APPLICATIONS 1979: ADVANCES IN SYSTEMS TECHNOLOGY; Gaithersburg, Md., May 17, 1979.

The theme of the conference is systems technology which will impact the '80s with specific interest in developments in computer architecture; distributed processing; micros in consumer products; office system technology; networking technology; embedded micros; and security from a system's viewpoint.

Papers which deal with evolving applications for advanced systems technology are also desired.

Three copies of 1,000-word abstracts should be forwarded by Dec. 15 to Patrick V. McGregor, Network Analysis Corp., 410 Pine St., Vienna, Va. 22180.

SOUTHEASTCON 79, Roanoke, Va., April 1-4, 1979.

Authors are invited to submit papers on new developments in the theory, concepts, techniques and applications of electrical and electronics engineering. Papers are solicited in such areas as aerospace electronics and systems, bioengineering, computers, microprocessors, communications, control systems, digital devices, education, electromagnetic fields, electro optics and laser applications, environmental monitoring and modeling, energy technology, instrumentation, management, microelectronics, pattern recognition, power systems, semiconductor devices and transportation systems.

For full papers, abstracts of 50 words and a summary of 200 to 500 words or for short papers, four copies should be submitted as soon as possible to Prof. L.L. Grigsby, Technical Program Chairman, Southeastcon 79, Department of Electrical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

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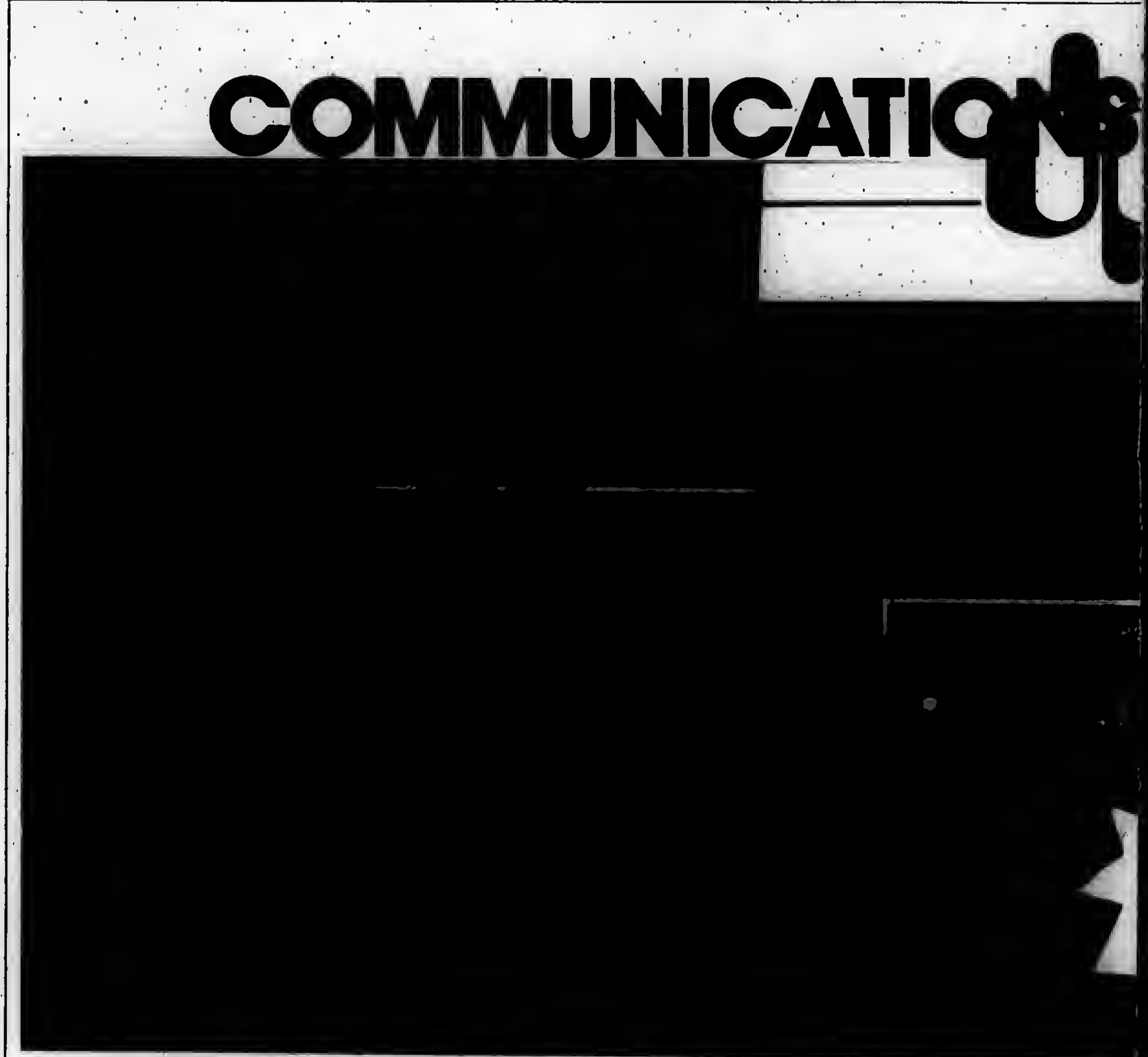

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BAI Survey Finds

Average-Size Bank Spends 6% of Budget on DP

By Tim Scannell
CW Staff

PARK RIDGE, Ill. — The average-sized bank — one whose total assets run from $100 million to more than $5 billion — spends $276,483 per month or approximately 6% of its overall operating budget on computer hardware, software and other DP-related items, the Bank Administration Institute (BAI) recently found.

Of that 6%, $114,418 is allocated for equipment and maintenance while $162,065, or 3.33%, is spent on DP supplies and support, the BAI said.

The BAI arrived at those figures after surveying 107 banks which reportedly represent all the nation's 14,000 banking institutions. Twenty-eight of the banks surveyed have assets of $100 million to $250 million, 23 are in the $250 million to $500 million bracket, 18 have assets of $500 million to $1 billion, 29 have $1 billion to $5 billion in assets and 16 have assets of more than $5 billion.

Spending Increase in '78

The BAI statistics showed the average bank is spending 12.24% more on hardware in 1978 than it did for DP equipment in 1977.

Nearly 1.5% of a bank's total operating budget is consumed by mainframe, tape drive, disk drive and printer acquisitions while .1% and .15% are absorbed, respectively, by on- and off-site minicomputers and teller terminal installations. The smallest part of a bank's total DP expenditures — .042% — is spent on microfilm/micofiche equipment and on tab or keypunching units (.035%), the report noted.

Big Bank, Small Percentage

The report found that banks with larger assets spend a smaller percentage of their operating expenses on DP. Banks with assets of $5 billion or more invest approximately 3% of their total operating budget in DP, while banks in the $100 million to $250 million category spend nearly three times as much — 8.6%.

The larger banks expend .036%, .382% and .164% of their budgets on software, systems programming and management, respectively, while smaller institutions shell out .656%, 1.026% and .765%, the report pointed out.

The BAI noted that of the 107 banks surveyed, 77% operate their data centers seven days a week and the other 23% shut down their DP facilities for an average of 37.5 hours per week.

The survey also found that 64.4% of the banks sell their DP services to other banks, 27% sell computer time and approximately 20.4% sell software packages.

Course to Focus On Protection Of DP Assets

WASHINGTON, D.C. — If you as DP manager would like to have your company's security officer on your side instead of on your back, why not suggest that he attend a three-day course on the protection of computer assets here Nov. 6-8?

The course is sponsored by George Washington University. It will be led by Robert Jacobson, a certified protection professional on leave of absence from Chemical Bank of New York, where he serves as assistant vice-president for information systems security.

Jacobson is presently staff director for the New York Contingency Facility, a consortium of 16 New York area firms established to study the feasibility of a shared backup computer center.

Focus of Course

Instructors include James P. Anderson, an independent contractor and computer technology consultant, and Lt. Col. Robert P. Campbell of the U.S. Army, who is responsible for the Armywide Automation Security Program.

The course will focus on understanding DP operations, tools and techniques for protecting computer assets. It will emphasize risk analysis, fraud and embezzlement, investigation of computer crimes and evaluation of the current security environment.

The course costs $465. Additional information is available from Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

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BAI Survey Finds

Average-Size Bank Spend

By Tim Scannell
CW Staff

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CRO CONTROL

Resource, Econometric Models

Firm Building Software to Predict Energy Use

By Brad Schultz
CW Staff

BOSTON — A nonprofit consulting firm here has developed software that predicts how much electricity an entire state will consume 20 years into the future.

A partnership of eight ex-university professors trained in mathematics, physics and the social sciences, Energy Systems Research Group, Inc. develops models that predict utility consumption — 20 years is a standard forecasting time frame — as well as energy resource shortages and the impact of power plant construction and government energy policy on local economies.

Further, the firm evaluates other organizations' analyses and in the process has testified in malpractice litigation between public agencies and other private consulting groups.

Energy Systems personnel have formed opinions about a number of well-known computer systems, since a customer contract frequently requires implementation on the customer DP facility.

For example, a model predicting New York State's electric consumption, which takes into account economic changes, resource shortages and population shifts over the next two decades, was implemented on a Honeywell, Inc. 6000 series mainframe called "decidedly inferior" by Energy Systems' only full-time programmer, William Kreuter.

"Given any choice in the matter, we would not have used the Honeywell system," Kreuter remarked, explaining he discovered bugs in Honeywell's Fortran-supplied subprograms — for instance, the CALLSS function — and found the vendor's Time-Sharing System (TSS) to be inflexible in handling mass storage.

The TSS text editor was perhaps too powerful in the sense that errors in the act of editing too easily destroyed the file at hand, he said, adding he was forced to reload programs from backup magnetic tapes "probably two dozen times" as a result. The system documentation, however, was found to be essentially superb.

Energy Systems developed this model under a contract with the New York State Department of Environmental Conservation that required implementation on the facility normally used by the department, the Honeywell 6000.

Energy Systems has also produced software to generate maps showing heat demand levels within New York City. This project involved simulation of both heating buildings and driving air conditioning equipment with waste steam heat from Consolidated Edison power plants, according to Dr. John K. Stutz, principal research scientist.

The firm has also studied the effects on local unemployment of establishing a nuclear power plant in Long Island, N.Y., he added.

Building Package

To produce a utility load forecasting package, the firm must accumulate a wide range of information, including the amount of power drawn by a typical refrigerator, the number of households in the subject territory, their rate of growth and economic time-series data such as "production and earning indexes."

The Energy Systems researchers work out a set of equations for using this data, Stutz noted, and these equations are turned over to Kreuter, who writes them into Fortran IV routines.

Aside from writing the basic computation routines, Kreuter must produce systems-level software that allows customer personnel without DP training to receive various types of data in response to terminal-fed natural language queries.

Sensed a Need

Energy Systems began in 1976 as a collaboration of State University of New York at Albany (Suny/Albany) colleagues who sensed a growing emphasis on planning by public administrators.

According to Stutz, this trend resulted from the economic misfortunes of the 1970s — cost-push inflation, recession and energy shortages — and has sparked the proliferation of economic forecasting specialty houses like Energy Systems that are utterly dependent on DP technology.

The firm has fond memories of the Suny/Albany computing workhorse: a Univac 1110 mainframe with Exec 8 operating system. As Suny/Albany faculty members, the researchers were able to use this facility until formally leaving the university in 1977, Stutz said.

They switched to Rensselaer Polytechnic Institute's IBM 360/168 with the Michigan Terminal System (MTS) and began converting programs from Univac Real-Time Basic (RTB) to MTS Basic.

But the latter was soon rejected in favor of MTS Fortran IV. The available Basic was just a slight improvement on the Dartmouth version used to teach programming, while MTS Fortran IV appeared more powerful for scientific applications, Kreuter explained.

Kreuter termed MTS "a pretty good controlling language," but called the Univac Exec 8 "much more versatile."

The defects of MTS Basic became apparent during the firm's development of a utility load forecasting program for the Philadelphia Electric Co.

Fortran IV was used for the next utility forecast — for the Pennsylvania Power Co. — and all others since, and Stutz indicated Energy Systems will probably stay with this language through the near future.'

Energy Systems moved to Boston this summer and is satisfied with the facility that presently handles most of its DP jobs: MIT's IBM 360/168 with the Conversational Matching System.

In programming terms, econometric models are notorious for the extent of their variable dictionaries. Stutz described Energy Systems' challenge in developing forecasting software as expediting the required numbercrunching while tailoring the system to an end-user environment.

Accordingly, the research group has stretched Fortran IV to uncharacteristic forms, enabling the host system to field a tall hierarchy of questions, Stutz said, noting the total number of user modes in the Environmental Conservation package "is on the order of several dozen."

The only peripheral locally used by Energy Systems is a Texas Instruments, Inc. Silent 700 terminal.

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'Fed' Completes National EFT Net of 35 ACHs

WASHINGTON, D.C. — The Federal Reserve Board has announced completion of a nationwide electronic funds transfer (EFT) network linking 35 automated clearinghouses (ACH) via the computerized Federal Reserve Wire (Fedwire).

The network now serves about 9,400 banks, 1,500 thrift institutions and 6,000 customer corporations that belong to affiliated ACH associations, a spokesman for the "Fed" said.

These member organizations can present payment instructions on magnetic tape to the nearest Federal Reserve facility for transmission nationwide, he explained. The network joins 34 Federal Reserve DP sites and one privately operated installation.

At present, most of the payments transmitted over the network are of a repetitive nature, including payroll deposits, mortgage payments and U.S. Treasury deposits for Social Security beneficiaries. A magnetic tape bearing instructions for payroll deposits, for example, might contain instructions to make salary payments to a company's employees located in many parts of the country, the spokesman explained.

The Federal Reserve Bank or branch office that receives such a tape passes the instructions to other ACHs via the network.

A pilot program for a national EFT network was approved by the Federal Reserve in 1975 and started the following year. The network's last links were formed in September.

Western ACH sites are located in Denver; Los Angeles; Portland, Ore; Salt Lake City; San Francisco; and Seattle. Eastern ACHs are in Boston, Philadelphia and Pittsburgh.

Southern installations exist in Atlanta; Baltimore; Birmingham, Ala.; Charlotte, N.C.; Columbia, S.C.; Jacksonville, Fla; Louisville, Ky.; Memphis and Nashville, Tenn.; Miami; New Orleans; and Richmond, Va.

The other Federal Reserve ACHs are in Chicago; Cincinnati, Cleveland and Columbus, Ohio; Dallas; Des Moines, Iowa; Detroit; Indianapolis; Kansas City; Milwaukee; Minneapolis; and St. Louis.

The privately operated facility is the New York ACH Association in New York City.

Corbato Gets MIT Chair

CAMBRIDGE, Mass. — Fernando J. Corbato has been awarded the Cecil H. Green Professorship of Computer Science and Engineering at MIT.

Best known for his roles in developing MIT's Compatible Time-Sharing System and Multics, the security-oriented operating system marketed by Honeywell, Inc., Corbato is expected to continue his research in very large-scale integrated circuit design.

The two-year appointment is one of six chairs established at MIT in 1970 to give individual faculty members in computer science and electrical engineering an opportunity to enter new areas of research.

Academy Fellow

Corbato joined the MIT Computation Center at its inception in 1956, after he received a Ph.D. in physics from the university. He has served in various administrative capacities at the center and other MIT computing facilities and has authored numerous research publications.

Corbato is a Fellow of the National Academy of Engineering, the American Academy of Arts and Sciences and the Institute of Electrical and Electronics Engineers. He was an Association for Computing Machinery national lecturer in 1964.

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Meanwhile, back at the home office is the 763, a tabletop model.

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Two at Drexel Get Grant

Data Base on Energy Recovery to Be Compiled

By **Marcy Rosenberg**
CW Staff

PHILADELPHIA — The U.S. Department of Energy has awarded a $1 million research grant to two professors at Drexel University here to develop a national data base that would generate comprehensive information on how to recover energy from more than 100 different manufacturing processes.

Dr. Harry L. Brown, nuclear engineer and director of Drexel's Energy Institute, and Dr. Bernard B. Hamel, a fluid dynamics specialist, are heading the project, which has also received $300,000 funding from the National Science Foundation.

The ultimate research goal, Brown said, "is to put together, for the first time, an industrial model outlining where and how energy is used in industry and ways to recover and recycle waste heat into plants."

The data base will break down how an industrial sector uses energy not only by manufacturing process— as in petroleum, food, chemical, metals or paper operations — but also by kind of waste stream, flow rate, temperature, time-of-day use and by whether the waste can be stored, Brown explained.

In addition, the data bank will contain more than a dozen different energy recovery methods, he noted, ranging from on-site power generation to heat pumps. From 300,00 to as many as one million pieces of information will be stored in the data base to match energy recovery methods with specific production needs.

Fortran and Basic

"We are using Fortran IV and some Basic machine language for the program," Brown said. "The large amounts of data and the inquiry and access modes may require some Basic."

A user would dial into the main computer, an IBM 370/-168, and access whatever information he needs from the data base through a satellite terminal in his area. The IBM computer is located at Unicoll, the computer complex at University City Science Center here, which is operated by Drexel, the University of Pennsylvania and others.

Slated for completion by this summer, the data base will be available to industrial users for a few hundred dollars.

FBI Head Set As Keynoter

PARK RIDGE, Ill. — The director of the Federal Bureau of Investigation, William Webster, will be the keynote speaker at Bank Administration Institute's (BAI) 10th National Conference on Bank Security.

The annual conference will be held April 1-4 at the Shoreham/Americana Hotel in Washington, D.C.

Webster is expected to discuss the FBI's role in bank crime in light of the recent effort by the General Accounting Office to reduce the FBI budget for bank investigation.

Further information on the conference is available from the BAI at P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill 60068.

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20	Manufacturer (other)
30	DP Service Bureau/Software/Planning/Consulting
40	Public Utility/Communication Systems/Transportation
50	Wholesale/Retail Trade
60	Finance/Insurance/Real Estate
70	Mining/Construction/Petroleum/Refining
75	Business Service (except DP)
80	Education/Medicine/Law
85	Government - Federal/State/Local
90	Printing/Publishing/Other Communication Service
95	Other ______________

11	President/Owner/Partner/General Manager
12	VP/Assistant VP
13	Treasurer/Controller/Finance Officer
21	Director/Manager of Operation/Planning/Administrative Service
22	Director/Manager/Supervisor DP
23	Systems Manager/Systems Analyst
31	Manager/Supervisor Programming
32	Programmer/Methods Analyst
41	Application Engineer
42	Other Engineering
51	Mfg Sales Representative
52	Other Sales/Marketing
60	Consultant
70	Lawyer/Accountant
80	Librarian/Educator/Student
90	Other ______________

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United Airlines Picks CAI To Teach Pilots to Fly Right

DENVER — United Airlines is using computer-aided instruction (CAI) to manage a large-scale pilot training program that will extend over the next five years. Because of retirements and increased flight schedules, United plans to train up to 1,800 new pilots between now and 1983.

"It's the first new-hire program in nine years," according to Grant Beutler, manager of training program development at United's Flight Training Center here.

"When we started planning a criterion-referenced, individualized format for this program, it was obvious we would need more than new training materials and more classroom space," Beutler said. "We also needed a quick, accurate way to test candidates, keep track of individual progress and make sure the instruction complemented each pilot's background in order to expedite the training schedule."

After an extensive study of educational technology and techniques available for handling a program of such size and critical training tasks, United installed Control Data Corp.'s Plato system with eight terminals. The CAI system handles testing and scoring, prescribes study activities, displays pilot progress and provides data for evaluating the effectiveness of the instructional materials.

The terminals, linked to a CDC Cyber 73 mainframe located in Arden Hills, Minn., display questions and problems about airplane operations. Pilots use the terminal keyboard or touch the screen to answer questions that are presented in the form of text, drawings and animated graphics.

'Study Prescription'

The results of the pilots' first test determine what their training should include. This "study prescription" may be in the form of manuals and other written materials, films, videotapes and audio tapes that are available in United's learning resource center.

Pilots return to the Plato terminals whenever they feel prepared for another test. If they pass, they have demonstrated satisfactory knowledge of the subject; if not, they are guided to additional study materials and then repeat all or part of the test.

"With this method we don't spend time and money teaching pilots what they already know," Beutler explained. "Nor do we force them through elementary materials just to get to the information they really need. There's no other training technique available that enables us to approach the individual's learning needs in such a precise way."

United's training specialists prepared nearly 3,000 questions that relate to 26 different aeronautical topics. These questions, along with simple instructions, were entered into the central computer through the Plato terminals. The Plato system software formatted this information to provide the appropriate displays to the individual pilots.

Recordkeeping Capabilities

Charles Buchanan, senior training specialist at United Airlines, noted that without the recordkeeping capabilities provided by the Plato system, the training program would be extremely difficult to manage, as well as being costly and ineffective.

"We couldn't begin to manually document all the pilots' backgrounds and select the appropriate learning materials," he said. "And it would be logistically impossible to keep progress records when pilots are at different levels at different times."

Data generated by the pilots as they work through the various tests gives United's training officials an opportunity to analyze the quality of the tests and instructional materials. For example, if a wrong answer is consistently given to a particular question, instructors know the question may be faulty.

Offers Flexibility

Through the Plato terminal, they can easily delete or change it. This same flexibility applies when it comes to changing an entire test or including reference to new learning resources.

But most important, Beutler noted, the system responds to individual learning needs in a very personal way. This involves a precise method for selecting not only subject matter, but the media through which it is delivered.

"Some people respond best to textbook readings, others to visual media such as films, slides or videotapes and still others to workbook exercises," Beutler observed.

Accurate Measurements

Considering the critical tasks associated with operating today's complex airlines, proof of proficiency is extremely important in a pilot training program. For this reason, reliable testing methods are necessary to accurately measure the pilots' progress.

If the testing procedure is not adequate, training time is extended and careers, as well as overall airlines operations, can be affected, Beutler said.

United's training officials believe the testing and reporting capabilities of the Plato system bring a new accuracy to the process of measuring individual progress against learning objectives. The tests are "mastery-oriented" and "criterion-referenced," as educators say, which means they are designed to show the extent of a pilot's understanding and whether he needs additional study in a particular area.

In addition to installing the Plato system, United has built a new learning resource center with 99 instructional units packaged in different multimedia delivery systems.

Ten Man-Year Effort

Under the direction of Ralph Beardslee, senior training specialist, the learning resources were produced within a six-month period, but represent up to 10 man-years of effort. Correlation between the study materials and the content of the tests was maintained throughout the project to ensure effective training packages.

Expanded use of the Plato system in United's training program will include the computer-assisted component of the system. In this application, interactive instructional materials — as well as tests — are provided by the system to offer a comprehensive, educational environment that serves course author, instructor, student and administrator.

With the CAI system, United plans to make extensive use of simulations to reproduce on the terminal screen the operation of cockpit systems and in-flight situations. This is expected to reduce the time pilots spend in expensive cockpit simulators.

It also will allow them to work with problems and situations that are too expensive, risky and even impossible to stage in an airplane.

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11/35, 11/45, VT50, VT52, VT61/t, VT71, RP04, RP05,
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Editorial

An IBM World?

With the proliferation of firms making or selling central processing units plug-compatible with IBM mainframes, the computer industry is rapidly becoming an IBM — or at least an IBM compatible — world.

Nine U.S. firms are now making or marketing IBM software-compatible computers — and in Japan several of the major computer makers are looking seriously at offering IBM-compatible units to their home market. This has vast implications both for computer manufacturers and to computer users.

The key to these machines is their compatibility with IBM 360 and 370 software and the rapid reduction in hardware prices over the past few years. It is extremely easy and relatively inexpensive today for an engineering group to develop and build a compatible processor.

At the same time, all of the IBM 360 and 370 operating systems are in the public domain and can be run for free on the compatible processors, saving the developers of those systems from the much more difficult task of developing operating systems.

Almost 70% of the computer users in this country use IBM equipment and software. It has been estimated that these users have invested almost $200 billion in applications software.

Users previously faced horrendous conversion costs and delays if they wanted to switch from an IBM computer to that of another manufacturer. Now, however, they can choose from a wide choice of processors — all of which operate with their present software.

In addition to their own internally developed software, users of IBM computers have the widest choice of independent software of any computer users; the software houses concentrate on IBM-compatible software because it represents the largest potential market for their products.

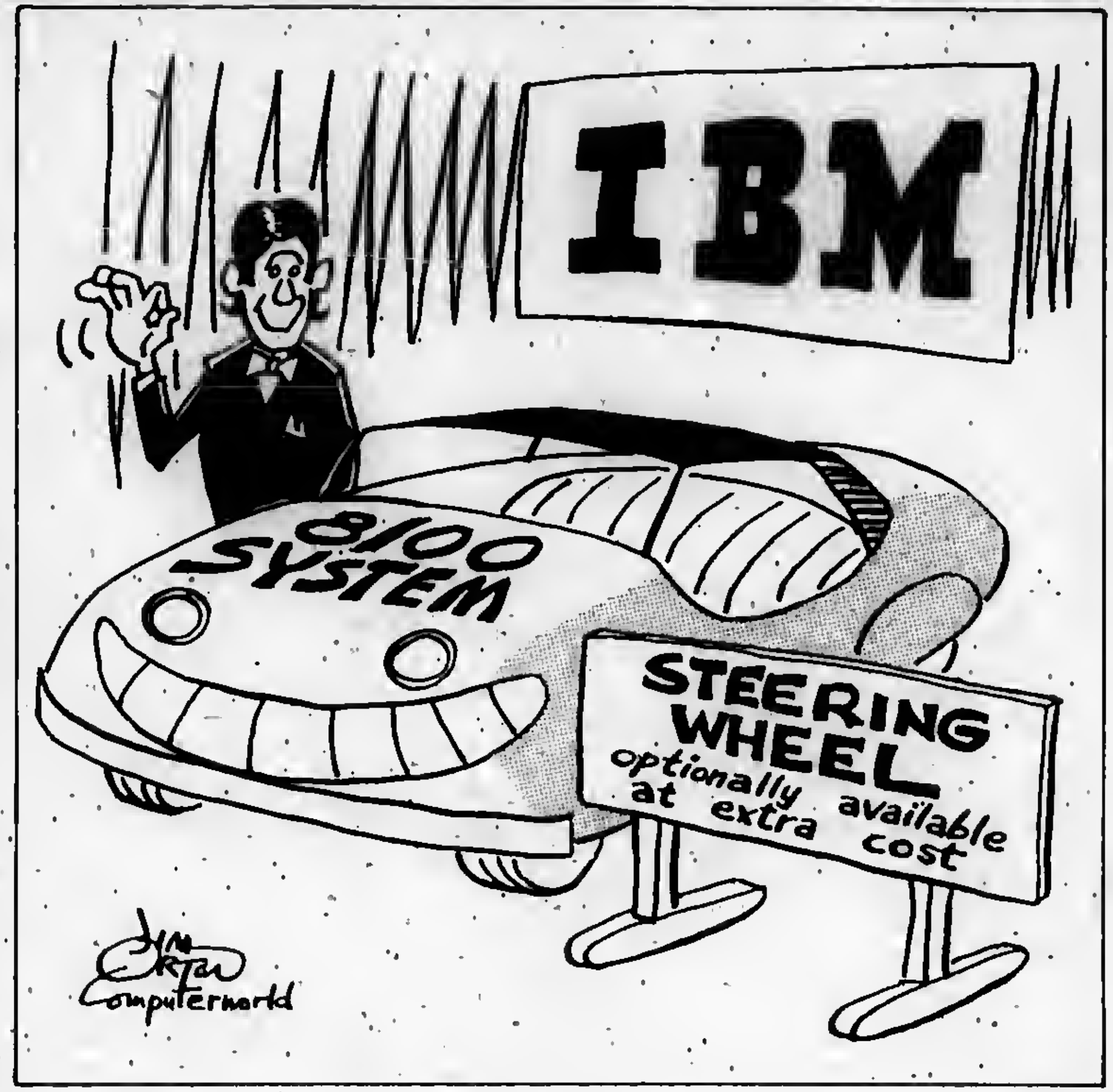
For the industry, this trend has serious implications. Until now the plug-compatible manufacturers have concentrated their marketing efforts on the large base of IBM users. In order to keep up their growth and shipment rates, they will soon be marketing to users of other computer equipment.

These manufacturers will certainly stress the advantages of having an IBM-compatible machine, and they may be successful in luring converts from the ranks of Honeywell, Univac, NCR and Control Data Corp. customers.

Each of those firms will be seeing a lot more competition in the future than they do today. And they may see some erosion of what has essentially been pretty static market shares, leaving them with the choice of getting on the IBM-compatible bandwagon or intensifying their efforts to lure the first-time user into their fold.

With all of the alternatives available; users are going to have a much harder time in evaluating their equipment purchases than they had in the past. First they will have to decide whether to go into the IBM-compatible world, then they will have to choose from all the alternatives in that world.

The entry of the plug-compatible mainframe into the DP market is certainly going to make the industry more exciting over the next few years, but it may cause a few casualties in the ranks of the more traditional mainframe firms.



Data Past

Five Years Ago
Oct. 24, 1973

TULSA, Okla. — "Easy come . . . easy go!" shouted the jaunty, almost cocky Tom Barr outside the courtroom after Judge A. Sherman Christensen set aside his $352.5 million judgment for Telex Corp. The sticking point was the IBM counterclaim charging that Telex stole IBM trade secrets for which the judge had fined Telex $21.9 million and the concept that much of Telex's success was the result of those thefts.

— — —

NEW YORK — Potter Instrument Co. decided to discontinue any further action in the antitrust damage suit it was considering filing against IBM. According to John T. Potter, chairman and chief executive officer, Potter cancelled the previous suit in return for a product development contract.

Eight Years Ago
Oct. 28, 1970

NEW YORK — Trans World Airlines, one of the largest users of Burroughs Corp. computers, filed a $70 million suit against the manufacturer, charging that "misrepresentation and breach of contract" made a shambles of the airline's passenger reservation system. Burroughs countered by filing a suit for $11.5 million to recover the balance due in the $38 million contract, which was first announced almost four years ago.

— — —

GAITHERSBURG, Md. — Dr. Ruth M. Davis was appointed director of the Center for Computer Sciences and Technology at the National Bureau of Standards here, replacing Dr. H.R.J. Grosch, who was appointed Special Research Fellow last spring.

Letters to the Editor

Erroneous Calculation

In reference to the "In Depth" article of Oct. 9, Irwin Kraus's method is interesting, but the article contained errors in the calculation of the chance of finding a figure containing a given digit difference.

He said, "Since any of the 18 differences from a transposition error have an equal probability of occurring. . ." Kraus had, at this point, already pointed out himself that there are nine ways of obtaining a difference of +1 but only one way to have a difference of +9. Obviously, the chances are nine times as good to have a difference of +1 as a difference of +9.

He continued by saying that the average probability that a figure will contain the transposition difference is 5 (the average number of ways a difference can be obtained) /90. Actually, the probability is 5/100 = .05.

There are 100 possible two-digit combinations. The 10 combinations that cannot yield a transposition error (i.e., x = y) have been erroneously excluded.

A further point not considered in the article is that as soon as we know in what column the error occurred, we may already have cut down the number of transactions that must be scanned. For example, if the error was in column 4 and 5, then all figures with less than five digits are excluded from consideration.

F. B. Wadelton III
Summit, N.J.

Contradiction by CW

Computer*world*'s association with the new Iranian magazine *Mideost* Computer [CW, Sept. 18] strikes a discordant note in CW's superb and seemingly courageous call for democratically responsible DP.

Only last December, when the Association for Computing Machinery severed its ties with Soviet computer scientists, CW made the excellent recommendation that it also dissociate itself from other repressive regimes such as those of South Africa and Chile [CW, Dec. 19].

The Iranian tyranny most recently reminded the world of its brutally repressive character by machine-gunning to death hundreds — some reports say thousands — of demonstrators in the streets of Tehran.

How can CW, without violating its own editorial policy, give editorial support to a magazine that aims to encourage computer applications by a government like this? The December editorial may have answered this question when it noted that "the U.S. computer industry will not pass up making a buck for moral considerations."

Or perhaps *Mideost* Computer will be a democratic voice crying in the wilderness. It could, for example, denounce the fact that an agency as unrestrained by legal processes as the Iranian police force is now making extensive use of computers [CW, June 20, 1977 and July 18, 1977]. However, the climate in Iran for this kind of journalism is, to put it mildly, discouraging.

If the editors of *Mideost* Computer criticize any of the Iranian dictatorship's information policies, more power to them, but they can expect a visit from Savak agents. And they might not knock.

Michael F. McCullough
Washington, D.C.

Plenty for Everyone

I would like to add one thought pertaining to the proposed nine-digit Zip Code [CW, Oct. 2]:

There will be enough Zip Codes for each person to have three Zip Codes of his own.

The problem would then be to make sure the Post Office followed us around without losing mail.

John W. Hotz
Chicago, Ill.

The Human Connection

DP Center Often Reflects Leader's Attitude

By Jack Stone
Special to CW

Last week Bob Currie told how his organization of Action program evaluators responded to the challenge of acquiring computer services support on the outside after being unable to get it from their in-house DP organization. (Action is the U.S. federal government agency that organizes volunteers for social service programs.)

I suspect it was the resourcefulness developed from his many years as a Peace Corps volunteer in the Far East that drove Bob to take the initiative for his own computer services program, but whatever it really was, the program flourishes today. (Come to think of it, Peace Corps volunteerism may be an apt cure for a large number of lethargic users I know.)

Bob had more to say about DP activities in his agency.

Under the previous management of the DP department, the all-consuming concern of its people was the maintenance of its major systems. Their typical response to our requests for aid was "We'd like to help you but we're so busy trying to meet our current production commitments that we just can't get to you."

Well, as you could expect, not only were the individual user groups suffering from the lack of support, but top managers in the agency effectively chose to ignore the efforts of the DP activity, many continuing to perform their paperwork functions in manual mode. As a good example of this situation, let me describe the situation in the budget division.

The budget people perform the classic function of taking the annual budget given to us (by Congress) and divvying it up among the various operating departments of the agency. They work hard and long doing their job, which is very tedious.

One of their responsibilities is the rebudgeting function, which is performed when new program requirements or laws or regulations dictate reallocation of funds. Well, the people up there have to examine a number of different distribution strategies on a manual basis before selecting a final choice. It is a horrendous task.

On-Line Budgeting System

A while back, the DPers addressed this problem and constructed an on-line budgeting system. The system, built around a minicomputer installed right in the building, could greatly assist the budget office in producing timely budget plans for operating programs.

However, as the budget people continue to do their reprogramming on a manual basis, they do not have time to effectively use the full capability of the automated system. Instead they use the mini primarily as a terminal to transmit summary data to the accounting application system, which is supported by the outside service bureau.

As the budget input to the accounting system is key for several accounting functions, I should note that delayed budget information causes problems throughout the system.

The lack of harmony between the budget and accounting systems has had secondary effects on the organization. Because of the heavy manual effort required for budget updates, revised budget plans are only issued at quarterly intervals, and when the new budgets reach the line managers, they are late or out-of-date and really not very useful.

Furthermore, during replanning cycles, the budgetary information is distributed through many source documents in the budget office and is not easily accessible to line managers. The image of that office, which is not warranted but is unfortunately projected, is, therefore, one of tight control over information that is vital to the line managers, lack of responsiveness to questions about budgets and poor performance as a result of tardy reports.

But I'm pleased to report that "all's well that ends well." We now have a new director of DP who has brought with him a fresh and welcome approach to us users. His style is, "How can I help you?" And believe me; it's infectious.

The DP branch heads, who seemed to be inaccessible before, have now blossomed forth. They are continually looking at how they can improve current applications to do a better job, rather than cranking up the same systems year after year with little contact with the users — not an altogether unknown phenomenon in the industry.

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

. . . And in This Corner

Banks Using DP to Avoid Facing Up to Customers

By Kenniston W. Lord Jr.
Special to CW

This year has been the "Year of the Bank" for me. My dealings with banks would have sent Mr. Average Consumer into a tailspin. For me it has been a year of frustration, expense and — unfortunately — anger.

It all began during the final week of January, when the Union Bank of Lowell (Mass.), through unauthorized deductions and keypunch errors, tagged my checking account for something more than $1,100. Three weeks later, at considerable loss of time and expense, the situation was straightened out, after a fashion, without so much as "I'm sorry."

Had only one account of a well-heeled customer been involved, it might not have counted for much; but the bank's action had secondary and tertiary effects. Worthless paper got returned from all over the country, and yours truly was marooned in Blizzard Larry, running up horrendous telephone bills trying to get the whole mess straightened out. The upshot of that was a large expenditure by me — which we will no doubt one day have to settle in court. That account is now closed.

Next came the Baybank/Newton-Waltham. That bank didn't make any glaring errors, except that it wasn't very good at communication, until forced to be. It was far easier to let the computer do the badgering.

A threat of a lawsuit got bank officials to talking and the matter was settled. It worked out that they were right, but a little concern for the customer would have gone a long way and saved a whole lot of time and money.

My current nemesis is the Northern Connecticut National Bank, which seems to feel that it's OK to misinform the customer; to cause him undue frustration; to tell him that it does not do things when it does; and to remove funds from an account without advising the customer, causing an overdraw, and then sock him with an overdraw charge for the privilege.

Two weeks after I received my "very important customer" letter, I protested the handling of my accounts to the bank's president, who responded that if I didn't like the way the bank did business, I should go elsewhere. In return, he was told "no dice" — the bank was going to perform, or I'd know why.

The crowning touch of the whole fracas was The Bank of Nashua, N.H. My balance there was 82 cents. So, when I decided to close that account, I wrote a check for that amount and deposited it to one of my other ac-

(Continued on Page 28)

The Taylor Report

'Correction' No Answer To Data Base Security

By Alan Taylor
Special to CW

A major problem in many data base systems is how to keep the data base safe from unauthorized access and modification. Traditionally either a terminal or personal password has been used to control access.

However, because of unauthorized use of authorized terminals and the changing needs of access, the password system has proven inadequate. Once authorized to use the data base, people often retain their ability to access and modify data without being "reevaluated".

An alternative to the password system, "An Authorization Mechanism for a Relational Data Base System," by Patricia P. Griffiths and Bradford W. Wade of IBM's San Jose Research Division appeared in *ACM Transactions on Data Base Systems* in September 1976. Subsequently, I commented on the suggested authorization mechanism in this column. [CW, Dec 6, 1976].

'Correction' Published

Now, a so-called "correction" has been published in *ACM Transactions on Data Base Systems* [September 1978]. This correction comes from Ronald Fagin, another IBM Research Division laboratory worker, and it is supposed to be regarded as no more than a mathematical correction of the original mechanism.

However, I disagree with the basic philosophy behind it since it favors the *right* of access over a clear danger signal to a protected data base. Let's review the Griffiths and Wade proposal and then look at why Fagin's correction is dangerous.

Although originally intended for relational data bases, many of Griffiths' and Wade's solutions, as they pointed out, were applicable to *any* multiuser data base system that dynamically grants, checks and revokes authorization.

In their system, data base developers permitted users to grant access, to delete privileges and so forth and also allowed them to pass on such privileges to others. However, such grants could be revoked at any time.

But consider what happens when a person's authority is revoked and an independent user — who is also properly authorized to grant access and delete privileges — has already made a separate grant of access to that person. A conflict certainly results.

Originally, the Griffiths and Wade mechanism interpreted a "revoke" order as a cancellation of *all* existing rights to the file.

(Continued on Page 28)

Banks Communicate Poorly With Customers

(Continued from Page 27)

counts.

The Bank processed 80 cents of the 82 cents, leaving a balance of two cents. Several letters from me and several computer-run statements later, I finally put my foot down and told the bank that if it wanted to continue to pay the administration costs for two cents, which was its money, it could be my guest.

In response, I received a certified check for two cents. Unable to resist, I notified the Bank that its books would still not balance, as there was no way I would cash that check. It is now suitably framed, in honor of the "Year of the Bank."

If we were talking about some isolated instances, this might seem like the vendetta of just one individual. However, we're talking about the repeated actions of financial institutions to frustrate the consumer with, by and through the computer, coupled with an extreme lack of valid communication and a gross insensitivity to the needs of people.

Perhaps the worst part is the downright arrogance of these institutions. They feel it's perfectly all right to manipulate customers and, further, feel they can do so with impunity. I would hazard a guess that I've not been the only one so treated.

My concept of a bank is that it should function much as a public utility. Recognizing that it is a profit-making institution, it should make every effort it can to attract my money, satisfy all my reasonable needs and do so with grace. It's inconceivable to me that I should be thankful it has condescended to do business with me.

Attempts to deal with banks as with people prove hopelessly fruitless. They understand only numbers, and so long as people are only numbers, why should they care?

There should be a law to force these institutions to deal with people directly — and particularly in cases where the bank itself has made the error.

The law should require that when the bank does make the error, it should be forced to satisfy all debt incurred by the customer when it becomes necessary for the customer to take action to straighten the bank's mess out.

Most important to me, there should be a law requiring the bank to notify its customers any time money is removed from an account, when the customer might not otherwise recognize it. Such instances include check charges, when they are made, and service charges, when they are made — not when the statement is produced. In some instances, they are radically different dates.

Too often the bank assumes the customer is guilty until the customer himself proves he is innocent. How many customers understand the process?

I'm sure I'm not alone in this regard. Let's hear of some of your bank-related experiences and what you did about them. Sooner or later, we'll find the key to make the bankers sit up and listen.

Correction Not Good Solution

(Continued from Page 27)

Now, the "Correction" permits the person whose authority from "User A" has been revoked, to continue to access the same file, because of a previous authority granted by "User B".

Imagine a bank employee gets access to a data base for two reasons: because of his active involvement in some project and by virtue of his position in the DP department. But a question about trustworthiness arises, and the DP department revokes his right to access.

The people who granted him access because of his project, however, continue to do so. In fact, they have not even been told about the revocation or the reasons for it.

That is the situation; the question is, does the "for access" or the "against access" authority prevail?

This should be decided by reviewing the function of the data base rather than the "rights" of the person claiming access. The authorization process should keep the data base secure.

Therefore, it is entirely correct to cancel all access rights when a revocation occurs. To do otherwise, *when there is only one revocation method available*, means risking the loss of security to avoid, at the most, an occasional inconvenience.

But two alternative revocation orders can be provided — one which explicitly says not to revoke any other authorization, even if it is for the same files, and one which leaves the revocation of access to a file complete, when access rights are restored in full understanding of the changed circumstances.

In any case, I can't accept Fagin's concept that the right of the one who accesses should come before the users' right to have controlled, secure access. I don't think his correction is a correction at all.

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DEC, Data General, H-P communications costs are down

If you're supporting remote terminals on your DEC, Data General, or H-P system, with more than one terminal per location, chances are you are paying a fortune in communications costs and probably not even running the terminals as fast as you'd really like to. And to add insult to injury, you have to put up with the occasional phone line 'glitch' which drives your CRT's crazy'.

What you really need is a smart little box that will provide error control for your terminals and allow several of them to share one telephone line, contending for the line when they need it, not each paying for a dedicated transmission facility, all day.

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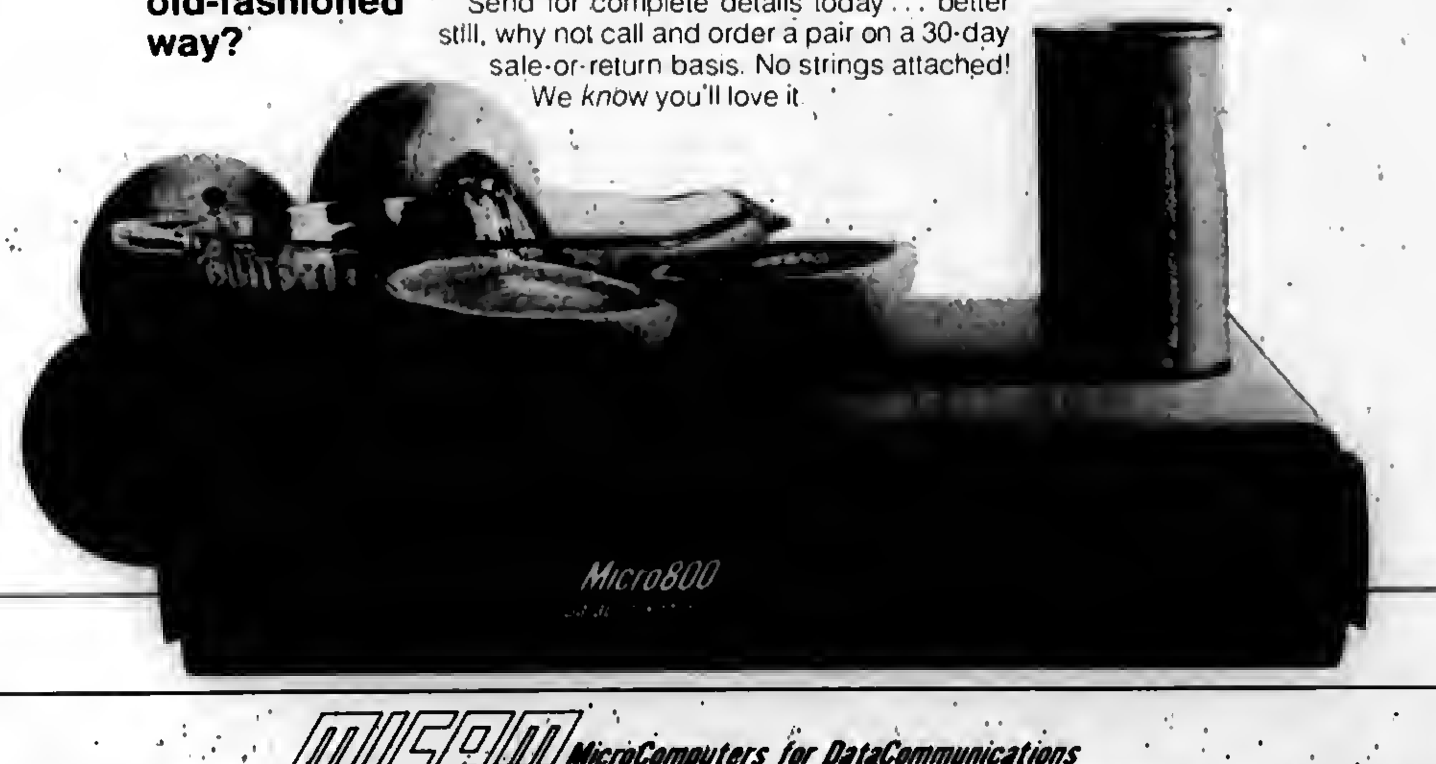

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Three Levels of Support

Honeywell Users Offered CPE Service

By Don Leavitt
CW Staff

PHOENIX — Honeywell, Inc. is now offering a three-tier computer performance evaluation (CPE) service to provide users of the company's Series 6000 and Level 66 large-scale systems with studies ranging from an overall system evaluation to a pinpoint analysis of one problem area.

All three levels of support in the Systems Optimization and Monitoring Services (Soms) focus on systems running under the Gcos operating system and all three may include use of hardware and software monitors on the user's equipment, according to a spokesman.

The reports generated by the various Soms options are said to provide detailed information in formats that are useful to both general management and DP professionals. The reports aid the user in determining the system load and tuning it for optimum performance while monitoring resource utilization and documenting such things as approaching saturation, the spokesman said.

The most fundamental of the Soms options, the Comprehensive System Performance Study (CSPS), was designed to provide users with thorough evaluations of their systems' overall performance.

Starting with information provided on a questionnaire form, each study is tailored to focus on those areas of special interest to user management.

Once the aims of the study are defined, a team of Honeywell technicians install hardware and software monitors on the user's equipment. Data is generally collected for 10 to 14 days, and the raw data tapes are sent to Honeywell's Soms center here for data reduction and analysis.

Except when the monitors are first installed, the study neither disrupts the user's operation nor preempts machine time, the spokesman said. Only minimal resources are required by the operation of the software monitor, he noted.

Within three weeks after data has been collected, a comprehensive final report is prepared by the Phoenix center and delivered to the user in a "live" presentation. At that time, Soms team members are available to answer questions or elaborate on the reports.

The CSPS report includes an analysis of current utilization,

(Continued on Page 31)

IBM Interactive Language Facility Eases System Use Under VM/CMS

WHITE PLAINS, N.Y. — An interactive language facility has been introduced by IBM to simplify the use of large-scale systems running under the Virtual Machine facility with the Conversational Monitor System (VM/CMS).

Query-by-Example (QBE) provides a nonprocedural approach to information analysis, allowing the end user — who may be a complete novice in DP — to pose queries in familiar terminology and logic. Rather than make the user work with the peculiarities of a language, it enables him to visualize the data base as a series of two-dimensional tables with rows and columns.

Full data manipulation is possible with QBE, according to a spokesman, who cited retrieval, insertion, modification and deletion of table definitions, user-stored data and stored queries as among the facilities of the Installed User Program (IUP).

Queries are made from an IBM 3270 CRT terminal using two-dimensional table skeletons, by filling in the appropriate table spaces with an example of a possible solution, the spokesman said.

The user can query the data base by using a combination of examples of the data required or by keying in actual data values — which may give the exact match wanted or the limit of a range of values, any of which are to be reported in the specified column, he explained.

In addition to its interactive query capabilities, the software provides batch extraction facilities that allow information stored

(Continued on Page 31)

UCC Profitability Analyzer Updated

DALLAS — University Computing Co. (UCC) has announced Version 2.0 of its Customer Profitability Analysis System (UCC/PAS), which is said to provide the ability to calculate and evaluate rate of return based on a customer's relationships to a financial institution.

Since UCC/PAS enables the institution to measure the bottom line profitability of individual customers, it should help bank officials determine profitable component pricing of new and existing services and measure the performance of officers responsible for soliciting or accepting customers for various services, a spokeswoman said.

Intended for IBM 360- and 370-oriented institutions, version 2.0 not only provides increased user control and flexibility, but also gives additional batch reporting and on-line capabilities, she claimed.

New reports in the update include one that selects business customers by SIC code to determine overall profitability of industry groups. Customer profitability reporting may be selected for a range of customers or by individual, she continued.

The on-line enhancements include the ability to request computation of a customer's rate of return by name, based — apparently — on data provided at the time of inquiry, permitting analysis of customers even before they are established on the system master file.

Account analysis parameters and rate fields have been expanded, the spokesman continued. "Nonautomated" account fields include funds used and supplied; they can be used for on-line entry to records not on the master file, according to the spokeswoman.

The account analysis facilities have been expanded, allowing user-defined and coded analysis procedures. Intermediate results may be printed on detail reports at the user's option, UCC said.

In addition to the system's expanded capabilities, UCC/PAS's operational efficiency has been improved. Runtimes and memory requirements have been reduced, the spokeswoman said.

Written in ANS Cobol and IBM's ALC assembler, the package can be used in various operating environments. Version 2.0 costs $25,000, the company said from 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

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DDP Definition? A Business — Not DP — Issue

By Robert Chamberlain
Special to CW

Having led several recent attempts to define "distributed data processing" (DDP) and having reviewed many well-intentioned definitions in the trade press, I am led to the observation that the wrong tack is being taken in this matter.

Too much effort is being exerted in what is becoming an increasingly aggressive attempt to "find" a definition -- as if it were tucked behind a blackboard or awaiting the probing scrutiny of a yet-unwritten doctoral dissertation.

What is being overlooked is that DDP is a business information question first and a data processing one second. In other words, there are no "distributed data processing systems" as a given; there are business information systems which may be distributed by virtue of their having significant processing characteristics or potential.

Chief Characteristics

The chief characteristic is that end-user products (reports, for example) can potentially be produced at more than one point. These points are usually geographically distinct, although they can reflect functional or departmental distinctions at the same location.

Final output may not, after analysis, be produced by DP technology at each of these sites. This is a decision to be made by senior staff from both the appropriate user areas (geographical or functional) and the DP department.

A decision not to "process" at a particular site may mean the system is not totally distributed from a DP point of view, but the key fact is that the *need* for a decision arose from business information considerations and not DP ones.

It may very well have been resolved by non-DP considerations, also. They can even include the personal and political clout of those individual players or groups who have the strength to maintain a status quo. These factors have overridden or shaped such DP input as cost/benefit analysis or computing power availability.

A second characteristic of a distributed processing system is that data is transferred from a point that can produce an end-user product to another point that can produce an end-user product.

This is generally but not necessarily from the "field" to "headquarters"; it can also be from "field" to "field," making the system software control problem different. Not, however, changing or enhancing the question of DDP.

Actually, attempts to define DDP in terms of software, both telecommunications and otherwise, have probably provided the major false starts in the definition derby.

They overlook what has happened. historically, that DDP is not the brainstorm of DP but was quickly shelved by DP when mainframe worship was at its height. The fact that previous DDP may have been non-DP does not detract from this observation.

Had the mini mainframes come first, DDP would be the order of the day and, no doubt, the untapped potential of centralized systems would

(Continued on Page 32)

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Course for Non-DPer

NEW YORK — "It's no disgrace to be confused by data processing. Most people are," according to a brochure outlining a three-day course, Fundamentals of DP for the Non-Data Processing Executive, being offered by the American Management Associations (AMA).

Course leaders will be drawn from the AMA, industry and academia. Fundamentals will be presented in November twice in New York and in San Francisco, Cincinnati and St. Petersburg, Fla; in December in Boston, Albuquerque, N.M., and Chicago; and in January in New York, Denver, San Francisco and New Orleans.

More information about the $545 course ($475 for AMA members) is available from the Associations, 135 W. 50th St., New York, N.Y. 10020.

Honeywell Adds CPE Support

(Continued from Page 29)

recommendations for improvements within existing resources and, finally, recommendations for system upgrades if they seem appropriate. The basic cost of CSPS is $12,000 plus expenses for the Soms team.

Building on CSPS-type work, the Periodic Management Reports (PMR) service is intended for the user who requires CPE on an ongoing basis. Data is collected on a weekly basis, again with both hardware and software monitors, and users get a weekly report of system performance.

Monthly and year-to-date reports summarize the weekly data and present trend analyses; they also give figures on average utilization by resource, peak resource utilization and identification of areas requiring more detailed study.

Reports are geared to general management, with data and conclusions presented in graphic form whenever possible. In addition, the year-to-date report includes a summary highlighting performance features and elaborating on the trend analyses, the spokesman said.

PMR costs $500/mo for a one-year minimum, plus expenses and a one-time fee of $500 for installation of a user-purchased hardware monitor, all in addition to "the basic study cost" — not otherwise defined.

The third Soms offering, a specialized User Consultation (UC), is intended for the user of the smaller system or one faced with a known performance problem. Honeywell lets the user determine the support desired.

This can include training in the use of a hardware monitor, help in desigining a performance study or assistance in the performance of a study, possibly using Soms software packages, according to the spokesman.

UC service costs $500/day plus expenses for Honeywell personnel.

Facility Aids VM/CMS

(Continued from Page 29)

in IMS data bases to be used in QBE operations. Queries may access QBE by a PL/I Call or an APL Shared Variable, the company said: the system is not accessible from Cobol programs, the spokesman added.

While QBE supports access to either private or shared data, or both, it also permits the user to specify various levels of security and control against unauthorized intrusions, he continued.

The brochure from IBM indicates 10 types of "queries," more precisely interactive activities, that appear to provide all the facilities of the "language" from actual inquiries to file updates and changes of authorization of access.

As an IUP, QBE is made available "as is" with little support from IBM. It costs $325/mo, a fee that is waived after a year, but also requires — in addition to VM/CMS — IBM's PL/I Optimizer Transient Library (for $28/mo) and the VM Basic System Extensions (for $125/mo).

PROBLEM:

Many customers form their first impression of your company by phone. Busy signals can hurt your sales. A client who has to spend a long time waiting on "hold," or who gets cut off, might go to your competition.

Your phone system may also be making it more difficult for your staff to communicate with each other. Dialing and re-dialing busy numbers or waiting for a clear outside line wastes valuable time.

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DDP a Question of Business, Not DP Priorities

(Continued from Page 30)

be the topic of multiple seminars and papers.

The option of distributing or centralizing processing is, in fact, merely one more tool in the overall design of an integrated corporate information processing strategy.

We have a situation in which one new (or very old) question has been added to the system design process. This process now constitutes the following steps:

- Analyzing corporate data requirements (of both mechanized and nonmechanized data).
- Analyzing corporate user requirements.
- Constructing proper data structures.
- Selecting optimal software.

The new question is 'where should a user requirement or set of user requirements be processed?" When that question is answered, the physical residence for the data structures needed to support processing falls out.

Field vs. Headquarters

This is, of course, the logical corollary of the "field"/"headquarters" (or "remote"/"central" in DP jargon) relationship mentioned above.

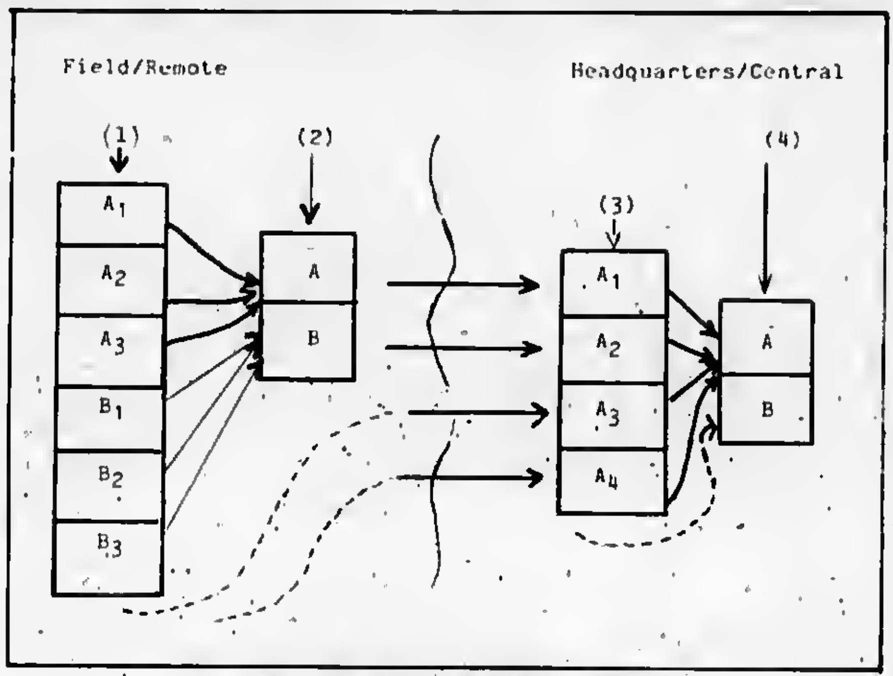
A simple distinction between "field" and "headquarters" data usage should be made here and then we can illustrate the conventional business situation showing file structure (and level of detail) being determined by the situation itself, i.e., how requirements determine the eventual distribution of processing.

Field or remote sites, when such a distinction from a central site exists in a firm, are characteristically involved in both creating and consuming data; they perform data entry and produce (or have the necessary data to produce) end-user reports.

Their end-user reports offer a finer level of detail than that required by central sites. If they do not, we are in the situation of producing redundant reports or posting from one site to another, a time vs. computing/transmission capability trade-off.

However, the most conventional situation is for headquarters to be a consumer of field data in an aggregate form that is, at a grosser level of detail than the field requires.

The accompanying figure illustrates how this practice works. Transactions (A¹, A², B¹, etc.;) enter the system in a conventional manner from cards or terminals, for example. The transactions are organized into a file (1) which can then be displayed by or retrieved from individual transaction, printed sequentially and summarized by transaction code(s).



Aggregation at Multiple Sites

When, typically, a summarization is of interest to both the field and central site, a transaction record of the summarization or aggregation is created for the field end-user (2) and at the same time transmitted or saved for transmission to the central site (3).

Upon receipt at the central site, the processing described above is then repeated with the difference that the remote's aggregate is now the central site's detailed transaction with the same availability for summarization (4), listing, display and so forth.

Along with the obvious placement of data near its end user at the appropriate level of detail, we have significantly reduced the amount of transmission involved (from [2] to [3] by modeling our data structures on an information requirement situation, rather than developing transmission conventions and content separately.

We have, therefore, illustrated a simple DDP structure with two end-user locations. Its hierarchical appearance reflects conventional practice rather than a mandatory approach.

More importantly, our structure has not been determined by a vendor-imposed DDP system nor is it the result of satisfying a set of conditions determined by an industry task force.

Although it might be implemented with off-the-shelf software and/or meet a set of arbitrary tests, the actual impetus for the distribution is the fact that the information problem itself had a distributed information requirement.

Our approach to that requirement corresponds to the above analysis steps with the addition of "Where shall it be done?" This is a question to which providing the answer is a corporate responsibility, not one to be met by outside formulas.

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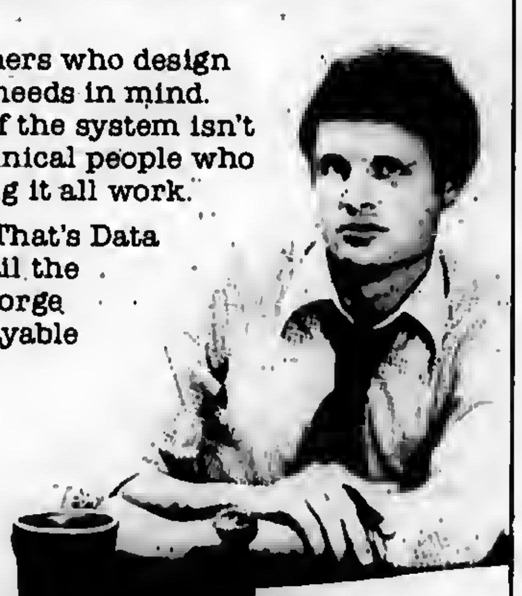

Service Eyes Performance Of Investment Portfolios

CUPERTINO, Calif. — Banks, investment advisors and other financial institutions can access fund performance and current stock analysis data through an on-line time-sharing, service recently introduced by Tymshare, Inc.

The Performance/Valuation (Perval) system was designed for fund measurement and analysis and can produce, on demand, several types of reports and evaluations, according to a spokesman. Transaction registers, audit and broker reports, portfolio valuations and performance summaries are available on a monthly basis.

The system also has a transactions audit capability that allows users to check the accuracy of transactions against the firm's Tymquote, a data base of more than 31,000 securities, the spokesman added.

For further evaluation, Perval prepares a security profile that itemizes amounts and values of assets held within a composite fund identified by fund code and lists securities by type and stocks by industry groups.

A diversified portfolio valuation, also included, contains reports on the current market values of portfolios and the percent of total value, gain or loss, annual income, yield and price/-earnings ratio, the spokesman continued.

The system also produces quarterly fund summaries; equity and bond analyses; consolidated, netted-out reports; schedules of purchase and sales; reports on brokerage commissions; and purchase and sales analyses.

Further information on the on-line money management service can be obtained from Tymshare at 20705 Valley Green Drive, Cupertino, Calif. 95014.

'Auto-System' Detailed For Wang Users

SPRINGFIELD, Va. — Users with Wang Laboratories, Inc. 2200 or WCS equipment can gain the primary benefit of a data base management system — data independence — through use of the Auto-System software, and a user's manual on the system is now available from the National Technical Information Service (NTIS), a spokesman said.

The announcement of the manual said Auto-System is a management tool to more efficiently create and control informational data bases and available DP resources. It eliminates; for many installations, the need for trained programmers for "standard" applications.

DP professionals will still be needed to create customized and analytical software, NTIS acknowledged, but this manual is said to introduce the system to managers, programmers and operators.

Auto-System was designed to run on Wang configurations with 32K bytes of main memory and either 5M-byte Wang 2230 or 10M-byte 2260 disk subsystems.

The 118-page manual, which the service admits is "partially illegible," is distributed on microfiche. Cataloged as Item No. AD-A055 877/5WC, it costs $3 from NTIS at 5285 Port Royal Road, Springfield, Va. 22161.

Package Tracks Serial Numbers

DAYTON, Ohio — Software for wholesalers of products which require control records by serial number — such as major appliances, auto parts or firearms — is now available from NCR Corp.

NCR's Wholesale Distribution System features interactive DP with all information entered through a CRT terminal linked to an NCR I-8230 system. The user is led by prompting messages on the screen and data, once validated, is used to update files immediately, an NCR spokesman said.

In addition to easing the data entry operation, the package also supports the wholesaler or distributor making inquiries into the files to determine such things as the inventory level of selected items or status of customer orders or accounts, he continued.

The serial number subsystem produces reports that show when and from whom the item was received and when and to whom the item was sold, according to the spokesman. The system also includes order processing, accounts receivable, inventory control and sales analysis systems, he added.

This package can be used in conjunction with NCR's other interactive applications.

The software uses a 64K-byte or larger I-8230 with a 9.8M-byte disk system, a line printer and a CRT terminal. Written in ANS Cobol 74, it costs $6,250.

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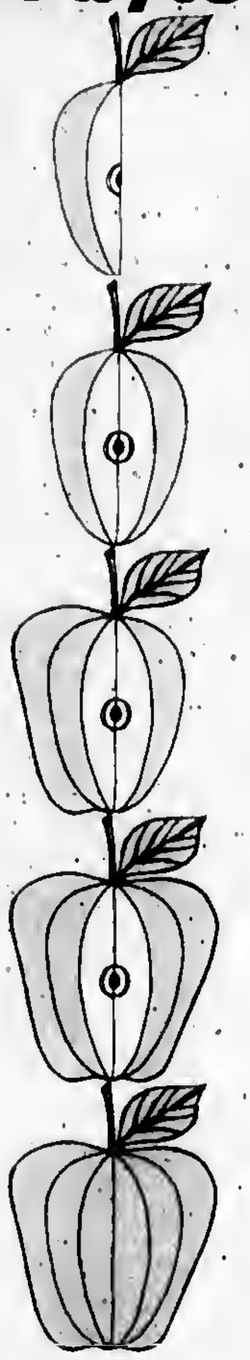

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IBM 1401 Programs Put on 3031

BROADVIEW, Ill. – When Mike O'Brien learned delivery of an IBM 3031 CPU had been moved up from March 1980 to September 1978, he began to scramble. The 3031 has no emulation for IBM 1401 programs, and O'Brien was running nearly 90 of them – to do key management of sales and inventory – on a 370/148.

As data center manager for the Amphenol Division of Bunker-Ramo Corp. here in Broadview, O'Brien was faced with two choices: reprogram the applications in Cobol while the 1401 programs lay idle or acquire a simulator software package to act as an interface while orderly reprogramming took place. "We really didn't have any choice," he said. "We put up SIM-14 from Dearborn Computer Co. to emulate our 1401 programs."

"We were well aware of the lack of 1400 support," software manager Bob Phillips added. "And we were on schedule with our conversion of those programs to Cobol. We planned to be converted by the time the 3031 was installed and running. But when delivery was stepped up, our situation became critical.

"As things go, the programs that hadn't yet been converted were some of the most important ones – jobs we just couldn't shut down."

"Installation of the package required some JCL changes for our 3M-byte system, but nothing major," Stan Peremsky, programming manager, said.

Multiuser Operating System Built for Z80, 8080, 8085

ORANGE, Calif. – A multiuser small business operating system for Z80, 8080 and 8085 microcomputers features an extended Basic language processor and a comprehensive file management system, according to its vendor, Panatec, Inc.

Pana/Basic's software capabilities include an interactive data entry and control function; relative, sequential and indexed sequential files; and various string-handling facilities. It also has a queued operational feature that allows I/O functions to continue while long-running programs operate in the background, a spokesman noted.

The operating system's file-handling capabilities are structured along 1974 Ansi Cobol specifications and include sequential, relative, indexed and consecutive access modes. Dynamic access is also included to allow one or more users to access the same file in more than one access mode, the spokesman continued.

The sytem reportedly handles multiple user accesses and automatically protects files during updates.

Four data formats are available within the Pana/Basic system: decimal, extended precision decimal, binary integer and string. Decimal accuracy is up to 15 digits in the extended precision mode, the spokesman claimed.

Pana/Basic costs an initial fee of $10,000 per installation plus royalities. It ranges in price from $120,000 to $150,000 for a one-time licensing agreement.

The company is also planning to introduce an Intel 8086 version of the software at the end of this year, it said from 1527 Orangewood Ave., Orange, Calif. 92668.

Facility Supports IMS Proclibs

OAK BROOK, Ill. – Described as a support facility for use in an IBM IMS data base mangement environment, the IMS-Proc/Analysis package is now available from Chicago Data Systems, Inc.

The package extracts information from the user's Procedure Library and provides both a cross-reference by real program name – "not DFSRRCOO" – and a cross-reference of Program Status Blocks (PSB) or Data Base Descriptors (DBD), a spokesman explained.

Additional features are said to include a formatted Proc listing wth symbolic resolution, a data set cross-reference including CATLG and volume table of contents (Vtoc) information, a program (PGM=) and a step-within-program cross-reference and a SYSOUT CLASS=FORM # cross-reference.

Syntax checking is also provided, the spokesman added.

The package is distributed in source code (ANS Cobol) with installation instructions and other doeumentation. It costs $3,000 and can be ordered from the vendor at Suite 150, 2805 Butterfield Road, Oak Brook, Ill. 60521.

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Setting Up Single Net

Diversified User Facing Consolidation

By Ronald A. Frank
CW Staff

HONOLULU — When a diversified conglomerate has many communications applications, each of which was developed independently, it becomes a problem to incorporate them into one network.

CW Photo by R. Frank

Francis Natori, manager of planning and standards at Dillingham Corp., adjusts GA SPC 16/40 used for 3780 emulation.

That is one of the major problems facing Francis Natori, manager of planning and standards in the information services department of Dillingham Corp.

Dillingham maintains its major DP center here, and as in many other companies, the data communications facilities grew as applications expanded on a piecemeal basis.

The DP center has several communications links with the mainland but some of these transmit data to Computab, Inc., a service bureau which now handles much of the company's DP work.

Beginning late this year, Dillingham will upgrade its present IBM 370/138 to a Model 148 as part of an overall plan to bring various DP operations in-house in a single system.

Part of this consolidation plan will include reconfiguration of the communications applications, Natori explained. All data transmitted to the DP center now is being handled by dual Integrated Communications Adapter (ICA) ports on the 138. With the installation of the 148, it will be necessary to get a 3704 front end from IBM to handle the same traffic plus other applications.

There are now two remote job entry (RJE) lines coming into Honolulu from Dillingham affiliate companies in the mainland. One of these uses Power/VS and transmits to the in-house DP center. The other transmits to Computab using Hasp on the 370/155 installed there.

Time-Sharing Net

In addition, Dillingham uses the GE time-sharing network, which it accesses in Los Angeles using a General Automation, Inc. SP-16/40, which emulates a 3780 terminal both for input to the network and for input to the 138, Natori explained.

For accessing data at Computab, Dillingham uses three Burroughs TC 1700 terminals, which are interfaced to the 155. In

(Continued on Page 36)

Decoding, CRT Control Logic Combined in Terminal's Chip

RANDOLPH, N.J. — An intelligent CRT terminal with character decoding and CRT control logic combined in one LSI chip is available from Perkin-Elmer Corp.'s Terminals Division.

The Bantam terminal offers an upper and lower case character set, a 24-line-by-80-char. display with 7-by-10-char. matrix, self-diagnostic capabilities, cursor addressing and ASR 33 compatibility via the RS-232C interface.

Eleven asynchronous transmission rates are externally selectable from 110- to 9,600 bit/sec, Perkin-Elmer added. The Bantam is reportedly "the only CRT in its class to offer a transparent mode with displayable control characters to simplify host program debugging."

The Bantam's display can be switched from white on black to black on white and is set deep in the hood to reduce glare, a spokesman said. The desktop unit weighs 28 lb and measures 15 in. by 19 in. by 14 in.

Options include a "full overstrike APL model," a range of foreign language character sets, a Perkin-Elmer Pussycat page printer, a current loop interface and an RS-232C printer port.

A single Bantam costs $966, and 100-unit quantities cost $599 per unit, the vendor said from Randolph Park West, Rt. 10 & Emery Ave., Randolph, N.J. 07801.

Codex 6000 Line Gains Modem And Smart Network Processor

NEWTON, Mass. — Codex Corp. has added a smart network processor and two-wire, full-duplex modem to its 6000 Series of communications products.

The Model 6010 intelligent network processor (INP) can serve point-to-point networks, the vendor said, and can directly attach to a single port on a communications front-end processor or work as a feeder to a Codex 6030/6040 network.

The dual microprocessor-controlled INP combines information from up to 30 asynchronous devices using "proven" statistical concentration techniques and thus reduces requirements for multiple lines and related data communications equipment, the firm said.

All data is error-protected through the use of a CCITT X.25 Level 2-compatible, full-duplex link protocol, Codex noted, adding that on-line diagnostic routines are executed as a background function to enhance unit integrity.

As with other Series 6000 INPs, the Model 6010 allows centralized network control and monitoring, the vendor declared.

The product can reportedly be used with a variety of terminal types in either a dedicated or dial-up environment at data rates up to 1,200 bit/sec and link speeds up to 9,600 bit/sec. EIA RS-232C, current loop and MIL-STD-188C terminal port modules are available.

LSI 24/24 Modem

The Codex LSI 24/24 modem permits 2,400 bit/sec operation in a full-duplex mode on two-wire dial or dedicated lines.

The modem allows upgrade of networks operating with 1,200 bit/sec, full-duplex, two-wire modems such as the Bell Model 212. When used with full-duplex protocols such as Synchronous Data Link Control, High-Level Data Link Control and Burroughs Data Link Control, the units allows dial applications over satellite circuits without loss of throughput.

When used with a high-speed modem featuring a built-in multiplexer, the LSI 24/24 can cut network costs by providing dial-up, full-duplex 2,400 bit/sec tail circuits, the vendor added.

(Continued on Page 37)

Pacific Telecommunications Meet Scheduled for Honolulu in January

HONOLULU — The first Pacific Telecommunications Conference (PTC 79) is scheduled to be held here Jan. 8-9.

Appearing as keynote speaker will be H. Rex Lee, a former Federal Communications Commission member who is now chairman of the Public Service Satellite Corp. and has previously served as governor of American Samoa.

Topics to be discussed at the conference whose theme is "Telecommunications in the Pacific," include international data networks, packet switching, satellite systems, electronic mail, electronic funds transfer and similar issues of interest to users in government and business.

PTC 79 is being organized by the Department of Electrical Engineering and Social Science Research Institute at the University of Hawaii in Manoa. The conference is being sponsored by the IEEE Communications Society, the Department of Planning and Economic Development for Hawaii and the Hawaii Telecommunications Association.

Among sessions to be held at the meeting are a panel discussion on transborder data transmission, chaired by William Fishman of the National Telecommunications and Information Administration (NTIA); telecommunications and government policy, chaired by Donald Sayer of IBM; and technological innovation in telecommunications.

The program will follow two paths, one designed for those concerned with telecommunications technology and a second dealing with the economic, social and regulatory aspects of communications.

The conference will be held at the Ilikai Hotel and the registration fee is $100. Details are available from Dr. Richard J. Barber, director of the Hawaii Research Center for Futures Study, University of Hawaii, 2424 Maile Way No. 704, Honolulu, Hawaii 96822.

Qantex Unveils RS-232 Interface

HAUPPAUGE, N.Y. — An intelligent RS-232 interface that links Qantex data storage systems to RS-232-compatible communications channels and CPU ports has been announced by the Qantex division of North Atlantic Industries, Inc.

The Model 86-686 features a Motorola, Inc. 6802 microprocessor and permits automatic execution of search and edit functions as well as rereading and rewriting of memory upon detection of read/-write errors, the vendor stated. The interface reportedly handles continuous data transmission, switches between data rates from 55 bit/sec to 9,600 bit/sec, and supports up to four independent cartridge tape transports.

The unit costs $900, Qantex said from 60 Plant Ave., Hauppauge, N.Y. 11787.

Columbia Adds Buffer

BALTIMORE — Columbia Data Products, Inc. has introduced a microprocessor-controlled, solid-state Data Buffer for storing up to 16,000 characters.

The unit was designed to connect asynchronous RS-232 or teletypewriter-compatible terminals with a modem or CPU for store-and-forward applications.

Dual universal asynchronous receiver transmitters reportedly allow on-line speed conversion; speeds from 110- to 19.2k bit/sec are selectable.

Standard features include search and edit, auto-answer, answer-back, line mode, transparency mode, automatic line feed and self-contained diagnostics.

The Data Buffer costs $995 from Columbia at 6655 Amberton Drive, Baltimore, Md. 21227.

Diversified User Planning To Consolidate Operations

(Continued from Page 35)

addition, a System/3 Model 10 in Seattle utilizes Hasp to transmit data through a communications adapter to the service bureau.

In all, about 50 Dillingham divisions send data to Hawaii in one form or another for processing. This includes financial reporting, payroll and a vessel costing system for the Foss Launch & Tug Co. maritime division.

Expansion Necessary

The two 4,800 bit/sec lines coming into Hawaii will need to be expanded when all applications are consolidated on the 148, Natori said. These links are now tied into a tandem tie line system in Los Angeles for both voice and data traffic.

The company now has six IBM System/34s on order, which Natori said will be installed at subsidiaries to act as preprocessors or remote front ends to the 148, which will be operating under VM/370. The 34s were ordered because delivery of systems involves a waiting period, Natori explained, but he said he may ultimately decide on another processor to perform the remote front-end functions.

A possibility is the IBM 8100, but no decision has been made yet.

The communications upgrade is a second phase of the consolidation effort at Dillingham and it may include an implementation of IBM's Synchronous Data Link Control (SDLC), Natori explained.

The present private lines might be augmented with a public data service such as Telenet if that fits in with the communications needs, he said.

A consultant is making some recommendations about where to put the DP/data communications operation. In the meantime, Natori is taking things one step at a time.

"First we have to bring everything in-house, then we'll see what the next step is," he said.

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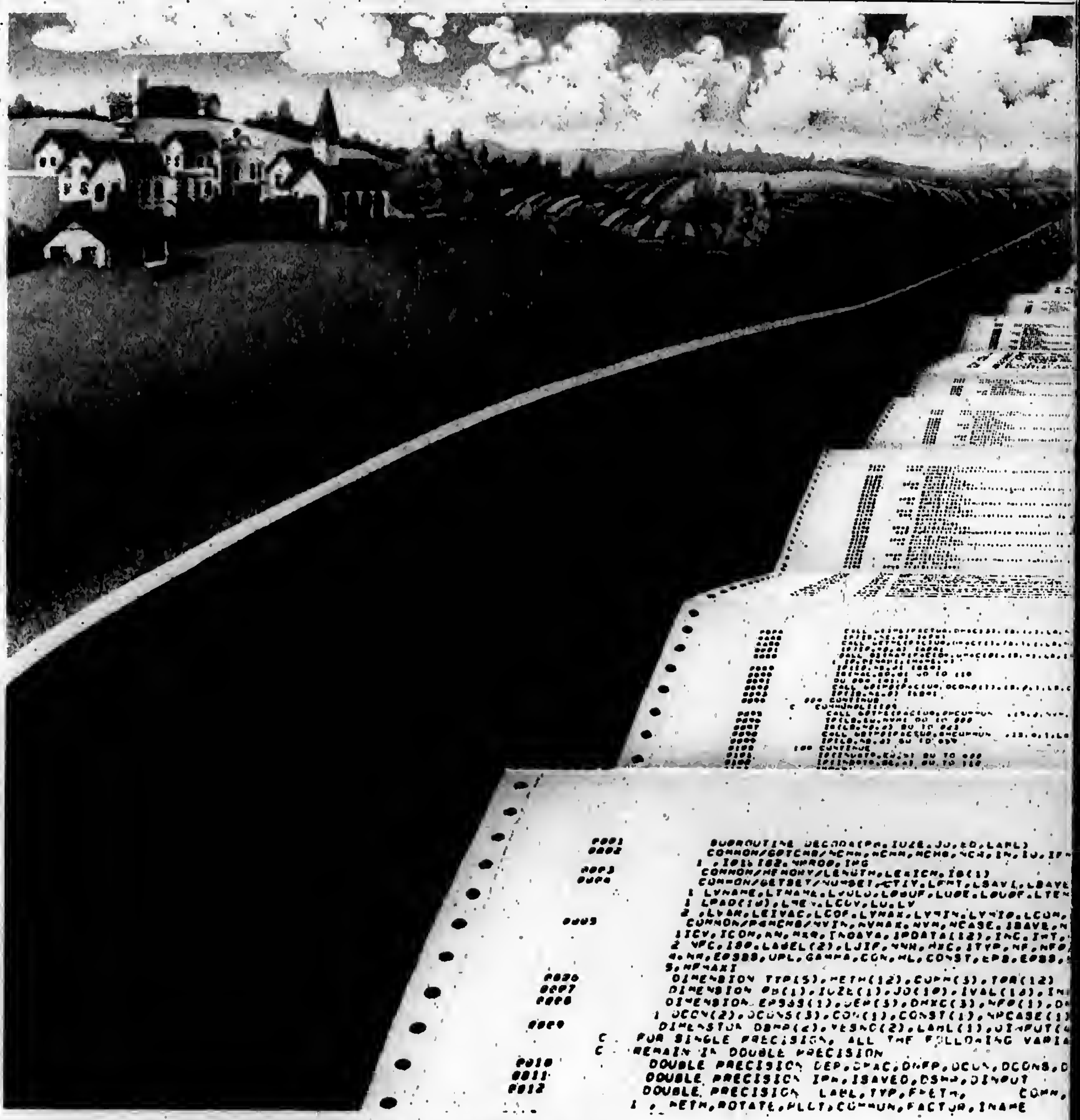

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Sperry Rand Using Bell's EPSCS in Private Net

BEDMINSTER, N.J. — Sperry Rand Corp. has recently incorporated Bell's Enhanced Private Switched Communications Services (EPSCS) in its private-line network, joining about 38,000 telephones at 220 locations throughout the U.S. and Canada.

Sperry's in-house network — Sperrynet — uses EPSCS to "automatically" redirect telephone calls along "the most economical route available" in the event a primary path is busy. Other accessible EPSCS services are tie-lines, Wats and Foreign Exchange.

In addition, Sperry users are provided "up-to-the-minute" status reports on phone traffic within the network and may use that information to reconfigure for "special calling situations," the firm stated.

With EPSCS, Sperry is said to gain an unprecedented level of control over its diverse telecommunications activities. For example, a customer network control center at the New York City corporate headquarters allows continual monitoring of traffic flow and rapid identification and resolution of any traffic problems, as well as detailed reports of network use.

"We studied the situation for four years," Bornheimer recalled. "We knew our tandem tie network had just about reached its limit in usefulness, so we were looking for a system that would give us improved service, greater flexibility and reduced corporate expense. Bell's new electronic switching service had what we were looking for."

Sperrynet will be linked to specially equipped Bell switching centers in Atlanta; Philadelphia; St. Paul, Minn.; and Los Angeles. The entire network will be maintained and supported by Bell's administrative control center in Chicago.

Sperry is the fourth company to use EPSCS, a Bell source noted. The other users are Xerox Corp., RCA and Mobil Corp.

Indiana U. Seeks Papers

BLOOMINGTON, Ind. — Indiana University has issued a call for papers for its sixth annual Computer Network Conference on Academic Computing Applications to be held April 6.

Titles and abstracts of papers should be submitted by Jan. 1 for peer review and selection, the university said. Completed papers that are selected, along with a 75-word autobiographical "sketch," are due Feb. 15.

The conference will include presentations in nontechnical as well as technical areas of academic computing and vendors are invited to demonstrate new products.

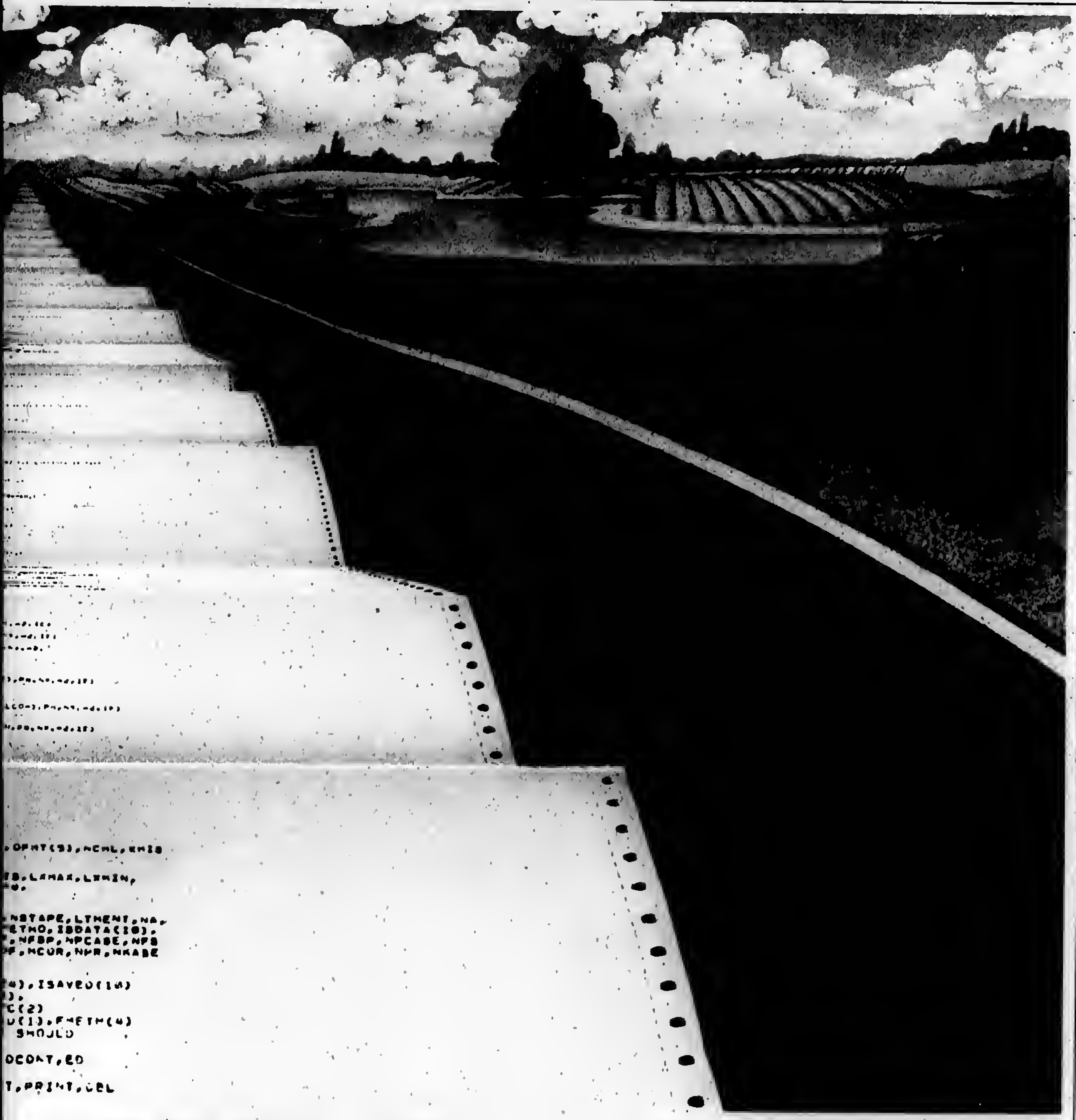
The university's Computer Network Operations Advisory Committee expressed particular interest in papers on dedicated computer applications. Abstracts should be sent to Mickey Stentz, Wrubel Computing Center, Memorial Hall West 015, Indiana University, Bloomington, Ind. 47401.

Codex Adds To 6000 Line

(Continued from Page 35)

The modem can complement voice digitizers and can surpass the throughput of 4,800 bit/sec half-duplex modems when used in dial applications with half-duplex protocols — depending on message block characteristics, . transmission delay and line turnaround.

The Model 6010 INP costs $4,250; associated dual-channel modules cost $325. The LSI 24/24 modem costs $4,760 or may be leased at $130/mo, $110/mo or $105/mo for one-, two- or three-year terms, respectively, Codex said from 15 Riverdale Ave., Newton, Mass. 02195.



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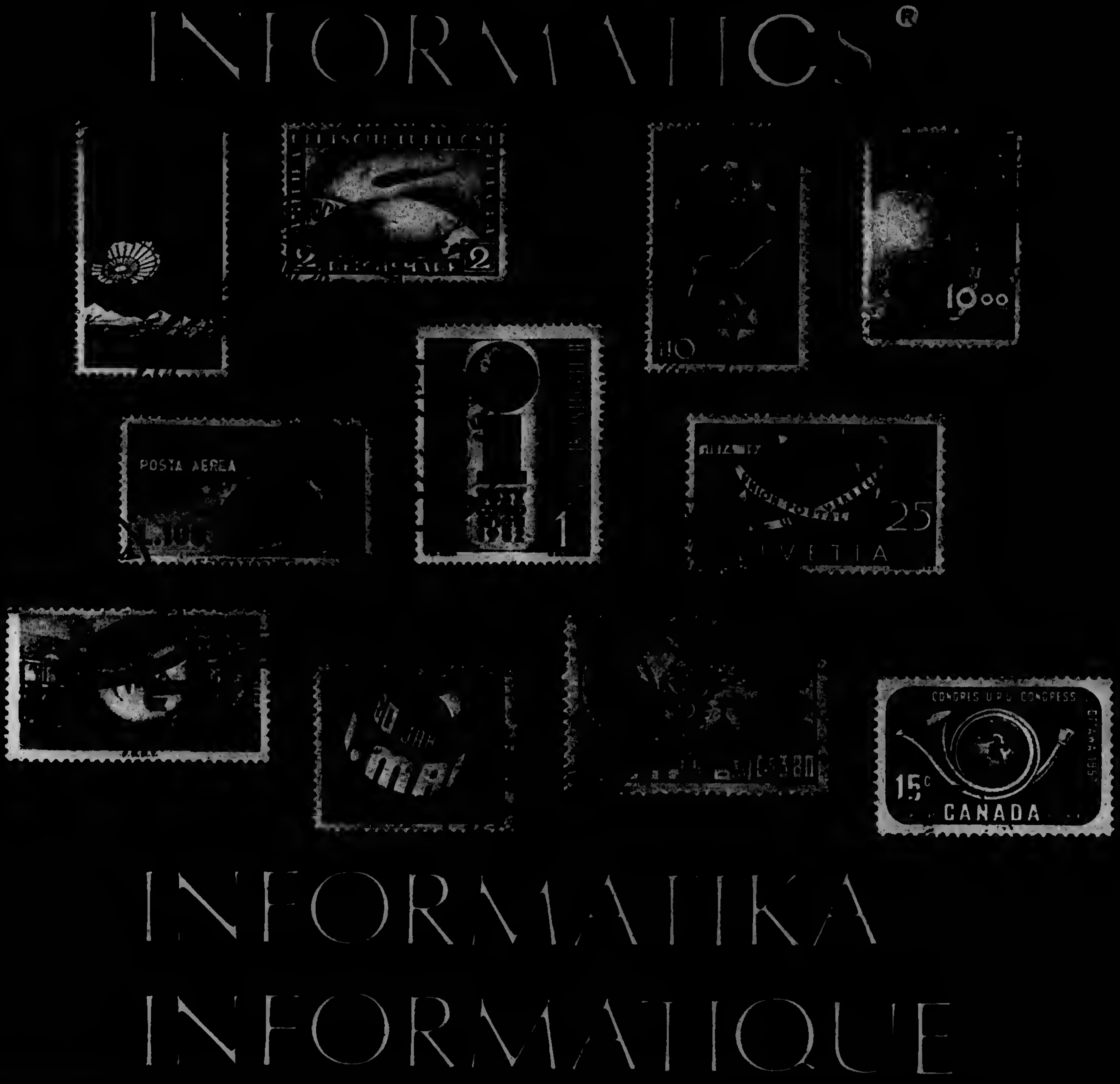

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EIA Bypass Device Also Debuts

Switch for DEC Users Among Four From IDS

LINCOLN, R.I. — A selector switch for Digital Equipment Corp. Word System 78 users, an EIA bypass switch, a telephone line crossover switch and an analog A-B selector switch/monitor have been unveiled by International Data Sciences, Inc.

The Model 8556-D A-B selector switch allows two Word System 78s to share a printer. The 50-pin unit allows the operator to manually switch pins 3 through 50 of any two 50-wire inputs into a 50-wire output.

All connections are made at the rear panel through three 50-pin female connectors, a spokesman said.

A two-position rotary switch on the unit's front panel allows the operator to switch any 50-wire input from the rear panel connector — labeled "C" — to either of the two connectors labeled "A" and "B," the vendor stated.

The Model 8538-D EIA bypass switch allows operators to switch a terminal chained off-line into the EIA interface, according to the spokesman.

This unit features a two-position switch mounted on the front panel that permits a chained terminal to be on-line or bypassed, he explained, adding that the entire EIA 25-pin interface is switched.

Crossover Switch

The Model 8540-D telephone line crossover switch allows the operator to manually reverse the two- or four-wire connection between two modems and two telephone lines.

The device offers a two-position switch on the front panel that lets the operator place the unit in either normal or reverse modes, the spokesman said. A chaining function permits a single modem or telephone line to support several other modems or telephone lines.

The Model 8917 analog A-B selector switch/monitor contains the switching and paralleling monitor functions for four independent data channels at the four-wire, full-duplex modem-telephone line interface.

This unit operates in concert with the Model 8967 controller and power module, IDS said. Up to eight Model 8917s are housed within a single Model 8967 in the vendor's Model 8903 cage assembly.

The entire 32-channel system in turn mounts in the standard 19-in. cabinet of a technical control center. Remote control of the entire system is accomplished via IDS' Series 8900R remote control system.

Bulk switching of up to eight Model 8917s is accomplished by means of a Master A-B switch on the Model 8967 and individual channels are switched by an A-B switch on each Model 8917.

The Model 8556-D, 8538-D, 8540-D and 8917 cost $250, $290, $165 and $575, respectively, IDS said from 7 Wellington Road, Lincoln, R.I. 02865.

Modems Built For Satellite Nets

BOHEMIA, N.Y. — A series of single-channel-per-carrier modems from American Modem Corp. consists of companion transmitter and receiver units: the Model 1463T encoder/modulator and the Model 1463R demodulator/decoder.

The Series 1463 QPSK modems were designed for satellite communications networks where the transponder is power-limited because of a large number of single channels.

For Point-to-Point Service

The Series 1463 modems are suitable for use in point-to-point dedicated service and incorporate solid-state integrated circuits for maximum reliability and low power consumption, a spokesman said. Error-correcting encoding and decoding is featured.

Standard interfaces available with the Series 1463 modems are V35, WE302 and RS-232 (or V24). Other interfaces are offered on request.

The series' transmitter unit costs $2,800 and the receiver unit costs $4,915, the vendor said from 160 Wilbur Place, Bohemia, N.Y. 11716.

Correction

Motorola, Inc., not Motorola Semiconductor Products, Inc., owns the Government Electronics Division at 8201 E. McDowell Road, Scottsdale, Ariz. 85252 as reported in "Motorola Extends DES Key Management" [CW, Oct. 2].

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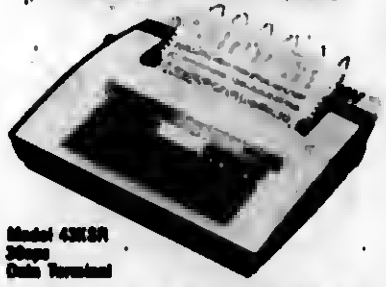

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For a brochure giving full details of the conference and its list of speakers, contact Online Conferences Ltd. C/o The Wayne Smith Company, Suite 810, 500 12th.Str.SW, Washington DC 20024. Tel: (202) 484 5620.

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Processor Helps Develop Transaction-Based Coding

NEW YORK — Decision Strategy Corp. calls its Taps Transaction Processor (TTP) for distributed DP "a complete environment for developing transaction-based applications."

Users build transactions interactively from a CRT terminal and need only code for logical comparisons and computations," the vendor said. The processor provides data security, menus, editing, temporary data storage, data collection, network and data base recovery, data paging, documentation and terminal operator control.

TTP interfaces to any communications monitor or provides its own. In addition, it reportedly fits all terminal types.

Functions Without User Code

The device is said to allow addition, modification, deletion and search of data without any user code — "any complex or boolean question can be asked from the CRT" — and retrieval is based on "customizable" English language "aliases" for each data element.

The results of an inquiry can be displayed on a standard screen format or the terminal operator can use the Decision Strategy Real-Time Report Writer to design another screen format "on the fly," the vendor explained.

Totally Reentrant

TTP is "totally reentrant" and is said to minimize line loads and multiple tasks. The featured inverted file structure reportedly maximizes throughput.

Decision Strategy termed the TTP transaction code "90+% portable among IBM mainframes" and the following minicomputers: the Digital Equipment Corp. PDP-11; the Hewlett-Packard Co. 3000 series; Interdata, Inc. Model 32s; Tandem Computers, Inc. minis; and IBM Series/1s.

The TTP costs $25,000 and up, with discounts for multiple sites. Decision Strategy is at 708 Third Ave., New York, N.Y. 10017.

Modem Runs Full-Duplex At Distances to 50 Miles

WHEELING, Ill. — The Gandalf Data, Inc. Model LDM 404B limited-distance modem was designed for full-duplex synchronous communications at 4,800 bit/sec at distances to 50 miles.

The LDM 404B operates over 4-wire, voice-grade Bell 3002 lines — conditioned or unconditioned — as well as T Carrier and most other carrier systems, Gandalf said.

The modem's transmitter uses quaternary amplitude modulation followed by frequency translation to a narrow band centered in the voice channel, the firm continued, noting that the receiver employs delay equalization with digital filtering techniques.

Installation is said to require no special tools or test equipment and alignment is performed with a built-in meter that performs self-checking.

The interface meets RS-232C and CCITT V.24 requirements, Gandalf added, and a stand-alone or rack-mounted version is offered.

The LDM 404B modem costs $1,200, the firm said from 1019 S. Noel, Wheeling, Ill. 60090.

Data Transfers Speeded With Paper Tape Emulator

MIDDLETOWN, Conn. — A microprocessor-controlled paper tape emulator that uses magnetic tape cassettes to accelerate data transfer has been announced by Raymond Engineering, Inc.'s Raycorder Products Division.

The Model 6801 operates with either a single or dual Raycorder digital cassette transport and is directly compatible with conventional paper tape systems, the vendor said.

Communications is via a serial asynchronous interface that conforms to EIA Standard RS-232C, Raycorder said, adding this design assures simplicity of operation and commonality with existing paper tape reader and punch equipment.

Transfer Rate

The data transfer rate is selectable in eight speeds from 110 to 9,600 bit/sec. Operating modes include local, on-line and off-line, and manually operated controls and visual indicators allow the user to select basic functions.

Electronically programmable read-only memory software is available.

The dual transport paper tape emulator costs $2,995, Raycorder said from 217 Smith St., Middletown, Conn. 06457.

Device Tests Phone Lines

LOS ANGELES — Teleprocessing Products Co.'s TP-260 data line tester reportedly allows testing of both dedicated and dial-up telephone lines and gives a quick indication of suitability for transmission.

Tests can be performed by "unskilled persons" with results read directly in terms of tariffed requirements for data lines, the firm claimed.

A combination 1,004-Hz tone generator, audio receiver and decibel meter are included to diagnose common phone line problems, the firm continued, adding that the TP-260 is about twice the size of a transistor radio.

The device costs $260 off the shelf, Teleprocessing Products said from 11163 W. Pico Blvd., Los Angeles, Calif. 90064.

Former IBM Site

First User Calls Omega 480 'Just Super'

By Howard A. Karten
CW Staff

DETROIT — The Omega 480 is "just super," according to one of its first users, who is pleased with both the system's performance and the software support he has gotten so far from the mainframe's vendor, Control Data Corp.

"Since we installed the system in March of this year" — it was announced by CDC 18 months ago [CW, May 23, 1977] — "it's been virtually maintenance-free. We have not had a single problem with the CPU itself, and the Omega just runs and runs and runs," according to Jim Glutting, assistant DP manager of Transco Corp. here.

Transco, which ships 2,000 to 4,000 cars every day from manufacturers to auto dealers around the country, relies heavily on its system for all phases of this operation. With that kind of volume — and no backup computer — it can't afford lengthy delays.

"The only problem we had with the system was losing the time-of-day clock, and that happened because the local controller for one of the CRTs was running in burst mode, instead of in byte mode, so it wasn't really an Omega problem," Glutting recounted.

Several Alternatives

Before installing the Omega, Transco had been using an IBM 370/125, which was overloaded. To alleviate this problem, it considered several alternatives: a larger IBM system, an IBM-compatible system made by Itel Corp. or the Omega. When contractual difficulties developed with Itel and the best delivery date IBM could offer was 18 months off, Transco finally opted for the Omega, designed and manufactured by IPL systems, Inc. of Waltham, Mass..

Transco's original plan had been to bring in a Model 1 Omega system, then upgrade it about September to a Model 2. However, the upgrade kit was not available at the time, and since the arrangement of terms with CDC was favorable and the idea of a backup was attractive, Transco decided to put the Model 2 with its older brother, instead of simply replacing it.

Glutting is particularly pleased with the software support from CDC. "The software support that I've gotten isn't even comparable to IBM. There were three or four fixes that I wanted to put into the operating system that were not supported by IBM. I told CDC about it, and the next day it came out here with a fix," he recalled.

"IBM provides no direct support," Glutting continued. "Once you lose your CPU, you lose your support. There were a lot of things I wanted to do that weren't allowed the way IBM software was set up.

"For example, with Release 34 of DOS/VS, IBM dropped all Isam support for 3330 Model 11s and 3350 [disk drives]. We had 25 Isam files we wanted to use, and of course IBM's answer was to convert them to Vsam. I didn't want to do that, so I told CDC about it, and the next day it came out with a fix, which is running today."

One unusual aspect of Transco's installation concerns preventive maintenance. Although a CDC spokesman said the company recommends preventive maintenance being done once a month for two hours (with more detailed maintenance performed quarterly, semiannually and annually), Glutting said he has had no preventive maintenance performed thus far.

The Omega Model 1 used by the company has 1M byte of memory. The newer one has 2M bytes. Both run under DOS/VS using

(Continued on Page 42)

Two 370-Compatible Systems Unveiled by California Group

By E. Drake Lundell Jr.
CW Staff

NORTHRIDGE, Calif. — A group of minicomputer designers has gotten together here and designed replacements for two IBM mainframes that reportedly promise increased performance at "significantly" reduced prices.

Unfortunately, however, end-user marketing plans for the Computer Information Technology Engineering Laboratories Corp. (Citel) systems are not completely formed at this time.

The first two models of the Citel 30 series — the models 3 and 4.— will initially be available as replacements for the IBM 370/138 and 370/148. The firm said it will eventually offer systems that cover the complete range of IBM Series 30 products.

The present systems run the IBM OS/VS1, OS/VS2, DOS/VS, VM370 and MVS operating systems, according to Donald R. Wilshe, Citel president.

The units can contain up to 16M bytes of 300 nsec dynamic MOS memory, Wilshe said, and feature a processor cycle time of 100 nsec. They use a multiple bus structure with 32-bit-wide paths to provide a data flow rate of up to 2G bit/sec internally.

Presently the logic circuitry is T^2L but Citel will use emitter-coupled logic on its larger machines in order to increase the speed by six to eight times, Wilshe said.

All processor functions are controlled by reloadable control storage and the units feature 16 general-purpose and floating point registers.

In addition to the 370 instruction set, the Citel 30 machines have extended precision floating point, an interval timer, store-and-fetch protect, a byte-oriented operand feature, instruction retry, dynamic address translation, compare-and-swap, compare-and-swap double, extended control mode, program event recording, time-of-day clock with clock comparator, multiprocessor capability, remote diagnostics and an integrated logic/test analyzer as standard features.

The Citel systems implement IBM's Extended Control Program Storage in microcode, Wilshe said, and feature a 64-bit, 500 nsec multiply and hardware-assisted divide feature.

Five Channels Standard

Five channels are standard on each system — one byte multiplexer and four block multiplexers, each with a data rate of up to 3M byte/sec.

Expected end-user price of the system will be about $460,000 for a Model 3 with 1M byte of memory and about $650,000 for a Model 4 with 2M bytes of main memory.

Most of the designers for the systems came from Hodge and Taylor Associates and have done computer architecture design work for many of the minicomputer manufacturers, including Computer Automation, General Automation, Varian, Interdata and Microdata, according to Wilshe.

All members of the engineering design team are stockholders in the venture.

The equipment is being manufactured by Instrumentation Technology Systems, another backer of the firm.

Initial deliveries of the systems will be "early" in 1979. Wilshe said Citel is looking for large-volume distributors with their own service and sales networks to sell and service the product, but he did not rule out direct marketing by Citel.

Citel presently has commitments from several third-party maintenance firms to handle the upkeep on the systems if Citel decides on direct marketing. Furthermore, Wilshe claimed lease money is already lined up if the systems are sold directly.

Although the systems use a 4-bit slice-based architecture, Wilshe said they are not minicomputers and would be good for multiprocessor applications. The systems are available with interfaces for both minicomputer-type peripherals and IBM 370-compatible peripherals, he added.

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Storage Hierarchy Trends — Part 2

Systems — Not Devices — Stressed for Future

By George Rose
Special to CW

For a number of reasons, the on-line storage hierarchy for large computer systems has continued to expand for the last 10 years. Semiconductor storage has replaced core storage, main storage has increased in size and speed, magnetics has undergone refinements and various solid-state developments have been occurring.

Magnetic recording did not stand still while solid-state improvements were taking place. Although moving-head disk technology is more mature, progress has been substantial and should continue.

Performance improvements have been made in all areas — faster head movement, increased rotational speed and multiplexed data transfer.

However, the most dramatic and consistent advance has been made in recording density, which increases both data transfer rate and device storage capacity. The areal density has increased from 50,000 bit/sq. in. in the IBM 1311 disk to 3 million bit/sq. in. in the IBM 3350.

Range of Alternatives

Figure 1 depicts the trend of density increases in IBM moving-head disk products over time. This trend has resulted in a breadth of moving-head disk devices in large data centers, which can typically range from 100M bytes to 800M bytes in storage capacity. Devices with a capacity of 1G byte may be available within the next few years.

In effect, a storage hierarchy of moving-head disks exists within the total storage hierarchy with lower capacity, higher performance at one end and, at the other end, large capacity and lower performance. With this range of alternatives, the fixed media mode of operation has become feasible in many data centers, even when some of the media are removable.

With the increase in rigid-disk areal density, a decrease of more than one order of magnitude in the cost of disk storage capacity has occurred in slightly more than a decade, as illustrated in Figure 2. Reductions in storage cost are tied to density increases and are expected to continue in the future.

Mass Storage

Moving-head disk technology can presently satisfy capacity requirements in excess of 1,010 bytes for large data centers. When the on-line capacity requirement is about 1,011 bytes, products commonly termed "mass storage" are available.

Although mass storage products are not new — Ampex Corp.'s Terabit was developed in the 1970s — their use on IBM systems did not receive broad attention until IBM announced the 3850 mass storage system in 1974.

Freed from the restriction to be compatible with conventional magnetic tape, higher recording densities were achieved and the on-line hierarchy was expanded.

The IBM system — and others — rely on magnetics for data storage. However, the organization of mass storage involves a departure from the usual peripheral approach.

Within these systems, the storage and retrieval of data are largely independent of how application programs process the data.

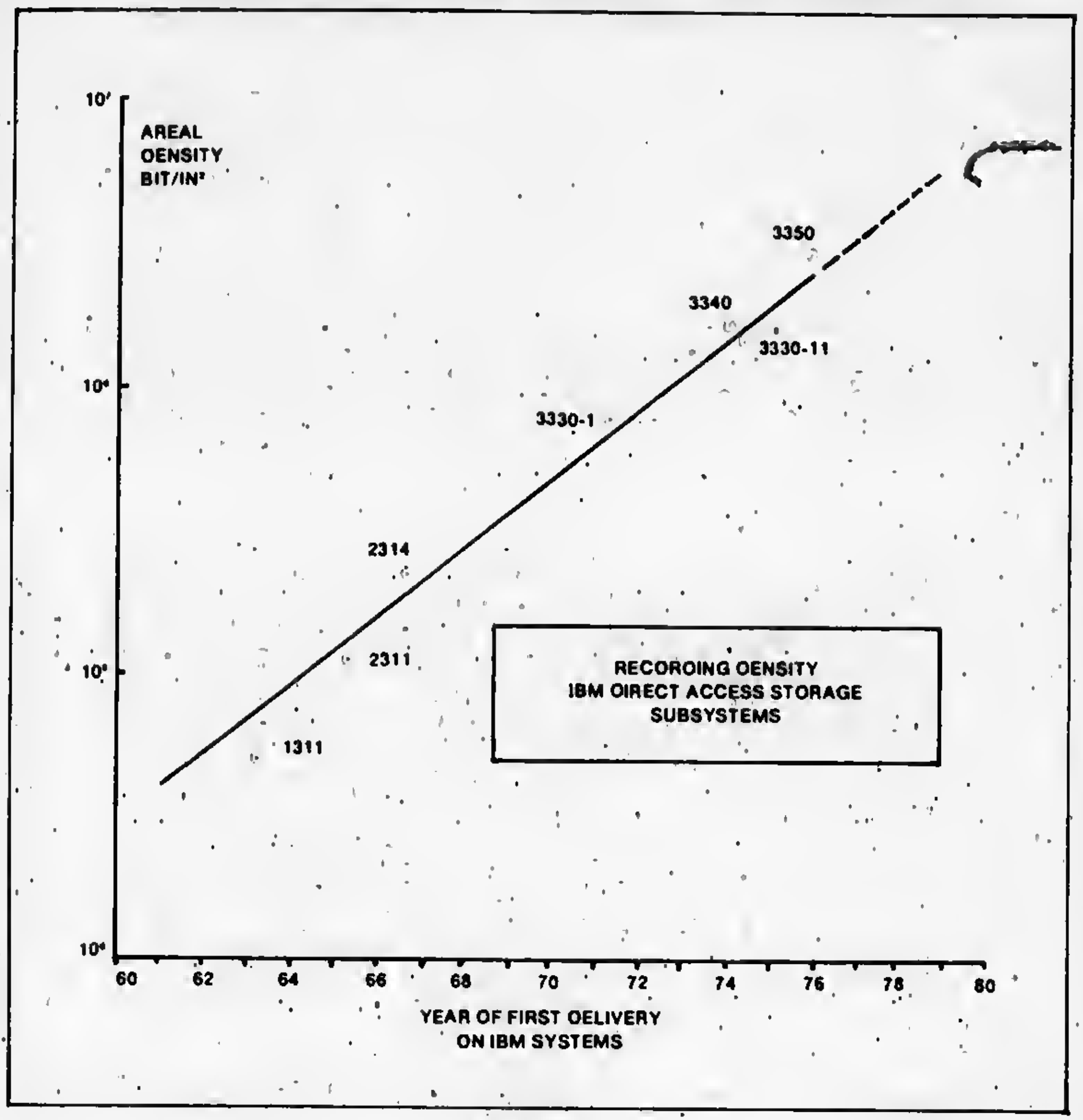

Figure 1

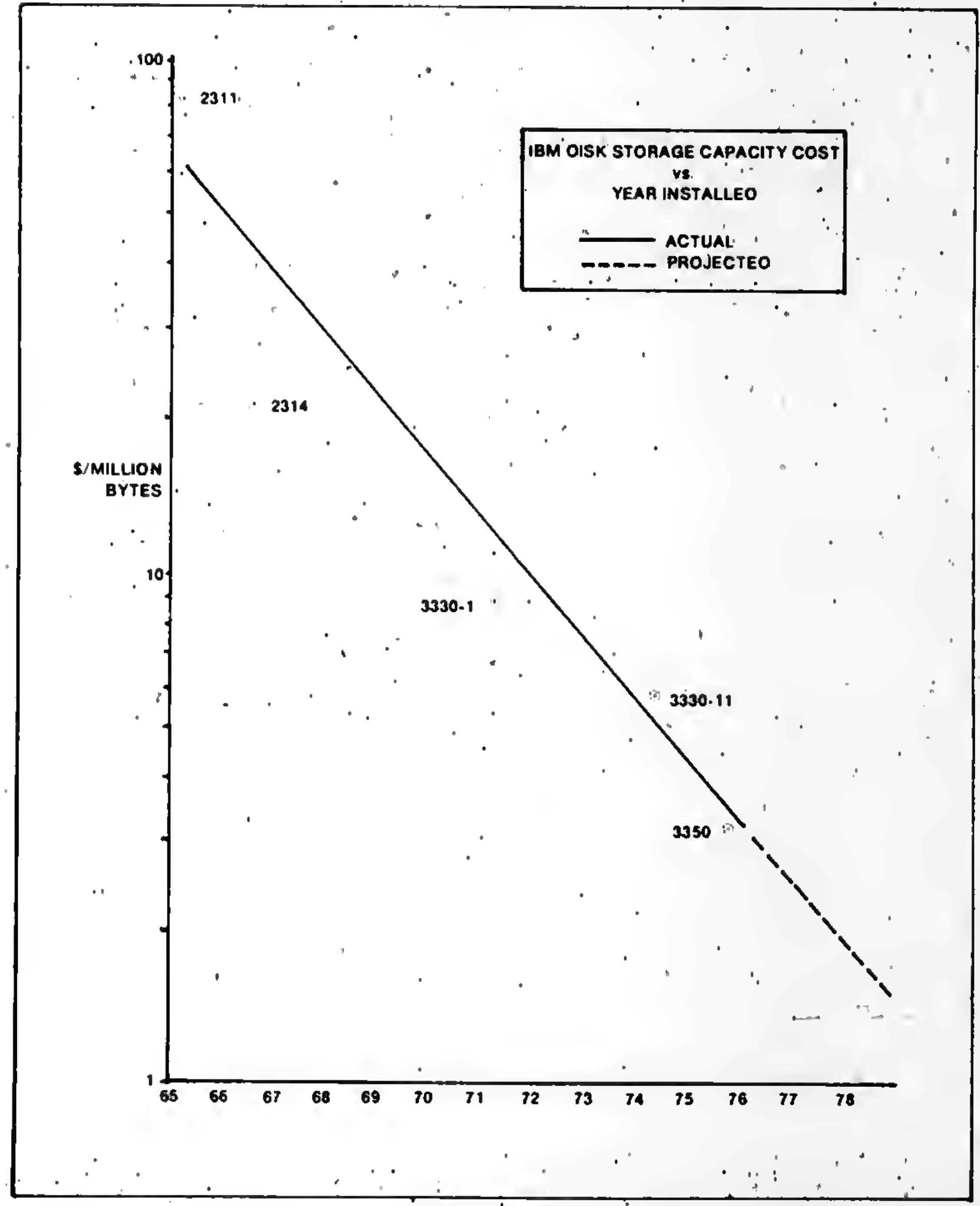

Figure 2

Assisted by the flexibility of microcode and writable control storage, IBM introduced a sophisticated level of outboard intelligence in its mass storage system.

Hierarchical Control

A number of software products have also become available to manage data in the hierarchy. As the hierachy grows in size and the levels within the hierarchy increase, automated control becomes an important goal.

Advances in solid-state technology can help to make the overhead cost of such control reasonable and justifiable. One can envision the introduction of microprocessor and cache developments at appropriate levels to present the appearance of a more homogeneous, total data storage facility.

The increasing price/performance effectiveness of solid-state logic is nearly as dramatic as that of solid-state memory, and it should do for control of the hierarchy what memory has done for data storage. A reduction in human intervention and external software control should correspondingly evolve.

These trends are associated with fundamental questions relative to the storage and processing of data in large system environments. The concepts of centralized and distributed processing, or combinations thereof, are subjects which involve analysis of where data is stored and processed.

Increasingly, the evaluation of data storage alternatives will shift from emphasis on devices to emphasis on systems which can support the management and movement of data within a hierarchy and within a network of hierarchies.

Rose is a senior member of the Information Systems Staff at Western Electric Co. in Greensboro, N.C.

Omega 480 Called 'Super'

(Continued from Page 41)

Power VS and Task/Master from Turnkey Systems, Inc.

When the Model 2 is turned over to the company for use, Glutting plans to share direct access storage devices between the two systems.

Humans Still Important

Despite the user's heavy reliance on DP for keeping track of its business, it still relies heavily on human beings in the area of load-makeup, which involves deciding what mix of cars to load on an auto carrier.

A wide mix of vehicle sizes and heights, tire sizes, bumper configurations and other factors determine which vehicles can be shipped together, Glutting explained. Breaking this data down into rules usable by a computer would be highly complex, Glutting noted. As a result, the task is done manually.

"The guy who does this has been doing it for 20 years, so he's pretty good at it by now," Glutting commented.

In summarizing Transco's experience with the Omega system, Glutting mentioned the "security blanket" aspect of staying with IBM. "We felt we were slighted by IBM because we were a smaller account, and we felt we really didn't get the support and service we should have had.

"IBM is a security blanket for a lot of people but, frankly, I can't see what security [potential converts] are leaving. For example, the software support was zero, compared to what we have now," he said.

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Hitachi M-200H Seen Largest, Fastest CPU

By Howard A. Karten
CW Staff

TOKYO — Hitachi Ltd., the Japanese computer maker, claims its M-200H will be the world's largest, fastest general-purpose computer, according to a recent issue of *EDP Japan Report* (EDP/JR).

Scheduled to be introduced in Japan in mid-1979 [CW, Sept. 18], the system is said to be 60% to 70% more powerful than IBM's 3033, the biweekly newsletter reported, as well as 10% faster than Fujitsu's M-200.

And, although Japanese computer manufacturers do not market their products in the U.S., the system might nevertheless be coming to this country. Itel Corp. is reportedly planning to develop a new high end of its Advanced System series which will be based on the M-200H.

With a main storage capacity ranging from 4M to 16M bytes — or twice as much as an IBM 3033 uniprocessor — the Hitachi system will rent for $158,000 monthly (at present rates of exchange) when first shipments begin in the second half of 1979, according to EDP/JR.

The system, which uses NMOS, 16K bit/chip technology for storage, can be used in multiprocessor configurations with up to four processors connected.

NEC Introduction

Another Japanese manufacturer, Nippon Electric Co. (NEC), also recently introduced a large, fast system, the Acos 900 Model 2. This system — actually two enhanced Acos 900 Model 1 systems in a multiprocessor configuration — reportedly has a processing capacity of 11.2 million instruction/sec (Mips) vs. 12.8 Mips reported for the Hitachi unit.

Like the Hitachi system, the NEC unit can have from 4M bytes to 16M bytes per CPU and uses 16K bit/chip NMOS architecture.

However, the NEC unit has an average instruction execution time, using the Gibson-mix-method of estimating, of 89.3 nsec (for a multiprocessor configuration) vs. a figure of 78 nsec for the M-200H.

Rental Fee

The Acos system will rent for about $110,000/mo, EDP/JR reported, when deliveries commence shortly. At about the same time, Fujitsu Ltd. is expected to begin shipments of its M-200, with the first going to Kyoto University here.

In addition to the large-scale mainframes, a mass-storage system developed jointly by Fujitsu and Hitachi, the H-8523, is being marketed by Hitachi. Although the company has not yet officially announced the system — "for some 'political' reason," EDP/JR speculated — the Hitachi M-200H product catalog identified that storage system as having four models, with capacities ranging from 35G to 216G bytes.

The H-8523 is compatible with IBM's 3850 mass storage system, the report said, and will be officially announced in April jointly by Fujitsu, Hitachi, Nippon Peripheral Ltd. (NPL), NEC, Toshiba and NTT.

Overseas Deliveries

Overseas deliveries of the system are slated to begin in the second half of 1979, but it will not be marketed in the U.S., following Japanese custom.

In addition to the 3850-compatible system, the above group is also reported to be developing a medium-sized mass storage system with Mastore Corp., a recently formed California company. Initial deliveries of that system are scheduled for the first quarter of 1980.

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Impact of IBM's 30 Series

Changes for Users Seen in Third-Party Market

By Howard A. Karten
CW Staff

TROY, Mich. — The introduction of IBM 30 Series systems has meant that users can expect new levels of price/-performance in the third-party marketplace, according to CMI Corp., which is heavily involved in this market.

The company's *Third-Party Market Newsletter* for September noted that supply exceeds demand for 360 systems, with CPUs generally selling for approximately 10% of IBM list. The bottom-end 360/20s are still in demand as small, stand-alone systems, the firm added.

Supply is ample for 370/125s, 135s and 145s, the company noted, with the market for the latter two systems stable. By contrast, the supply of 138s, 148s and 168s is limited, with the latter in particularly short supply.

The ample supply of the three smaller systems, as well as the 155, has forced prices down to 30% to 35% of IBM list, while the more limited supply of other systems — such as the 158, 168, 138 and 148 — has resulted in prices ranging from 60% to 80% of list.

An older 155 with dynamic address translation feature would be an "excellent price/-performer" as a 148 alternative, according to the report, while the same system without that feature would be priced right for 360 users.

Conditions in the I/O market are essentially unchanged, the report continued, with demand for tape and disk continuing strong as installations grow in size. It is often more difficult to obtain an I/O controller than a CPU, the report stressed.

Supplies of 3000 series disk and tape drives are limited, resulting in prices of 50% to 60% of list for the disks and 70% to 85% of list for the tapes. By contrast, the older 2000 series tapes and disks are in ample and limited supply, respectively, with prices forced down to roughly 20% of list on both. However, limited supplies of both 1400 and 2000 series card equipment have kept the prices up to IBM list on both series, CMI said.

There is little activity in the System/3 market, the report noted. Most models of the system are in ample supply.

System/32s are selling for 65% to 75% of list, while limited supplies of System/34s have resulted in those systems usually selling for the full IBM list price.

Calling the System 3 Model 15 "the best price/performer" in that line, the newsletter noted that those systems generally bring 75% to 85% of IBM list. The most economical buy in the System 3 line is the Model 10, which typically sells for only 30% to 50% of list, CMI said.

In addition to the activity in the System/3 CPU market, I/O gear for the systems is in limited supply, bringing 70% to 80% of original list, the report indicated.

"As the volume of business increases and new products are announced, we are amazed at the seemingly insatiable appetite for computer power," the report concluded. CMI can be reached at 755 W. Big Beaver Road, Troy, Mich. 48084

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Univac Uses Univac to Manage Parts Inventory

ELK GROVE VILLAGE, Ill. — Univac has, not surprisingly, turned to a Univac computer complex to manage an inventory of 77,000 spare parts valued at $35 million.

Besides the bread-and-butter inventory applications, which involve shipping 3,600 orders a day from the 230,000 sq.-ft Worldwide Distribution Center (WDC) here, the computer system is really helpful in emergency situations, Univac said.

For example, on Sunday, March 5, this year, an automobile careened out of control on an expressway in the Oak Brook area, about 17 miles west of downtown Chicago. The car jumped the curb and plowed into a transformer, resulting in a power loss in the immediate area.

One of the many buildings affected by the accident was Computer Sciences Corp.'s (CSC) computer complex, one of the links in CSC's nationwide network of service centers. All six of the Univac mainframes in the center were immediately knocked out.

Power Supplies Needed

While power was being restored, 13 different types of power supplies were needed to get the computers operational again.

A call for the power supplies was sent to the WDC by the Mount Prospect Univac Customer Engineering branch in Arlington Heights, which is responsible for servicing CSC.

WDC had 11 of the required power supplies on hand and, to save time, had one of its own staff deliver the components to the customer site rather than wait for the material to be picked up.

After the initial delivery of the 11 items, four of the 1108 systems were restored to service in less than three hours after the power loss.

One of the remaining two power supplies needed was soon located at another field location, and arrangements were made for immediate shipping to the customer site. The last supply was obtained from a manufacturing location.

Responding to "fire alarms" of this type is an ordinary occurrence — scarcely a week goes by without an emergency call being received in the center to help a customer faced with an unexpected problem "stay on the air." And often the emergency occurs on a weekend or holiday.

But the more normal part of the business is managing Univac's worldwide inventory, valued at more than $125 million.

The focal point of the distribution network control is the Univac Worldwide Support Material organization, headquartered at WDC and headed by A.A. Wimmell.

A number of depot distribution centers backup the facility here. These include the European Distribution Center in Sassenheim, The Netherlands, with an inventory valued at about $6 million and the capability of supplying 75% of European emergency requirements.

Other depots are in Irvine and Los Angeles, Calif., Houston and Voorhees Township, N.J. In addition, about 1,500 smaller customer engineering warehouses and storerooms are maintained by Univac throughout the world.

Speeding Up Delivery

"We are using advanced material-handling techniques at all of our major locations to expedite the flow of parts to our customers. We recognize the mounting costs and inconveniences caused to our clients, the longer equipment downtime lasts," Wimmell said.

The Worldwide Support Material Center locations are chosen on the basis of their service and transportation facilities.

To replenish its stocks, WDC receives replacements from manufacturing plants in Roseville, Minn., Salt Lake City, Utah, Bristol, Tenn., and Cupertino and Irvine, Calif., as well as from its own repair services activity and a variety of vendors.

Two computers, a Univac 1108 and an 1110 system, are used for the distribution and inventory control system. The 1108 is the hub of a Material Control System (MCS) which provides for automatic replenishment of stocks to customer engineering field branches and subsidiaries worldwide.

The 1110 system is used for the spare parts distribution system and processes in-house parts movements, updates inventory records, controls ordering and depot replenishment, produces shipping documents and records warehouse transactions. If needed, the 1108 system can act as a backup to the 1110 processor.

One of the functions of the Elk Grove facility is the distribution of Field Change Order (FCO) materials, which include kits of modification materials and engineering instructions.

Orders are received from offices throughout the world by telephone, Telex and computer input, depending on the urgency required.

The center is also responsible for providing all of the documentation needed for export. This is a sizeable task considering the varying paperwork requirements of the different countries for the importation of computer parts.

A feature of the Elk Grove Center is the Parts Repair Center and a repair development laboratory which researches the best methods to repair components returned from customers. The report diagnostics are concentrated on detecting faults in printed circuit boards.

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Mini Helps Unclog Paperwork Bottleneck

BOSTON — Rapid growth was multiplying Brewster Wallcovering Co.'s paperwork volume and complicating management of its day-to-day operations until the wallcovering distributor automated its business functions with its first inhouse minicomputer system.

Today, Brewster has reportedly trimmed its paperwork requirements and tightened control over such vital business functions as inventory control and accounts receivable, and company vice-president Robert Holzman traced these benefits at least in part to the recently acquired mini.

Built around a Microdata Corp. Reality minicomputer with three printers and four CRT terminals, the system helps Brewster manage its billing and shipping, generate credit reports, control inventory and process orders, Holzman said.

Before Brewster installed its current system, the company performed these applications manually with the help of an online service bureau.

Under the previous system, transactions were first recorded for invoicing and prebilled by an on-line terminal. One problem with that system was that a customer phoning in five or 10 orders a week would receive five to 10 separate invoices a week, one for each order.

As soon as an order was recorded, a shipping notice was then sent to the warehouse by pneumatic tube to allow warehouse personnel to begin assembling, packaging and shipping the order to its customer.

Records of such transactions had several other important uses. They became part of the customer's statement, of the company's overall accounts receivable report and of the company's sales report.

With Brewster's rapid growth during the last five years, accurate, up-to-date reports for both inventory control and accounts receivable became difficult to maintain, especially with more than 10,000 items in inventory and more than 2,000 active customers, many of whom were dealt with daily.

When Brewster realized its continuing expansion would eventually necessitate

(Continued on Page 50)

Four Firms Get Top Marks in User Poll

DELRAN, N.J. — Basic/Four Corp., Digital Scientific Corp., IBM and Prime Computer, Inc. have achieved a higher level of overall customer satisfaction than any other vendors in the minicomputer sector, according to Datapro Research Corp.'s most recent survey of mini and small business systems users.

On a scale of one to four — with four representing the highest score and one the lowest — users gave the Digital Scientific small systems line an overall performance rating of 3.4 and the Basic/Four, IBM and Prime families a score of 3.3.

A few vendors like Digital Equipment Corp. and Data General Corp. earned even higher marks for individual offerings like the Datasystem 500 series and the Eclipse C/330. But no minicomputer firms elicited as consistently high a level of user satisfaction throughout an entire product line as Basic/Four, Digital Scientific, IBM and Prime, the survey results indicated.

Datapro traced its findings to a 1977 survey in which the firm asked an estimated 10,000 minicomputer users to rate their systems according to 12 key criteria: ease of operation, mainframe reliability, peripherals reliability, responsiveness of maintenance, effectiveness of maintenance, technical support, operating system, compilers and assemblers, applications programs, ease of programming, ease of conversion and overall satisfaction.

More than 800 users — representing 30 vendors and more than 60 system models — responded to the survey and, following Datapro's instructions, used a rating of four to denote "excellent" performance, three for "good," two for "fair" and one for "poor."

For each category, Datapro then added the users' ratings and divided the total by the number of respondents to obtain an average performance evaluation.

As a whole, the respondents voiced a reasonable level of satisfaction with their small systems hardware, software and maintenance. Overall satisfaction among the users averaged 3.1, while ease of use and mainframe reliability, each with a 3.4 average score, garnered the highest user ratings of the 12 performance categories.

Only in two areas — technical support and applications programs, where ratings

(Continued on Page 52)

DEC Adds Smaller Version Of Packaged Micro System

By Jeffry Beeler
CW Staff

MAYNARD, Mass. — Digital Equipment Corp.'s L System line of packaged microcomputer systems recently gained a second model when the company announced a small version of the family's original member — the PDP-11T03-L, which was introduced late last May.

Designated the PDP-11V03-L, the latest L system member incorporates a PDP-11/03-L microcomputer with up to 32K bytes of MOS memory that users can supplement with up to 32K bytes of optional read-only or ultra-violet programmable read-only memory, according to a DEC spokesman. The system also incorporates one of the minicomputer manufacturer's recently announced RX02 dual-density floppy diskette units, which accommodates a maximum of 1.2M bytes.

The PDP-11T03-L, by contrast, expands to as much as 64K bytes of MOS memory and supports an RL01 dual-disk subsystem that holds 5.2M bytes per disk, the spokesman noted.

In processing power, however, the two L System models are almost identical because they use the same processor and extended Fortran instruction set.

Although DEC intends its latest packaged system primarily for OEMs, the product also suits end users that plan to do most or

(Continued on Page 52)

DEC's PDP-11V03-L

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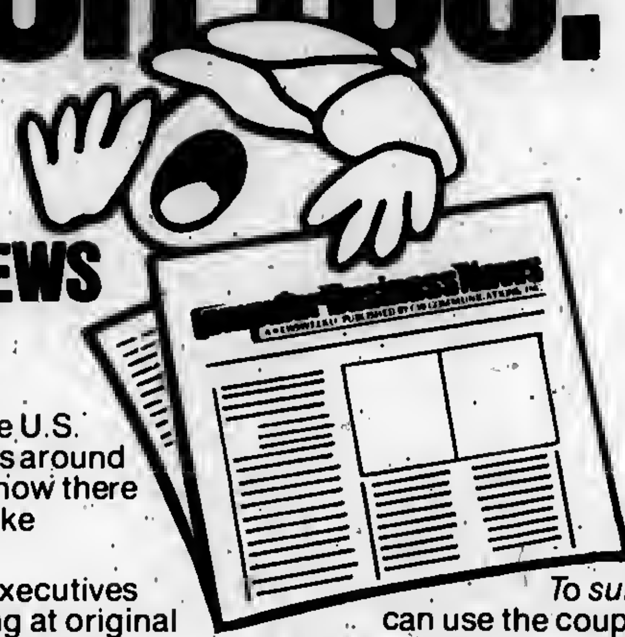

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Small Multiuser System Saves Broker $20,000/Year

By Marcy Rosenberg
CW Staff

MINNEAPOLIS — By adding a multiuser small business system to automate accounting procedures, a reduced commissions brokerage firm "saved between $20,000 and $50,000 a year in what could have been service bureau or increased labor costs," according to Joe Krammer, president of Thrift Trading.

Krammer's firm uses a Wang Laboratories, Inc. 2200 MVP multiuser small business system with four CRT terminals; each performing two functions at the same time, Krammer said.

With a multiuser system, he noted, "I can have one terminal processing orders, another listing out various debits and credits and a third doing transfer forms or checks."

Thrift Trading first automated its manual bookkeeping method a little more than a year ago when it purchased a 16K-byte Wang 2200VP processor, a Model 2226 inquiry terminal, a 10M-byte fixed/removable disk and a printer. Wang developed a turnkey Basic software package for the brokerage firm.

"We needed a software package that would allow us to make and store in the computer the 44 bookkeeping entries it usually takes to complete one transaction and then call up the information visually or in print as needed," Krammer noted.

Thrift Trading evaluated an IBM System/32 and a Lockheed Electronics Co. System III, among others, before selecting the Wang 2200VP. "The IBM prices were unreal," Krammer said, "and Lockheed didn't offer service.

"We selected the Wang system for its interactive terminals, strong Basic language and upgrade capabilities."

How easily the system could be upgraded was put to the test less than six months after it was installed when the brokerage firm decided it needed more memory and the ability to do more independent processing. To convert the system to a multiuser Wang 2200 MVP, the firm only had to modify its programs so they could be shared by more than one terminal and to train an operator in system generation.

Thrift Trading's multiuser system consists of a 64K-byte 2200MVP, one 2260B 10M-byte fixed/removable disk, a 2770 A-D triple flexible disk drive unit, four 2236D inquiry terminals, one 2221W printer at the system console and two 2281 daisywheel printers for output at the terminals.

Representing a hardware investment of almost $70,000, the 2200MVP costs the firm "just slightly more than one year's rental time at a service bureau," Krammer estimated. A service bureau usually charges for program changes and doubles its charges if the customer's volume of entries doubles, he explained.

Without its own computer for bookkeeping, Krammer's nine-employee firm "would have needed to add at least two more staff members at a cost of a couple of thousand dollars a month," he said.

The brokerage firm plans to expand its business by opening a second office in St. Paul in mid-November and possibly a third in Rochester, Minn., in December.

"We are able to add offices largely because of the computer," he said. "We couldn't have handled the increased amount of bookkeeping manually."

'Your Move, Zeb.'

PDP-11s Get Disk Controller

PALO ALTO, Calif. — A single-board disk controller for the Digital Equipment Corp. PDP-11 series cuts the cost of disk control by at least half, according to a spokesman for Minicomputer Technology, Inc., the product's developer.

Designated the SMC11, the controller links any PDP-11 to disk units from Ampex Corp., California Computer Products, Inc., Control Data Corp., Kennedy Co., Memorex Corp., Microdata Corp. and Okidata Corp. The controller also reportedly supports one or two disk units in most capacity combinations.

In addition to costing $3,500 to $8,500 less than comparable multiboard configurations, the unit saves board space by eliminating extra fans, power supplies, multiboard interconnections and cabinetry, the source said.

With one command, the SMC11 can transfer multiple sectors consisting of up to 64K words, the spokesman added. Among its other features, the controller provides hardware error correction and sector flagging during formatting and allows two CPUs to share one or more disk systems.

With flat cabling to the first disk unit, reference manual and limited one-year warranty on parts and labor, the controller costs $3,580 with OEM discounts available from the company at 2470 Embarcadero Way, Palo Alto, Calif. 94303.

Step # 2: Defining the problem

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Mini Helps Unclog User's Paperwork Jam

(Continued from Page 47)

an alternative DP system, it established several goals for this system:

- Because it would have to meet current as well as future needs, the system would have to be expandable and flexible.
- With increased volume raising its administrative costs, Brewster needed to cut the amount of recordkeeping, file maintenance and paperwork then required for its business.
- To keep pace in an increasingly competitive market, Brewster wanted to offer its customers the best service, while at the same time making such vital information as inventory control reports accessible at less cost, with greater accuracy and with a faster turnaround time.
- Brewster wanted to obtain all of the elements for this new system from one supplier so that its personnel would not have to be the intermediaries between a supplier of hardware and a provider of software.

After investigating many DP systems, Brewster decided to purchase the Microdata Corp. Reality system from Northeast Data Systems, Inc. Working with Northeast Data's personnel, Brewster stipulated its needs so that the system would be designed with all the appropriate software options to give the company the type of report flexibility it needed.

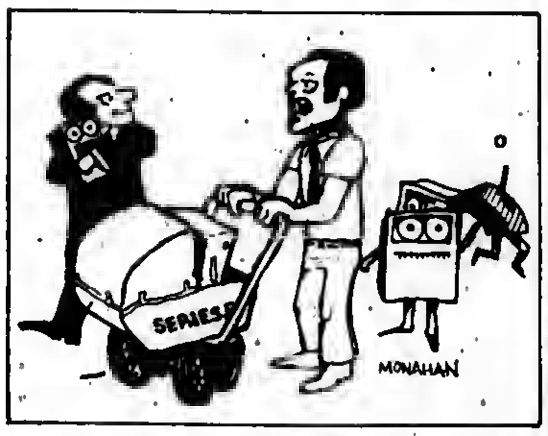
Brewster liked the idea that Northeast Data would be supplying all the system's elements including design, hardware, programming, maintenance, training and conversion assistance.

When the system was installed last May, Brewster ran it in parallel with the earlier system for two months to make sure there would be no slippage of information retrieval or of service. Then in July, the Reality system took over total operation on its own.

Present Configuration

As the system is now constituted, two of its CRT terminals are located in the main sales office and the other two in the computer room, while two of the printers also operate in the computer room and one in the warehouse.

With the system, an incoming order is immediately entered into the computer through one of the CRT terminals in the sales order department. Northeast Data designed the system so that, once entered, all the information about the transaction is available to the computer so it can handle any other business relating to that order.



'The Development Stage of Each New Generation Is Beginning to Get to Me.'

Northeast Data also placed terminals at strategic locations. Now when an order is entered in the sales office, a printer in the warehouse automatically prints a shipping order at 120 char./sec.

Thus, the warehouse is informed as soon as the order is entered and begins shipping procedures.

Northeast Data also addressed Brewster's need to decrease paperwork. Now, because all the week's transactions are part of the computer's stored memory, all billing can be done automatically by the computer at week's end. With an instruction from Brewster's personnel, the computer prints bills in the computer room at 300 line/min.

In addition to giving Brewster's customers a clear and current statement of their accounts, the system provides the latest mailing and sorting techniques. With its software options, Brewster can sort its active mailing list of customers by sales territory, by Zip Code or by any other key variable.

The system also updates inventory records and gives Brewster reports on exactly what it has in stock at any time. Moreover, it provides stock status reports, sales reports, credit reports and planning-oriented cost projections.

PDP-11/34 Gets Memory

MAYNARD, Mass. — In noncache configurations, an addition to the PDP-11/34 MOS memory line reportedly provides up to 20% greater performance than existing MOS memories for the Digital Equipment Corp. minicomputer. In cache configurations, the MS11 memory offers as much as 10% more performance.

The memory also stores up to 256K bytes on one board and uses 50% to 70% of the power required by older PDP-11/34 memories, according to a DEC spokesman.

In single quantities, the MS11 costs $4,500 and is from DEC at 146 Main St., Maynard, Mass. 01754.

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Four Cartridges Handled

CANTON, Mass. — Up to four 10M-byte disk cartridge units from Data General Corp., Pertec Computer Corp. or Diablo Systems, Inc. can reportedly be accommodated by a disk cartridge controller manufactured by Gen/Comp, Inc.

The Model 3052 also supports 315K-byte diskette units or up to four 2.5M-byte disk cartridge systems from those three suppliers.

Packaged on one 15-in. by 15-in. board, the controller is said to be media-compatible with DG, Pertec, Diablo and comparable disk drive units. The unit is also pin-compatible with the DG 4234, 6045 and 6030.

The disk cartridge controller costs $2,350, excluding an extra $150 charge for a 10-ft cable from a CPU to the first disk unit. Gen/Comp is located at 6 Algonquin Road, Canton, Mass. 02021.

Gen/Comp, Inc.'s Model 3052

Double-Height Board Has Quad-Height Unit Features

SANTA CLARA, Calif. — Features said to be usually associated only with quad-height memory boards are reportedly available with a double-height memory from National Semiconductor Corp.'s Computer Products Division.

Plug-compatible with the Digital Equipment Corp. LSI-11, LSI-11/2 and PDP-11/03, the NS11/2P memory board provides on-board parity generation and parity check circuits, external or internal refresh functions, battery backup and address-space expansion, according to a National Semi spokesman.

The NMOS random-access memory is typically configured as 32K by 18 bits and stores 128K words on one 5.187-in. by 8.43-in. by .5-in. card. To increase working storage, users can expand the memory by 28K-, 30K-, 31K- or 31.5K words by using on-board DIP switches to enable the top memory section, which is usually reserved for I/O device addresses.

NS11/2P operates with or in place of DEC's MMV11-D and -E or MSV11-D and -E series modules in the H9281, H9270 or DDV11-B backplanes. Users require no special tools or adjustments to install the unit, the firm said.

Some of the memory's operating specifications include a 250-nsec read-access, 500-nsec read-cycle, 130-nsec write per word or byte, 545-nsec write cycle and 250-nsec/byte read-modify-write (RMW) access with a 1,115-nsec RMW cycle.

Although a standard NS11/2P is configured as 32K by 18 bits, the product also comes in 32K by 16-bit versions without parity and depopulated 16K by 18-bit or 16K by 16-bit configurations, the spokesman noted.

A 16K-bit NS11/2P costs $965, compared with $1,565 for a 32K-bit configuration. National Semiconductor's Computer Products Group is located at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Floppy Disk System Stores 2.5M Bytes

MOUNTAIN VIEW, Calif. — Users can reportedly transfer 19.2k bit/sec and more to their minicomputers with a floppy disk storage system from SMS, Inc.

A spokesman for the disk controller and storage systems manufacturer credited the FT227D's data transfer rate with eliminating the transmission delays often associated with RS-232 interface-equipped floppy systems.

The SMS system stores up to 2.5M bytes on single- or double-sided IBM-compatible diskettes and permits either IBM 3740 single- or double-density recording.

A 2.5M-byte version of the product costs $4,100 from SMS at 777 E. Middlefield Road, Mountain View, Calif. 94043.

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Four Vendors in Near-Tie In Datapro Survey of Users

(Continued from Page 47)

averaged 2.6 and 2.7, respectively — did users report significant shortcomings in small business systems performance.

Among the small computer vendors, Hewlett-Packard Co., Microdata Corp., Univac and Wang Laboratories, Inc. received the highest overall user satisfaction ratings behind Basic/Four, Digital Scientific, IBM and Prime. All four second-place finishers averaged a 3.2 score for their entire small systems lines, Datapro reported.

DEC, Four-Phase Systems, Inc., Datapoint Corp. and Interdata tied for the third highest ratings, with an average mark of 3.1, while Burroughs Corp., Cincinnati Milacron, Inc. and NCR Corp. each earned a 3.0 for their overall systems performance.

Other vendors rated during the survey included DG and Honeywell, Inc., which scored 2.8 and 2.9, respectively.

Lowest Marks

Some of the survey's lowest overall marks went to Texas Instruments, Inc. with 2.6, Modular Computer Systems, Inc. (Modcomp) with 2.4 and Raytheon Data Systems Co. with 2.0.

Among individual systems, the DEC Datasystem 500 series topped the list in user satisfaction with an overall rating of 3.7 for the 12 performance categories. DG's Eclipse C/330 followed closely in second place with a 3.5 average mark, as did the Datasystem 3000 series, HP 300 series, IBM System/3 Model 8 and 360/20, Jacquard Systems, Inc. J100 and Univac (formerly Varian) 620.

Users gave the Burroughs L series, Honeywell Level 62 family and IBM System/3 models 6 and 12 an overall satisfaction rating of 3.4, while the IBM System 32, Univac 90/30 and Interdata Model 70 averaged 3.3, Datapro found. Systems rated at 3.2 included the Datapoint 1100, PDP-11/40 through -/70 models, Microdata Reality series, NCR Century 101 and Wang 2200 series.

Elsewhere in the survey, the Burroughs B 1700 series received an overall score of 3.0; the DG Nova series, 3.0; the DEC PDP-8 series, 2.8; and the NCR 8200/8250 systems, 3.0.

Differing Responses

When Datapro focused individually on each of the other 11 performance criteria, the firm often noted widely differing user responses to the same system. Some offerings apparently excelled in certain performance areas and faltered somewhat in others.

In mainframe reliability, for example, the highest user praise went to the IBM 5100, Systems Engineering Labs, Inc. small computer line and the Univac 620, all of which earned an "excellent" rating. Honeywell's Level 6 processor, with a 3.8, also ranked among the most reliable CPUs.

Processors that achieved a 3.7 rating included the Datasystems 300 and 500, HP 3000 and DG Nova 3.

In effectiveness of maintenance, IBM's 360/20 and Univac's 620 led the field with a 4.0, compared with a surveywide average of 3.0. On the other hand, the Nova 2 and 2/10, PDP-8 series and Wang 2200 series each scored .4 points lower than the average for effectiveness of maintenance.

The results of Datapro's user survey appear in a recently updated version of its feature report *All About Small Business Computers.* In addition to summarizing user evaluations of minicomputer products and services, the 70-page report includes comparison charts for 289 systems from 84 vendors.

Priced at $12, the study is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

DEC Adds Smaller Version Of Its PDP-11T03-L Micro

(Continued from Page 47)

all of their own software development, the source added. The system will typically perform standard business functions rather than laboratory or scientific applications.

The PDP-11V03 can simultaneously meet the needs of both OEMs and end users because the systems package includes DEC's basic software, the spokesman explained. Standard software includes the Version 3-B of DEC's RT-11 operating system as well as an editor, macro assembler and utilities.

Applications Programming Aids

Compared with earlier forms of RT-11, Version 3-B provides a simplified command language plus programming aids that together are said to ease development of application programs.

As options, DEC's latest L System member also offers high-level languages like Basic, Fortran IV and APL. With Fortran IV or macro assembler-developed programs, the system's extended floating-point instruction set speeds arithmetic operations by as much as threefold, he said.

Like most other packaged systems, the PDP-11V03-L comes primarily as a fixed configuration that leaves little room for alteration or expansion. Users do have a choice, however, of what terminals they wish to add to the system, the spokesman explained. Either DEC's LA36 Decwriter II printer terminal or its recently introduced VT100 CRT terminal will operate in the configuration.

As a package, the PDP-11V03-L's hardware modules cost 30% less than they would if acquired separately, the source added.

Housed in a 31-in.-tall cabinet, the system provides a built-in cooling system that reportedly permits it to operate in a typical business office without the environmental controls often associated with computer hardware.

A minimum PDP-11V03-L configuration with a 32K-byte main memory costs $10,500, compared with $18,000 for a 64K-byte system. Quantity discounts are available, and shipments will start this fall from DEC at 146 Main St., Maynard, Mass. 01754.

Self-Paced Instruction

Non-DPers Flocking to Micro Courses

By Ann Dooley
CW Staff

BERKELEY, Calif. — In an area described as a "hotbed" of microcomputer activity, interested students are flocking to a series of special courses designed to familiarize laypeople with small business systems.

The courses are being held at the Small Business Computer Center at the Peralta College for Non-Traditional Study, where Center Director Richard Bidleman admitted he never expected such an onslaught of students. "I was expecting a maximum of 100 students, but instead more than 130 signed up in the first week of the program and enrollment is now at about 200 students," he said.

The open format program, which began in September, is still attracting five to six more students a week. The reason for its popularity may be that a lot of people hear about microcomputers, but have no way of learning about them at traditional adult education facilities, Bidleman said. Peralta College is one of several "colleges without walls" located around the country.

Bidleman, who spent more than three years developing the course material, noted that many of his students are people interested in learning more about a growing trend; some are even scientists interested in using small computers in their experiments.

The largest number of students are businesspeople whose companies are using a system or about to convert to one. These people come from a wide spectrum of businesses, from insurance to construction to travel. They themselves may not be using a computer, but they are interested, nevertheless.

At least half of the students are potential purchasers of small systems, Bidleman said. Ten or 12 people already own a small computer and as many as 30 are on the verge of purchasing one.

"I tell them not to buy one immediately until they learn more about them. It's not prac-

(Continued on Page 54)

Tina Joins Adam

SUNNYVALE, Calif. — Logical Machine Corp., manufacturer of the small business computer Adam, has now introduced Tina, a desktop computer that, like Adam, utilizes the English language to help the user control the system himself and avoid prepackaged software.

Tina is packaged in three modules:

- The CRT and its detachable keyboard house the MPU and memory circuits.
- A separate medium-speed printer is standard; high-speed printer is optional.
- A dual floppy disk drive contains one disk assigned to retain the vocabulary taught to Tina by the user; the other stores the information in the files needed by the user.

The floppy disks hold 1.25M bytes of information. The file disk can be changed in the middle of a job to enhance storage capacity, the firm noted.

Tina costs $14,995 from Logical Machine Corp., 1294 Hammerwood Ave., Sunnyvale, Calif. 94086.

Floppy/CRT Controller Board Among Three From DOSC

NEW YORK — DOSC, Inc. has introduced a high-resolution graphics board, an OEM single-board computer containing both a floppy and CRT controller and an MPU board for industrial control applications.

The SVB-80 graphics board is compatible with the Intel Corp. Multibus and offers high-resolution graphics, including multilanguage character generation, according to a spokesman. It is capable of generating and displaying any character set and can intermix characters and graphics, he said.

The board features 32K of random-access memory (RAM) and a character display with programmable options of 80 characters by 40 lines or 72 characters by 44 lines. In applications where lower resolution graphics are adequate, 16K of the board's memory can be utilized as standard RAM and 16K for the display. The SVB-80 costs $895.

The TCB-85, the single-board microcomputer with resident floppy and CRT controllers, offers a CRT monitor, floppy disk, keyboard and printer. Other features include support for 16K programmable read-only memory (Prom), vectored interrupts, 48K RAM and serial I/O ports.

The board can support CP/M, a disk operating system, Basic, Cobol, Fortran, a text editor and assembler; it is priced at $1,495 per unit in quantities of 10.

The third device, the MIB-85 microprocessor board, features Prom storage and RAM storage capacity. The MIB-85 uses an Intel 8085 MPU.

The board features support for 16K or 32K Prom, programmable interrupt controller with eight interrupt levels, up to 8K of RAM and a programmable keyboard interface. It costs $325.

DOSC is at 500 Fifth Ave., New York, N.Y. 10036.

S-100 Compatibles Get Disk

IRVINE, Calif. — An S-100 bus-compatible 10M-byte disk system has been introduced by Alpha Micro.

The Model AM-500 consists of a single-board controller, interconnect cable and disk drive. The disk drive is the 10M-byte Control Data Corp. Hawk, which utilizes a 5M-byte fixed disk and 5M-byte removable cartridge.

The controller is interrupt-driven, requires a simple interface to the CPU operating system and performs complete 512-byte transfers, Alpha Micro said.

Although the AM-500 was designed to work with the Amos operating system, it can be purchased as a stand-alone and used with other operating systems on the S-100 bus, a spokesman noted.

Available in a rack-mounted version or in a stand-alone cabinet, the AM-500 costs $7,995. Alpha Micro is at 17881 Sky Park North, Irvine, Calif. 92714.

Alpha Micro AM-500

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Programs on Cassettes

MORRISTOWN, N.J. — Creative Computing has released more than 120 programs on 21 cassettes and two floppy disks that offer logic games, number games, educational simulations, drill and practice exercises, word games and graphics.

Many of the programs are drawn from the book, *Basic Computer Games*, its sequel, *More Basic Computer Games*, and *Creative Computing* magazine.

Each cassette contains an average of six programs; the two floppy disks each contain 50 programs.

Individual cassettes cost $7.95 and the floppy disks are $17.95 each from computer stores or from Creative Computing, P.O, Box 789-M, Morristown, N.J. 07960.

Micro Courses Prove Popular

(Continued from 53)

tical to buy a car until you learn how to drive and people should feel the same way about microcomputers," he said.

The function of the learning center is not to sell any particular microcomputer, but rather to give a student knowledge about micros in general. The goals of the course are to enable the student to determine his specific computer needs and applications, discover what hardware best meets those needs and learn either how to define his needs to a professional or program the micro himself.

Learning Center

Bidleman defined a small computer as any system that sells for less than $5,000 and includes a maximum of 48K memory and a hard-copy printer. The learning center uses three Radio Shack TRS 80s, each with a 32K-byte memory and a disk operating system.

The center will be getting three more systems within the next month to meet the needs of the increasing enrollment. The entire program consists of 60 hours of instruction and is divided into three mini courses, any of which can be taken by the student, depending on his level of skill or interest.

The modules within the course are self-paced. Bidleman or three assistants are present during learning hours in case a student needs special help or has questions.

The Center is open from 8 a.m. to 9 p.m. most days; weekend hours will probably be expanded to meet the overflow, Bidleman said.

The only rule laid down in the program is that a student should do at least two modules a week, but not more than three at one time. After that it is up to the individual.

'Retail Store of Education'

"I consider the learning center to be a retail store of education," according to Bidleman, who said he is prepared to serve a student whenever he comes through the door — but is also prepared to let him "browse" by himself. Students can come in whenever they like and are limited only by the extent of the facilities.

Most of Bidleman's students are in their early 30s; only about one-quarter are women. Almost all seem to be excited about the program, and the only dropout has been a student who moved to China, Bidleman said.

One reason the program is such a success, he believes, is that the self-teaching method concentrates on mastery learning, not competitive learning, so it creates a non-threatening environment. This method seems to work best with adults, however, since several high school students need significantly more help and guidance, he said.

The youngest student in the course is 18 years old and the oldest is a 70-year-old author who wants to design word processing systems.

Several handicapped students are also participating in the course. One deaf student learns by coordinating the course's audiovisual equipment with a printed copy of the instructions.

Several blind students use head sets over which audio instructions are conveyed: They also have helpers who read the printed material to them.

Independent Modules

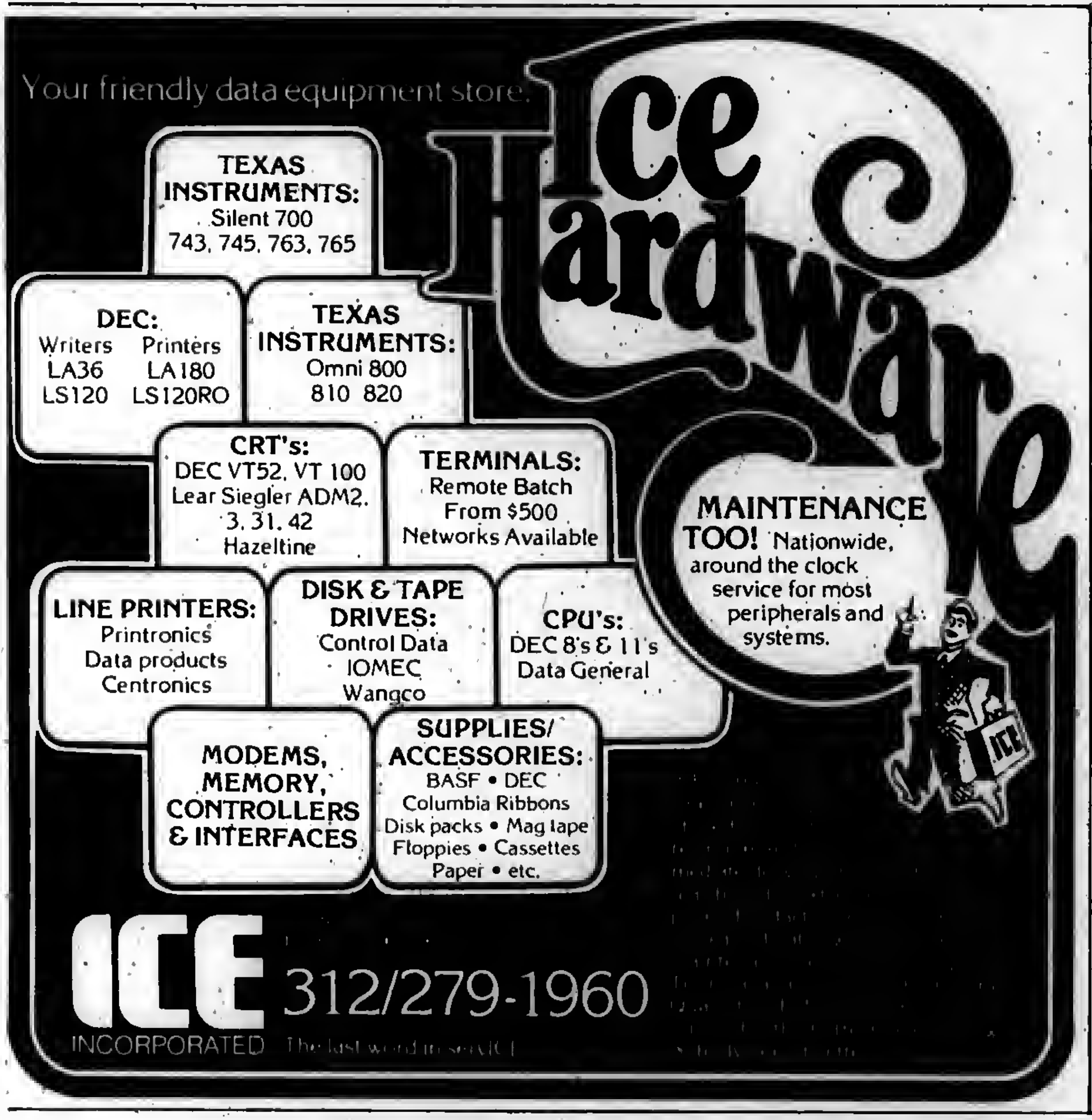
The three modules which compose the course work are all stand-alone and independent of each other. After each unit of instruction, the student can take a self-test to determine his grasp of the material.

The "Computer Hardware and Concepts" module covers material such as batch processing, time-sharing, real-time processing, peripherals and the differences between tapes and disks.

Participants in the "Programming Computers" module are expected to write a simple program in Basic upon completion of the course. The module entails determining the solution to a problem and designing output and the corresponding input, flowcharting, testing and debugging.

The third module, which covers how microcomputers are used, explores file processing and the use of master, activity and sorting files. It encourages users to project how computers can be applied to their own work.

The course is free to California residents; students pay only for course materials and lab fees. Bidleman, who expects to have as many as 300 students by the end of the year, noted that the instructional package is available through Media Systems Corp., a division of Harcourt Brace & Jovanovich, Inc. of New York.



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Longer Zip Code Set;
DP Change Seen Costly

By Don Leavitt
CW Staff

WASHINGTON, D.C. — The U.S. Postal Service has announced plans to add four digits to Zip Codes by 1981 "to help keep down postage rates," but DPers are beginning to see the other side of the picture — the cost of modifying existing systems to handle the enlarged Zip fields.

Postmaster General William F. Bolger
the decision to go with an add-on
"substantially reduce
Postal Service and
'sor-

companies' introduction of area codes Bolger said, "which has enabled the carriers to increase their electronic switching capability, hold down rates and improve service.

The banking system also uses an expanded numbering system to aid in the automated processing and "sortation of checks, Bolger noted.

The current five-digit Zip Code guides the sorting of letters and other mail to 40,000 post offices, stations and branches. The additional four numbers will carry the process further. Within all five-digit delivery areas, each block of a street, office buildings
companies receiving large volumes
assigned a four-digit
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IN DEPTH
IN DEPTH

IN DEPTH

Why APL?

By Robert E. Cook and Allen J. Rose

Interactive programming languages are on the move again, thanks to the business community's need and enthusiasm for an understandable computer language. The much trumpeted price/performance improvements in hardware, coupled with inflation-driven increases in personnel costs, are giving new life and growth to interactive programming languages.

The economic benefits of interactive computing are increasingly evident, effecting a bright future for this 17-year-old innovation. It yields significant gains in personnel productivity since results can be obtained quickly.

The improved economics that apply to increased programmer productivity using interactive computing also apply to increased programmer productivity using a language designed for interaction. Research shows APL (A Programming Language) gives a huge increase — 300% to 500% — in programming productivity at some price in run time efficiency. ~~This~~ efficiency "penalty" is becoming increasingly less expensive.

APL usage is increasing at a rapid rate because of its inherent productivity benefits. Hence, a review of the history of APL and its application to business analysis will interest many DP professionals.

Motivation for Notation

In the late 1950s, Kenneth Iverson, then an applied mathematician at Harvard University, had an academic interest in various algorithmic processes such as methods of arranging data into ascending order, new ways to calculate Eigenvectors and procedures (manual or computer) for running and managing order/shipping/billing systems.

One of Iverson's nagging problems was how to communicate his new ideas efficiently to others. The most obvious possibility was our native language, but experts in most technical disciplines know very well that even English (which seems better than most other languages for this purpose) can become cumbersome and confusing when used to describe detailed, abstract concepts.

Many systems designers have experienced this difficulty when writing specifications for a computer application that some other group will code. When we attempt to run the completed system, we find the finished product is far different from that which the original analyst thought was specified.

In order to assure total understanding, one must employ great detail — so much so that preliminary specifications are often much larger than the resulting program.

Because of the limitations of English, Iverson considered other means of communications. He was aware of the then-developing computer programming languages, but dismissed their use because none supported array (table) computations directly. Further, he felt that storage allocation statements (such as DIMENSION, DATA DIVISION and similar conventions) were roadblocks to exposition and comprehension in the people-to-people communication of information.

Iverson also recognized the inadequacies of conventional mathematical notation. For example, the symbol "x" has been used to mean ordinary scalar multiplication and matrix multiplication and to represent "and" for Boolean mathematics. The pi symbol means both 3.14159 and cumulative multiplication.

The traditional approach taken by authors to represent their ideas (when conventional notation runs out) is to fabricate their own extensions. The result of this practice is a virtual Tower of Babel in mathematics literature. Much effort is wasted in applied texts by explaining local notational conventions.

Iverson recognized that conventional mathematical notation was the best starting point to solve this problem. Since he was interested in a broad variety of quantitative problems, he set out to develop one notation covering them all.

This effort led to a comprehensive notation which Iverson felt was adequate for describing algorithmic processes, with no bias toward any particular application area.

Iverson's book, *A Programming Language* (Wiley, 1962), set forth the author's notation as an Esperanto for quantitative expression. In that same year Iverson joined IBM's Research Center in Yorktown Heights, N.Y. There, he and a few devotees conti-

(Continued on In Depth/2)

(Continued from In Depth/1)

nued to investigate the adequacy of his notation for solving a variety of problems.

These studies were called *formal descriptions*; an expert selected classical problems from his own field, such as fluid mechanics, computer architecture or accounting, and described these "textbook" problems in Iverson's notation. He then supplied data and manually worked through the steps to see if the results were as expected, if the statement of the problem was unambiguous and if the entire process was "comfortable."

The Implementation

To eliminate the hand calculation required, Iverson commissioned an implementation of his notation on a computer. In the fall of 1965, this implementation was completed and put into use.

It soon became apparent to many that the implementation had potential beyond the limited research environment for which it was originally designed. As part of selling IBM management on the merits of promoting Iversons computer-assisted notation, the group chose the acronym APL to describe it. Since IBM's language policy was firmly centered on Cobol, Fortran and PL/I at the time, the appeal to promote APL was unsuccessful.

Meanwhile, the availability of APL at the Yorktown Heights Research Center was attractive to the research staff. Many people within IBM learned APL and used it daily in their work. Word of this use spread throughout IBM by informal channels.

By 1974, APL had become the most widely used interactive system within IBM. Interestingly, most of this APL use was for commercial applications.

Led by this internal growth, APL began to leak out. Prior to unbundling, APL was available free to outside organizations. Universities explored it, and time-sharing companies seeking innovations began to offer it. Today APL is available on many modern computers, and more than 30 time-sharing companies provide APL service as well.

Reacting to this acceptance in the marketplace, IBM has gradually given APL an increasingly important official status. The current primary APL offering from IBM is VSAPL.

In spite of the fact that APL's origins are in research, its dominant use today is for commercial data processing. How could a system conceived by mathematicians, highly symbolic in nature and lacking official sanction become so popular? We can only suspect it is because of its merit and highly favorable experience by users.

If ubiquitous DP terms like DASD, JCL and Ebcdic can be briefly ignored, the goal of involvement with computing returns to consciousness. Most business people are concerned with the timely and accurate acquisition, retention, computation, retrieval and display of business information.

The APL language, along with a report formatter and an APL-oriented file system, can be used very effectively for business and financial analyses and computations.

APL Calculations

One of the major reasons why Iverson didn't base his Harvard work on existing computer programming languages was because they generally lacked built-in array (table) handling features. Mathematicians tend to use the term "matrix algebra" to describe this activity; business people view it as performing calculations on lists or tables of values, such as revenues and expense data for a number of time periods.

Examinations will show that table-oriented calculations comprise a surprisingly large part of business and financially oriented analyses. Examples in APL are shown in Figure 1. These lists (or vectors) can be displayed by simply typing their names, as in Figure 2.

Simple arithmetic operations can be performed on the data without having to resort to loops, structured programming or data base management (Figure 3). Accumulations can also be obtained very simply (Figure 4), and even running totals are "primitive" operations (Figure 5).

Thus cash flows can be obtained as shown in Figure 6. This operation reports on the number of data items in a list (Figure 7) and the average revenue is computed by the equation shown in

(Continued on In Depth/7)

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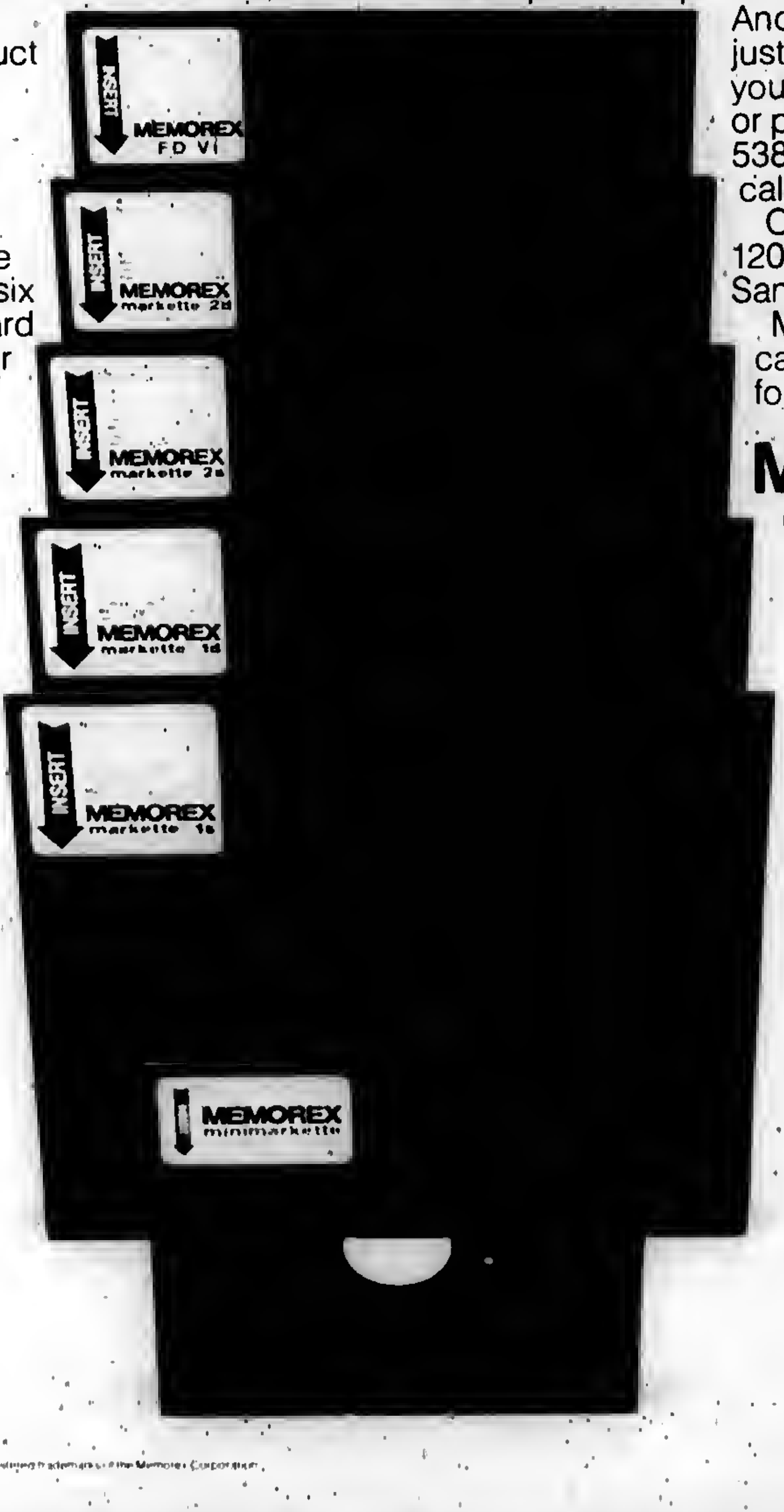

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```
      REVENUES←10000 12500 25000
      EXPENSES← 5500  7125 15000
```

Figure 1

```
      REVENUES
10000 12500 25000
      EXPENSES
5500 7125 15000
```

Figure 2

```
      REVENUES-EXPENSES
4500 5375 10000
      REVENUES÷EXPENSES
1.818181818 1.754385965 1.666666667
      EXPENSES÷REVENUES
0.55 0.57 0.6
```

Figure 3

```
      +/REVENUES
47500
```

Figure 4

```
      +\REVENUES
10000 22500 47500
      +\EXPENSES
5500 12625 27625
```

Figure 5

```
      +\REVENUES-EXPENSES
4500 9875 19875
```

Figure 6

```
      ρREVENUES
3
```

Figure 7

```
      (+/REVENUES)÷ρREVENUES
15833.33333
```

Figure 8

```
      TABLE←2 3ρREVENUES, EXPENSES
```

Figure 9

```
      TABLE
10000 12500 25000
 5500  7125 15000
```

Figure 10

```
      TABLE←TABLE,[2]+/[2]TABLE
      TABLE
10000 12500 25000 47500
 5500  7125 15000 27625
```

Figure 11

```
      +/[1]TABLE
15500 19625 40000 75125
      -/[1]TABLE
4500 5375 10000 19875
```

Figure 12

```
      TABLE←TABLE,[1]-/[1]TABLE
      TABLE
10000 12500 25000 47500
 5500  7125 15000 27625
 4500  5375 10000 19875
```

Figure 13

```
      TABLE←TABLE,[1].48×TABLE[3;]
      TABLE

10000           12500           25000           47500
 5500            7125           15000           27625
 4500            5375           10000           19875
 2160            2580            4800            9540
```

Figure 14

```
      TABLE←TABLE,[1]-/[1]TABLE[3 4;]
      TABLE
10000           12500           25000           47500
 5500            7125           15000           27625
 4500            5375           10000           19875
 2160            2580            4800            9540
 2340            2795            5200           10335
```

Figure 15

(Continued from In Depth/2)

Figure 8.

Our revenues and expenses figures can be put together into a two-dimensional table (Figure 9). Here we catenated (,) revenues and expenses together (a list with six items), then reshaped (ρ) those six items into a table with two rows and three columns (Figure 10).

For display purposes, it may be desirable to catenate a column of totals to the table, as shown in Figure 11. Here, we're stating over which dimension we should sum, since TABLE has more than one dimension. Naturally, Figure 12 also works.

We can catenate the gross profits as another row of TABLE as shown in Figure 13. Calculating taxes as .48 of gross profits and catenating another row is shown in Figure 14. Note that this display is mysteriously spread out. So far, we haven't been concerned with how APL displays its results — it obtained the right answers, but not necessarily in the desired format.

Before we address that, let's complete the table to include net profits (Figure 15. The data is now computed for a simple corporate operating statement, but most managers would not accept these results without annotation such as title, names for the various rows and columns and other formatting features.

Formatting Features

When APL was implemented on a computer, the language did not have commercial report-formatting features

(Continued on In Depth/8)

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```
      '3I8,I12' ⎕FMT (TABLE)
  10000   12500   25000          47500
   5500    7125   15000          27625
   4500    5375   10000          19875
   2160    2580    4800           9540
   2340    2795    5200          10335
```

Figure 16

```
     '3CI8,CP<$>F13.2' ⎕FMT (TABLE)
  10,000  12,500  25,000   $47,500.00
   5,500   7,125  15,000   $27,625.00
   4,500   5,375  10,000   $19,875.00
   2,160   2,580   4,800    $9,540.00
   2,340   2,795   5,200   $10,335.00
```

Figure 17

```
        'G<PHONE (999) 999-9999>'
        ⎕FMT (9144286910 3016578220)
    PHONE (914) 428-6910
    PHONE (301) 657-8220
```

Figure 18

```
 XX←¯98765 0.12 0 123.45 1234567890
 'CBR<      NONE >M<(>N<)>Q< >F15.2' ⎕FMT (XX)
    (98,765.00)
           0.12
           NONE
         123.45
***************
```

Figure 19

(Continued from In Depth/7)

— we lived with what APL chose to print or went through mental contortions to bend the data into acceptable form. APL's utility for commercial applications would have been diminished had its developers ignored this important aspect of computing.

A variety of formatting "primitives" have been developed for APL. One of the more popular schemes was developed by Scientific Time Sharing Corp. (STSC) and has Fortran's flavor. To format the integer table in Figure 15 into three columns eight characters wide and one column 12 characters wide, STSC's formatter works as shown in Figure 16.

But even here APL implementors have provided features desirable in commercial reporting, such as floating currency symbols (Figure 17). Of course, the popular picture phrase is provided also (Figure 18).

Figure 19 formats a list of values in a field 15 wide, with commas every third position, two trailing decimal digits and negative numbers in parentheses. It prints NONE wherever the data value is zero. The stars in the last row indicate the number was too long to fit in the field provided.

Formatting numeric results is only part of the job in report preparation. Another significant aspect is surrounding the data with meaningful titles and annotation. The fundamentals of character handling in APL are quite simple, as Figure 20 demonstrates.

That statement finds the occurrence of the first blank in the list of characters. A command like the one in Figure 21 drops the first 10 characters and leaves the rest to print.

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```
        TITLE←'OPERATING STATEMENT'
        ρTITLE
19
        TITLEι' '
10
```

Figure 20

```
              10↓TITLE
        STATEMENT
```

Figure 21

```
    ∇ REV REPORT EXP
[1]   ⍝ LEFT ARG IS REVENUES, RIGHT IS EXPENSES.  AJROSE 2 APR 77
[2]    ARRAY←(2,ρREV)ρREV,EXP ⍝ MAKE TABLE
[3]    ARRAY←ARRAY,[2]+/[2] ARRAY ⍝ SUM ACROSS AND CATENATE
[4]    ARRAY←ARRAY,[1]-/[1] ARRAY ⍝ ROW 3: GROSS PROFIT
[5]    ARRAY←ARRAY,[1] 0.48×ARRAY[3;] ⍝ ROW 4: TAXES
[6]    ARRAY←ARRAY,[1]-/[1] ARRAY[3 4 ;] ⍝ ROW 5: NET
[7]    LINES←10 ROWNAMES '/REVENUES/EXPENSES/GROSS/TAXES/NET'
[8]    FORMAT←'10A1,3(CI8,X3),R<$>CI10'
[9]    FORMAT CENTER 'OPERATING STATEMENT'
[10]   ''
[11]   FORMAT COLNAMES '/LINE ITEM/DIV. A/DIV. B/DIV. C/TOTAL'
[12]   ''
[13]   FORMAT ⎕FMT (LINES;ARRAY)
    ∇

          10000 12500 25000 REPORT 5500 7125 15000
                     OPERATING STATEMENT

    LINE ITEM    DIV. A      DIV. B      DIV. C        TOTAL

    REVENUES     10,000      12,500      25,000      $47,500
    EXPENSES      5,500       7,125      15,000      $27,625
    GROSS         4,500       5,375      10,000      $19,875
    TAXES         2,160       2,580       4,800       $9,540
    NET           2,340       2,795       5,200      $10,335
```

Figure 22

Now we have a program that accepts a list of revenues and a list of expenses, and prepares a completed report. CENTER, ROWNAMES and COLNAMES are prepared programs which make titling easier (Figure 22).

Voluminous Data

A frustrating "feature" of early APL implementations was the inability to access more than a handful of data. This was partly because implementation was originally intended to serve modest scientific needs and partly because APL was implemented with a swapping scheme that didn't mix well with a virtual machine architecture. As with formatting, user needs dictated that in order to survive, APL had to be able to handle more data than the roughly 32K bytes provided in the original version.

The problem of dealing with large amounts of data in APL can be approached in four different ways. The first is to ignore the problem. This simply does not work.

While there are facilities for copying data from one "workspace" to another, these are purposely implemented to require manual intervention to prevent overloading the swapping mechanism of the system.

The second approach, adopted in some APL installations, is to modify the system to allow COPY commands to be executed under program control. The commands are typically stored as character arrays and executed by tricking the system to think they are keyboard inputs.

Because APL was originally implemented assuming infrequent, manual use of the facility, processing bogged down with even moderate use of the automated variant.

The third approach — also a popular one — is to employ the virtual memory by simply increasing the workspace size to a few million bytes. From an APL purist's vantage point, this is an elegant approach — no additional language features have to be conjured up.

Virtual storage is not free, however; in the case of APL, its acceptance is its own undoing. Imagine performing some array operation on two large arrays that just happen to reside in different pages. The system must page for nearly every operation.

A clever virtual operating system would compensate for that by keeping the relevant pages in main memory. If you have 10 or 50 or 100 APL users connected, all doing large array operations simultaneously, the available main storage will be exhausted.

Further, this simplistic approach of using virtual storage does not address the need to share data among users. In effect, it precludes the possibility of doing real-time processing employing shared data bases.

IBM's more recent APL offerings, APLSV and VSAPL, provide an elegant interface mechanism called "shared variables." Through this interface, the APL user can access data stored by other APL users as well as data stored by alien (non-APL) processors.

For example, one can get at OS data sets or embody any of the commercially available data base management systems in his APL code. This technique can be applied when APL applications are written to perform interactive information retrieval on data stored by the production systems.

The problems with selling this approach to APL people is that most of them are not DP professionals in the classic sense. They are reluctant to deal machine-dependent data representations. The typical APL user knows there is a difference between numeric data and character data, but packed-decimal, half-word integer, double-precision floating-point and bit storage are alien concepts. As we've seen in the previous examples, you don't need to know them to get the business results you need.

The fourth approach is to provide a file system harmonious with APL philosophy — that is, not concerning the user with internal representation but being more sparing of computer resources than faking the manual com-

(Continued on In Depth/10)

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(Continued from In Depth/9)

mands or resorting solely to virtual workspaces. This solution is used by many major APL time-sharing vendors and several computer manufacturers; it can also be implemented via the shared variable mechanism of today's IBM APL offerings.

Many of these APL file systems differ in external appearance and in certain features, but the general approach is the same for almost all.

Experience has shown changing from one version to another is not a major problem.

APL File Systems: An Example

Imagine being responsible for keeping the medical records of some 5,000 patients. When a patient comes in for a visit, a standard set of 13 tests is done, and all 13 test results are kept for future analysis and study.

Although the same tests are made for each patient at each visit, some patients may accumulate many more visits than others. Records are kept only for the most recent 100 visits of each patient.

A likely structure for holding this data (if it could fit in the workspace) would be a three-dimensional array of patients by visits and by test results. In the file we're going to make, the component or record numbering will correspond to the first dimension of this hypothetical three-dimensional array, and each component will consist of a given patient's data. Each component will be a matrix whose row dimension is the number of visits so far, and there will be 13 columns for the 13 test results.

First we have to create and name a file (Figure 23). The operation ☐FCREATE is used to create the file. The left argument is the name of the file and the right argument is the file tie number or the number that logically connects the user with the desired data file.

There is no permanent connection between a file name and a file tie number. A file can be tied to whatever number you choose in any session.

☐FSIZE helps the user determine physical attributes of a particular file. Its argument is an active file tie number. The result is a four-element vector holding (1) the lowest numbered component in the file, (2) the number of the next available component in the file, (3) the amount of space currently used in the file and (4) the total space available in the file (Figure 24).

The lowest component in our file is 1, but the next available component is also 1. This an indication that the file is empty, which is certainly what we'd expect for a file into which we have put nothing. The third element is zero, again indicating an empty file. The last element is 100864, which is the nominal byte capacity for this file.

Our file obviously doesn't have the capacity to hold all the data we intend for it. This space can be provided in two ways. If we had created the file in Figure 25, then it would have had the required capacity (computed from 4 bytes per integer to be stored, times 5000 patients, times 100 rows, times 13 columns), plus 4% overhead.

Alternatively, we could have used ☐FRESIZE (Figure 26). The right argument is the file tie number, and the left argument is the amount of space to be reserved for the file.

Let's now begin to store some data in the file. We'll use the variables P1 and P2 which contain data on-hand for two patients (Figure 27).

We are simulating Patient 1 with two visits and Patient 2 with one visit. In Figure 28, we put Patient 1 on the file, using ☐FAPPEND.

☐FAPPEND puts the value of its left argument as a new component at the end of the file designated in the right argument. The lowest component is still number 1, but the next available component is now number 2. The "diamond" character acts as a statement separator.

Continuing, we add Patient 2, as shown in Figure 29. Note that the space used (third element of the result of ☐FSIZE took a big jump after the first ☐FAPPEND, but didn't increase after the second. This is the result of internal trade-offs for storage and time efficiency.

When you make your first append, the system reserves 6,304 bytes of storage, keeps it handy and won't reserve any more until you've used it all up.

To read information from a file, ☐FREAD is used (Figure 30). This brings into the active workspace an

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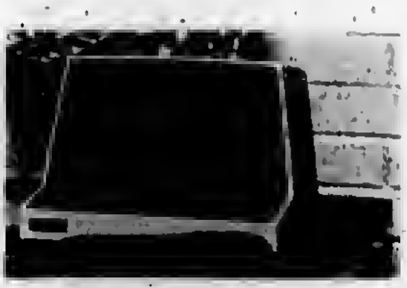
You: I've heard of you guys... what can you offer me?	?	 **Randal:** Well, how about your own distributorship... with the highest gross margins in the business. We'll provide you with everything your customers will need... hardware, software, service, everything.
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```
'MEDICAL' ⎕FCREATE 76
```

Figure 23

```
          ⎕FSIZE 76
1 1 0 100864
```

Figure 24

```
'MEDICAL 28000000' ⎕FCREATE 76
```

Figure 25

```
28000000 ⎕FRESIZE 76
```

Figure 26

```
      P1
 3  5  5  6  1  2  4  6  3  2  1  4  2
 9  3 13  4  2  1  4  3  3  8  4  8 19
      P2
23  5  1  4  8  9 10 20  3  4  5 12  5
```

Figure 27

```
      P1 ⎕FAPPEND 76
      ⎕FSIZE 76
1 2 6304 28002368
```

Figure 28

```
      P2 ⎕FAPPEND 76 ◇ ⎕FSIZE 76
1 3 6304 28002368
```

Figure 29

```
P2←⎕FREAD 76 2 ◇ P1←⎕FREAD 76 1
```

Figure 30

```
    ∇ R←TOTVISITS N;COUNTER
[1]  ⍝ N IS THE FILE TIE NUMBER
[2]   R←0 ◇ COUNTER←(⎕FSIZE N)[1]-1
[3]  LOOP:COUNTER←COUNTER+1 ◇ →0 IF COUNTER=(⎕FSIZE N)[2]
[4]   R←R+1↑ρ⎕FREAD N,COUNTER ◇ →LOOP
    ∇
      TOTVISITS 76
3
```

Figure 31

```
    ∇ NEWPATIENT N
[1]   ⍝ N IS THE FILE TIE NUMBER
[2]    'THIS IS PATIENT ';(⎕FSIZE N)[2]
[3]    (0 13ρ0) ⎕FAPPEND N
    ∇
```

Figure 32

```
    ∇ P NEWVISIT N;DATA
[1]  ⍝ P IS PATIENT NUMBER, N IS FILE TIE NUMBER.
[2]   →OK IF (P≥(⎕FSIZE N)[1])∧P<(⎕FSIZE N)[2]
[3]   'NO SUCH PATIENT NUMBER' ◇ →0
[4]  OK:'ENTER 13 VALUES'
[5]   →UPDATE IF 13=ρDATA←,⎕
[6]   'INVALID INPUT: ';ρDATA;' VALUES ENTERED' ◇ →0
[7]  UPDATE:DATA←(⎕FREAD N,P),[1] DATA ◇ DATA ⎕FREPLACE N,P
    ∇
```

Figure 33

```
(((-100⌊1↑ρDATA),13)↑DATA) ⎕FREPLACE N,P
```

Figure 34

```
    ∇ R←V LASTVISIT N
[1]  ⍝ V IS PATIENT NUMBER; N IS FILE TIE NUMBER
[2]   R← 0 13 ρ0
[3]  LOOP:→0 IF 0=ρV ◇ R←R,[1] ¯1 13↑⎕FREAD N,1↑V ◇ V←1↓V ◇ →LOOP
    ∇
```

Figure 35

```
    ∇ R←REL SELECT NCV;N;C;V;I
[1]  ⍝ N IS 3-ELEMENT VECTOR: FILE TIE NUMBER, COLUMN, VALUE
[2]  ⍝ REL IS LITERAL RELATION SYMBOL (<≤=≥> OR ≠)
[3]   N←NCV[1] ◇ C←NCV[2] ◇ V←NCV[3]
[4]   R←⍳0 ◇ I←(⎕FSIZE N)[1]-1
[5]  LOOP:I←I+1 ◇ →0 IF I=(⎕FSIZE N)[2] ◇ COMP←(⎕FREAD N,I)[;C]
[6]   R←R,(∨/⍎'V',REL,'COMP')/I ◇ →LOOP
    ∇

                  '=' SELECT 76 4 6
          1
                  '<' SELECT 76 12 19
          1 2
```

Figure 36

image of the file component. Although in this example we read the values back into the same variables from which they came, it is not necessary. For example, we could have entered P2⎕FREAD 76 1 and P1⎕FREAD 76 2, which would interchange the data for patients 1 and 2 in the workspace (but not in the file).

Figure 31 shows a simple function to find the total number of visits by all patients (that is, the total number of rows in the file).

Here are two more examples of programs that are obvious necessities: (1) establishing a new patient in the file by methods slightly more sophisticated than that done previously and (2) adding the results of a subsequent visit to any individual patient's data already in the file.

The first is handled by the defined function NEWPATIENT (Figure 32). This function simply appends an empty matrix for the new patient and prints the patient number that was assigned.

Figure 33 demonstrates a defined function for recording the data gathered on a patient's visit. The new file function, FREPLACE, on line 7, replaces the P-th file component with new data from the workspace. In our case, it's the catenation of what was in the component with another row, DATA, on the bottom.

Unique Relation

There doesn't have to be any relation between what is being replaced and what it is being replaced by, although in this example case there happened to be. The requirement that only the most recent 100 visits are to be kept in the file can be satisfied simply by changing the second statement on line 7 to read as in Figure 34.

Having written functions to enroll a new patient and enter the data from a visit, we now turn to programs for getting selected data from the file. Complete data on each patient can be obtained by reading his component. Figure 35 shows a function for obtaining a table consisting of the data from a set of patient's most recent visits. Figure 36 shows how more general search and retrieval tasks can be performed.

We could continue with this example, but the point has been made. The APL file consists of a sequence of records or components, each of which is an arbitrary APL data object.

There need be no preordained pattern of shapes, sizes or data types for the

(Continued on In Depth/12)

(Continued from In Depth/11)

file organization. Records can be replaced by larger records or by other data types. The user does not have to be concerned about the internal representation of data.

There are also functions to drop records from the low end or the high end of the file, thereby facilitating first in/first out (Fifo) and last in/first out (Lifo) architectures. Since the organization is arbitratry, the user can build keyed indexed systems easily by using fixed components (or even a second file) as the keys.

A Business Computation Notation

It is clear that APL has inherent merit in algorithmic expression. Augmented by a report formatting system and a file system, it satisfies the requirements of commercial data processing.

However, a controversy still lingers over symbolic notations (of which APL is an example) vs. English-like programming languages such as Cobol. The controversy centers around the trade-off between clumsy interactive programming structures, such as Cobol's DIVISION structure and unforgiving syntax analyzer, and APL's strange-looking notation.

Many DP professionals believe the demand for increased programmer productivity will combine with modern executives' demands for a clear, concise interactive programming language to create an explosive demand for APL. As more top business managers gain and use formal quantitative business skills, APL will move into the executive suite in a way that conventional languages cannot.

APL is a way to think and express oneself quantitatively, rather than another structured language to convert a series of calculation steps to machine-readable form. As a new means of thinking, APL will provide huge productivity increases throughout many organizations.

An interesting exercise is to solve the problems presented in this discussion with Fortran, Cobol or Basic, then compare the amount of code required with the APL solutions represented. You will find that the vast increase in code beyond that required for an APL solution illustrates the inherent "people productivity" of the APL language.

The increase in APL use, already experienced by firms such as IBM and Xerox, will soon spread to much of the rest of the business community. Why? Because as a tool for business and financial analysis and planning, APL simply has no peer.

Cook

Rose

Robert J. Cook is vice-president of planning at Scientific Time Sharing Corp., which he joined in 1977. He has been involved with APL since 1974.

Cook has extensive experience in the computer services industry. His previous positions include both technical and marketing positions at U.S. Time-sharing and product line manager of time sales with Boeing Computer Services, Inc.

Cook graduated from Indiana University of Pennsylvania and holds an MBA from George Washington University.

Allen J. Rose is a founder of Scientific Time Sharing Corp. (STSC), where he is now vice-president and technical director.

Prior to his association with STSC, Rose was program administrator for APL in the Data Processing Division of IBM. From 1965 to 1968, as an IBM research staff member, he taught and promoted the use of APL.

Previously Rose was a statistician and computer consultant at Procter and Gamble's Development Center. He is a graduate of Duke University.

Rose is co-author of APL: An Interactive Approach, *an APL textbook. He was recently selected as a 1978–1979 Association for Computing Machinery national lecturer.*

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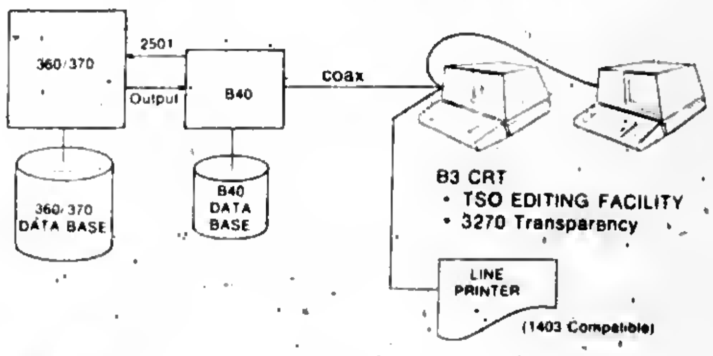

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Their Own 64K on the Way

IBM Chip Doesn't Worry Independents

By Marcia Blumenthal
CW Staff

IBM's recent announcement of its 8100 system incorporating a 64K-bit memory chip [CW, Oct. 9] has elicited a minimum degree of concern and surprise from independent chip makers.

The independents are not concerned because they do not compete directly with IBM and because IBM's chip does not exhibit a technological advance, they told *Computerworld* in a recent informal poll.

Most independents are gearing up to introduce a 64K chip in sample quantities no later than the first half of next year, the poll found. The first shipments are expected by the last half of 1979.

IBM is in the process of evaluating new technology, taking a wait-and-see attitude before deciding on whether to go with scaled MOS or VMOS technology, according to Jim Coe, director of marketing for digital products at Intersil, Inc.

Independents are not yet sure which technology will dominate — if any — and they don't have the luxury of investing in two separate technologies, Coe stressed. IBM could probably afford to invest in both technologies, he noted.

"It's been obvious that, in the past year, IBM has been playing catch-up with the industry," Coe remarked. However, IBM's technology is not as up-to-date as that of the independents, he contended, so it should not affect any independent makers.

The key thing to realize, Coe continued, is that IBM did not announce new technology. The IBM chip is probably fairly large and is a short-term solution until IBM can decide which of the technologies is the most feasible for use in its systems.

In the next few years, Coe said, IBM will probably do more business with independents because it will have problems keeping up with the demand for its products. Furthermore, by buying from outside suppliers, IBM will acquire the technology to compete with independent add-on memory makers, he added.

Intersil is going the way of scaled MOS technology. Coe expects a slew of announcements of 64K chips by next spring, but he said it will be late 1979 before chips with new technology are delivered.

Surprised at Gates

Mostek Corp. expects to have sample quantities of its 64K chip ready by the first quarter of next year and shipped during the second half of the year.

Gordon Hoffman, manager of Mostek's Memory Components and Memory System Department, was surprised to see a state-of-the-art chip size using metal gates. "metal

(Continued on Page 58)

MIT Head Sees Technology Solving World's Problems

By Dick Cox
Special to CW

SAN FRANCISCO — Although modern technology has serious side effects, the "software and knowledge industries" will find solutions to mankind's most complex problems, according to Dr. Jerome B. Weisner, president of MIT.

Keynoting the third U.S.-Japan Computer Conference here recently, Weisner told computer experts from both nations that while many complaints against today's technology are valid, the world needs faster solutions to its problems and democracy may not survive if the job isn't done quickly enough.

"A state of mind close to schizophrenia exists" in today's world regarding technology, Weisner said. On one hand, "most of us believe a need exists for new technology," but at the same time there is increasing alarm that new technology brings new problems.

'Upsetting Aspects'

The MIT president recalled that for nearly 20 years he has been "cast . . . in the role of spokesman for American science," both as a Presidential and congressional adviser, and thereby forced "to hear about those aspects of technology that are upsetting."

In the course of his work, Weisner said he has drawn several conclusions.

Most important of all, he said, is that mankind's well-being — economic, social and political — depends on the continuing availability of technology.

"It is only through new knowledge, new approaches and new technologies that we assure a satisfactory world for those that come after us," Weisner said.

He also expressed concern for the long-range alternatives to present energy technologies — solar energy, thermal energy and fusion power. Pointing out that the hoped-for sources of energy depend on technologies not yet available, Weisner said he is "confi-

(Continued on Page 58)

Nine-Month Results Show Rise At IBM, Burroughs and Itel

IBM, Burroughs Corp. and Itel Corp. all posted both revenues and earnings increases in their third-quarter and nine-month financial reports.

In terms of percentages, Itel led the group, with third-quarter revenues running 90% ahead of last year and earnings up 54% over 1977 third-quarter results.

IBM earned $816 million or $5.60 a share for the quarter, an 18% rise from last year's third-quarter earnings of $690 million or $4.66 a share.

Revenues for the quarter topped $5.285 billion, a 15% increase from the $4.586 billion in revenues reported in the year-ago quarter.

Nine month revenues totaled $14.683 billion, advancing 12% from the $13.095 billion reported in the same period last year. Earnings were $2.096 billion or $14.34 a share, a 9% gain on the $1.922 billion or $12.92 a share earned in the first nine months of 1977.

"While earnings comparisons for the quarterly and year-to-date periods show improvement over the six months' report; growth in costs and expenses continues to reflect the pressures of inflation and the ongoing build-up of resources to meet strong customer demand," according to Frank T. Cary, IBM chairman of the board.

(Continued on Page 56)

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Three Mainframers Report Earnings Increases

(Continued from Page 55)

Cary said purchases of DP equipment showed a substantial increase in the third quarter and nine months of this year compared with the same year-ago periods.

"Gross income from rentals and services increased 10.6% over the first nine months of 1977," he added.

Earnings for the nine-month period included exchange gains of $99 million, consisting primarily of unrealized gains from the translation of foreign currency assets and liabilities, Cary said.

Itel Earns $12 Million

In its third quarter, Itel earned $12.9 million or $1 a share on revenues of $187.1 million. In the corresponding period a year ago, the company posted earnings of $8.4 million or 75 cents a share on revenues of $98.3 million.

For the nine months, revenues reached $453 million, up 73% from 1977 revenues of $262.3 million. Earnings totaled $29.7 million or $2.42 a share, gaining 50% on 1977 nine-month earnings of $19.7 million or $1.82 a share.

Third-quarter results reflect a change in the estimated tax rate for the year from 42% to 40%, Itel said.

In commenting on the results, Itel President Peter S. Redfield said deliveries and backlogs for the Advanced System family of mainframes continued to increase monthly. He also noted that the Data Products Group will probably surpass its objective of shipping 200 Advanced Systems in 1978.

Itel continued to take advantage of access to financial markets by negotiating an unsecured $500 million line of credit at the prime rate, Redfield observed.

Burroughs Up 18%

Burroughs also scored increases in revenues and earnings for its third quarter with earnings advancing to $51 million or $1.25 a share, an 18% improvement from 1977 third-quarter earnings of $43.1 million or $1.06.

Revenues for the period climbed 17% from $490.2 million last year to $575.2 million this year.

Revenues for the nine months reached $1.673 billion, a 16% increase from last year's nine-month revenues of $1.447 billion. Earnings for the three quarters were $142 million or $3.48 a share compared with 1977 nine-month earnings of $121.1 million.

Rental and service revenue rose 13% in the nine months and outright sales increased 18% over last year.

Incoming orders were ahead 14% in the third quarter and up 16% for the nine-month period compared with a year ago, according to Paul S. Mirabito, Burroughs chairman.

Contracts

Logicon, Inc. has received a contract from the Air Force Aeronautical Systems Division for approximately $3 million to provide support services to the Strategic Systems Program Office at Wright-Patterson Air Force Base, Ohio.

Kennedy Co. has been awarded two German contracts totaling $500,000 or magnetic tape transports from VDE, an association of German electrical engineers which conducts product testing. Ruf-Kienzle, Munich, has signed a $350,000 contract for Model 9700 transports which will be used in small business and inventory systems. ITT-Standard Electric Lorenz, Stuttgart, will purchase $150,000 worth of Kennedy Model 9800 transports for use in ADX6200 private branch telephone systems.

Three contracts have been awarded by the U.S. General Services Administration: Victor Business Products, $2.3 million, for electronic calculators and terminals at El Paso, Texas; Government Marketing Services, Inc., $2.2 million, for electronic calculators at Lubbock, Texas; and GRM Corp., $2.7 million, for radio equipment and accessories at Medford, N.J.

The Datawest Corp. has been awarded a multimillion-dollar contract from Univac for the design and manufacture of a series of high-speed microprogrammable array processors. They will be used for a system handling digital data reduction for geophysical applications.

E-Systems, Inc.'s ECI Division has won a U.S. Marine Corps contract to provide landing assault forces with a capability for worldwide communications via satellite. Under the $1,125,000 contract, E-Systems will build 10 satellite communications central systems, each of which will be equipped with three satellite communications terminals.

The Data Services Division of Informatics, Inc. has been awarded a $502,000 contract from the Department of Transportation's National Highway Traffic Safety Administration to operate its Fatal Accident Reporting System.

The Pertec Division of Pertec Computer Corp. has been awarded a $1.9 million contract by Warrex Computer Corp. Under the terms of the two-year contract, Pertec D3000 disk drives will be used in the Warrex Centurion Series V small business computer.

Computer Automation, Inc. has signed a contract to supply approximately $10 million of its Syfa network processing systems equipment to Continental Insurance Co.

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Developed at Bell Labs

Layering Method Promises Double Semi Speed

MURRAY HILL, N.J. — Researchers at Bell Telephone Laboratories here have developed a layering technique that enables them to build semiconductors which are twice as fast as older semiconductors at room temperature and up to 20 times as fast at lower temperatures.

The technique allows electrons in a semiconductor to move twice as rapidly as before, which could permit system designers to improve the speed of their devices and reduce electrical power consumption, Bell said.

In modern semiconductors, the electrical properties of the devices are controlled by the addition of "impurities," but a factor limiting the electrical conductivity of the devices is the tendency of the electrons — charged negatively — to be slowed down by positively or negatively charged impurities.

With the layering technique, electrons can be isolated from these impurities, allowing them to move with little interference and therefore creating the higher speeds.

Until now, the speed of semiconductor devices has usually been improved by physical designs that reduce the distances electrons have to travel. By boosting electron speed, this latest advance has opened up a new approach to enhancing device performance, Bell claimed.

If widely used, it could, for example, hasten the day of ultra fast supercomputers, the researchers added.

It could also help multiply the capacity of communications systems and increase their versatility.

The technique is an extension of the usual method for boosting a semiconductor's ability to carry current. Small amounts of an element are purposely added as an impurity to donate free electrons.

In the case of the semiconductor gallium arsenide, the impurity is often silicon. Each silicon impurity atom gives up one of its electrons, which moves through the semiconductor as current.

The silicon left behind, having lost an electron, is positively charged. As moving electrons pass silicon impurities, however, they are slowed by their attraction to the positive charge. They may even recombine with silicon and stop moving altogether.

Single Crystal Formed

To isolate these electrons from the parent impurity atoms, a team of researchers here came up with a technique for layering two semiconductor materials to form a single crystal. This was made possible by a crystal-growing process called molecular beam epitaxy (MBE), originally developed at Bell Labs about a decade ago, which allowed the experimenters to build crystals one layer of atoms at a time.

Raymond Dingle and Horst Stormer designed the layered structure. Then Arthur Gossard and William Wiegmann used MBE to grow sample crystals, controlling the composition of each layer.

They produced a crystal of alternating thicknesses of gallium arsenide and aluminum gallium arsenide: 50 atomic layers of one, followed by 50 layers of the other. The technique involved adding silicon — the donor of free electrons — to only the aluminum gallium arsenide layers.

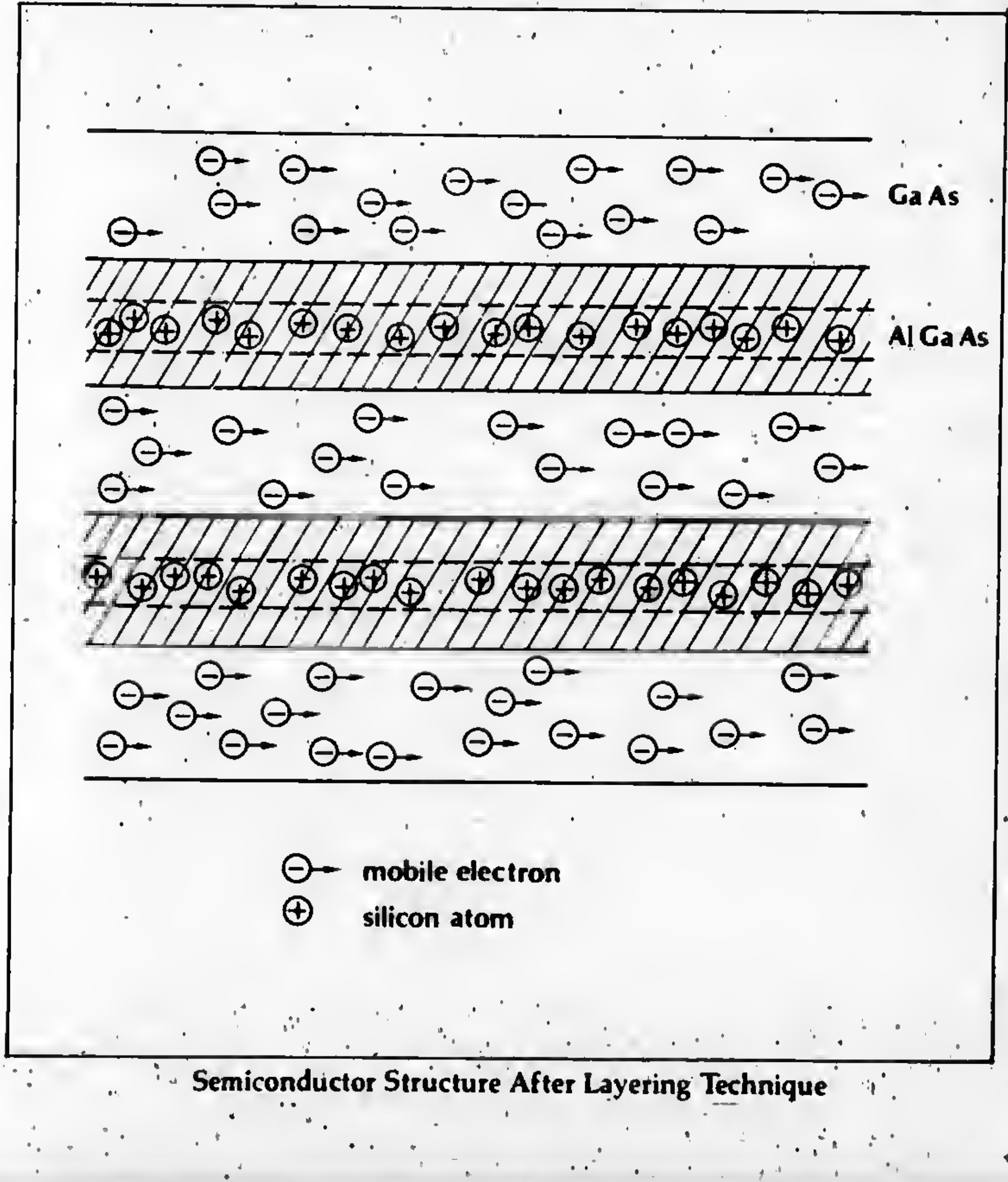
The key to the technique is that gallium arsenide (GaAs) and aluminum gallium arsenide (AlGaAs) provide different environments for free electrons moving through them; electrons are at a lower energy level in GaAs — a state they seek.

When silicon is added to AlGaAs, therefore, electrons migrate spontaneously to the GaAs layer. They leave behind the positively charged silicon, which remains in the AlGaAs layer.

The researchers further assured isolation of the electrons by adding silicon to only the middle region of the AlGaAs layers. This created "neutral borders" between the free electrons and silicon.

Once in different layers, silicon impurity atoms and electrons have little chance to interact. Electrons are then free to move more quickly than previously possible in GaAs — twice as fast at room temperature, 20 times as fast at lower temperatures, Bell said.

Furthermore, the technique is not restricted to these materials, the researchers said, adding that it will work for any combination of semiconductors with the same fundamental properties as GaAs and AlGaAs — about half the semiconductors currently under study.



Semiconductor Structure After Layering Technique

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IBM Chip Doesn't Worry Independent Makers

(Continued from Page 55)

gates are from whence we came," he observed. "Most makers have gone to silicon gates and double poly processes for increased density and smaller chip size."

However, IBM may be taking a tack "that will surprise us all," Hoffman said.

Mostek is working on a scaled MOS double poly process called Poly 5. While the technology is not radical, it is cost-effective, Hoffman noted.

"IBM's cost economies are different from those of our customers. Chip cost may not be a major concern for IBM," he suggested.

Because IBM is not selling the chips in the marketplace, the announcement was of little concern to Mostek, Hoffman said. He did admit, however, that the IBM product "has tweaked my curiosity."

EMM Not Worried

The development was also of little concern to Electronic Memories & Magnetics Corp., according to Len Kilfoyle, director of market development for its Computer Products Division.

"EMM's area of application is large-scale systems. We look at access time on a system. The access time for the 8100 is about 1500 nsec and the Series 30 is less than 200 nsec," Kilfoyle observed.

EMM is developing chips with cycle times seven times faster than IBM's 64K-bit chip, Kilfoyle claimed.

While he did not give a specific date when EMM would announce its 64K chip, he said "in the immediate future a 64K chip will be used in large system technology."

National Semiconductor Corp. had little to say about the announcement; not enough technical information on chip size and speed and other details are available to evaluate how good IBM's chip is, one spokesman stated.

David Martin, vice-president and general manager of the Computer Products Group, said National Semi isn't sure whether IBM is making the chip in-house or obtaining it from an outside supplier.

However, as far as 64K availability, Martin said National Semi will have 64K chips for sampling in the second quarter of 1979 and ship them in systems during the last half of next year.

Spokesmen for Fairchild Camera and Instrument Corp. and Intel Corp. declined to comment on the IBM announcement.

MIT Head Sees Technology Key to Future

(Continued from Page 55)

dent that one day all of them will provide energy, but only after considerable new development."

Weisner is convinced that the fear of new technologies such as nuclear power, computer systems and genetic engineering have their origin in real problems that must be faced.

However, "it is becoming increasingly difficult to develop any of the needed technologies fast enough to meet our problems because of their growing maturities and the size and complexities of the industrial and governmental systems into which they must fit," he observed.

Three-Part Focus

Weisner urged a "focus" on three aspects of technology: first, an "examination of the concerns of some people about the impact of technology; second, a cybernetic view of the role of science and technology in a modern industrial society and third, a look at the growing social management and feedback systems that are evolving to prevent future technological innovations from having serious undesirable consequences.

"Many commentators of the contemporary scene . . . believe democratically governed industrial societies are doomed," he warned. They believe the combination of resource shortages, overly complex systems and the growing confrontational style of dealing with societal problems condemns us to a future of rapidly declining affluence and rule by dictatorial governments instead of democracies.

"This is a possible consequence of our present tendency . . . [but] not inevitable because many forces are working to correct the problems that lead to their gloomy conclusions," Weisner said.

He insisted that "increased use of information technology is already helping to better manage those aspects of society that caused so much trouble in the past and still worry so many thoughtful observers of the contemporary scene."

Weisner's background includes service to both Presidents Kennedy and Johnson as science adviser, chairmanship of the Congressional Technology Assessment Advisory Council, 25 years on the MIT faculty, a doctorate in electrical engineering and a reputation as an authority in communications science and engineering, microwave theory and radio and radar propagation phenomena.

Gentronix and A-OK Settle With AMD

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD), Gentronix Corp. and A-OK Electronics, Inc. have settled their litigation in the U.S. District Court for the Northern District of California.

The settlement calls for payment by Gentronix of an undisclosed sum to AMD and provides for a permanent injunction against dealing in integrated circuits bearing an imitation AMD logo.

Attention—Operators and Systems Programmers:

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Tuesday	October 31	New York
Wednesday	November 1	Chicago
Thursday	November 2	Chicago
Friday	November 3	Detroit
Monday	November 6	Boston
Tuesday	November 7	Saddlebrook, New Jersey
Wednesday	November 8	Washington, D.C.
Thursday	November 9	Tulsa, Okla.
Tuesday	November 14	San Francisco
Wednesday	November 15	Los Angeles

Agenda

Morning—For Operators

Introduction

—Overview of Monitoring Methods
—Background versus real-time monitoring
—Problems with real-time monitoring
—OMEGAMON approach to monitoring

OMEGAMON Exception Analysis

—Why jobs are waiting
—Monitoring TSO response problems
—Catching looping jobs and TSO users
—Reasons for console lockouts
—Explanation of *enqueues* and *reserves*
—Hardware problems

Afternoon—for Systems Programmers
NEW PRODUCT ANNOUNCEMENT—EPILOG
(See Page 31 October 16 issue of Computerworld)

—Monitoring disks: reserves, head movement, dropped ready
—Introduction to SRM (changes with MVS/SE)
—Case histories of MVS monitoring experiences

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Morning Session ____________
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Overseas Export Promotion Events

TRADE FAIRS:

Seoul (Solo)	Computers and Peripheral Equipment	Aug 1980

INTERNATIONAL MARKETING CENTER (IMC) EXHIBITIONS:

Melbourne	Computers and Peripheral Equipment	Apr 1979
● Paris	Business Equipment and Systems	Jun 1979
● Milan	EDP USA '79: Computers and Peripheral Equipment	Jun 1979
● Singapore	Computers and Peripheral Equipment	Jul/Aug 1979
* Munich +	SYSTEMS '79: Computers and Peripheral Equipment	Sep 1979
* Stockholm +	DATA KONTOR: Computers and Peripheral Equipment	Sep 1979
* Birmingham	INTERNATIONAL BUSINESS SHOW: Business Equipment and Systems	Oct 1979
* London	COMPEC: Computers and Peripheral Equipment	Dec 1979
● Sydney	Business Equipment and Systems	Feb/Mar 1980
* Paris +	PRINTEMPS INFORMATIQUE: Computers & Peripheral Equipment	Apr 1980
* Brussels +	COMPEC EUROPE '80: Computers and Peripheral Equipment	May 1980
● Milan	EDP USA '80: Computers and Peripheral Equipment	May 1980

TRADE CENTER EXHIBITIONS:

Tokyo	Computers and Peripheral Equipment	Nov 1978
Sao Paulo	Computers and Peripheral Equipment	Feb 1979
Teheran	Computers and Business Equipment	Mar 1979
Mexico City	Computers and Peripheral Equipment	Nov 1979
Taipei	Computers and Related Equipment	Jan 1980

CATALOG EXHIBITIONS:

Basel	INELTEC: Computers, Electronic Production and Test Equipment, and Electronic Components	Oct 1979
New Delhi, Bombay, Calcutta and Hyderabad	Computers and Peripheral Equipment	Jan 1980
Bangkok, Kuala Lumpur and Jakarta	Business Equipment and Systems	Jan 1980

● IMC Onsite Exhibition
+ Tandem Exhibition
* U.S. Pavilion at International Trade Fair

For further details on any of the above events contact:
Roy Mitchell, Tel: (202)377-2838 or Peter Ryan, Tel: (202)377-2849

Commerce Releases Trade Show Schedule

WASHINGTON, D.C. — The computer industry is one of 15 industries targeted by the U.S. Department of Commerce for intensive export support. The department selected the industries based upon technological competitiveness and high sales potential abroad.

To assist firms with foreign marketing efforts, the Commerce Department organizes and sponsors a variety of overseas trade shows. Special emphasis is placed on assisting small and medium-sized firms.

The department has mounted 21 exhibitions and trade fairs which will take place between February 1979 and May 1980 (see box above).

Another service for the target industries is the "Global Marketing Survey," a publication prepared by the department that offers product-by-product analysis of major world markets for each target industry product group.

One of the first 1979 exhibitions, slated for March, will take place in Tehran, Iran. According to an analysis made by the Commerce Department, there are excellent opportunities for computer sales in Iran.

An indication of the Iranian market, according to the department, is that computer placements increased rapidly from 63 in 1970 to more than 300 this year. Between 1973 and 1976, Iran's gross national product more than doubled, creating an acute need for management information systems and software, Commerce noted.

More information on the services offered by the department is available from Roy Mitchell, U.S. Department of Commerce, Industry and Trade Administration, Washington D.C. 20230.

Supershorts

Prime Computer, Inc. has opened a sales office in Stamford, Conn., to support Prime's sales and support activity in New Haven and Fairfield counties in Connecticut and Westchester and Rockland counties in New York.

— — —

Clapp & Poliak, Inc. has announced the formation of a new division that will specialize in sales and marketing of exhibit participation by U.S. and Canadian companies in overseas exhibitions. The division, Interexpo Consultants, is based in New York.

— — —

Action Communication Systems, Inc., a subsidiary of Plantronics, Inc., has announced Roadrunner Network Systems sales in excess of $4 million.

Oak Park Trust & Savings Bank of Oak Park, Ill., has signed a contract to extend its facilities management agreement with Western Union's National Sharedata Corp. for an additional five years. The contract is valued at $2.5 million.

— — —

Chubb and Son Ltd. of London has announced it has licensed Diebold, Inc. of Canton, Ohio, under Chubb's patents covering cash dispensers and automated teller equipment. Chubb received in return an equivalent license under Diebold's patents together with a cash payment of $650,000.

— — —

Shareholders of Ambac Industries, Inc. approved a merger of that company into a newly formed subsidiary of United Technologies Corp., Charles E. Beck, Ambac's chairman and president, announced.

— — —

Western Microsystems is the new division formed by Western Microtechnology Sales of Sunnyvale, Calif. The division sells computer-based peripherals and systems to both OEMs and end users in northern California.

— — —

Calma Co., a supplier of computer-aided design systems, has become an independent operating division of United Computing Systems, Inc. of Kansas City, Mo. The acquisition, approved by Calma shareholders, was made by United Telecommunications, Inc., the parent company of United Computing.

Datapoint Corp. has secured more than $1 million worth of orders for its automatic call distributor, Infoswitch/ACD, according to Daniel A. Hosage, senior vice-president and general manager of the Communications Management Products Division.

— — —

Memorex Corp. has changed the name of its Comdata Manufacturing Division in Irvine, Calif., to the Precision Plastics Division. The change was made to more accurately reflect the type of products manufactured there, including precision plastic components for use in Memorex computer and video tape products.

— — —

Graphic Resources Corp. has located a regional sales and distribution office in E. Hartford, Conn. The office will inventory the company's full line of computer plotter supplies and service in the Northeast.

— — —

Hughes Aircraft Co. firmed up the marketing structure of its microelectronic operations, which recently grew to two divisions. One of the two, the Microelectronic Systems Division, will move to new facilities in Irvine, Calif., while the other, the Solid State Products Division, will operate from the Newport Beach facility.

— — —

Sharp Electronics Corp.'s Calculator/Systems Division has formed a product marketing department for the banking and financial service industry. The department has been designated the Banking/Financial Systems Department and will be administered from Sharp's Paramus headquarters. The department's initial product entry is the BE-3500 teller machine, a compact electronic accounting machine designed for use as a stand-alone commercial bank teller terminal.

— — —

Computer Micrographics, Inc. plans to open a complete micrographics service center in Seattle, Wash. David S. Shanks, Micrographics' president, commented on another company matter: that total annual sales for the year ended Aug. 31 should approach $12 million, but that the company does not forecast earnings, and any projection to that effect did not come from company sources.

— — —

LDF Semiconductor has changed its name to Tasa, Inc. and has relocated to new facilities in Santa Clara, Calif. The name is an acronym for touch-activated switch arrays, a semiconductor-based technology created by the company.

— — —

Warrex Computer Corp. has formed a subsidiary, Software Systems, Inc., located in Plano, Tx.

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See "Data Communications Networks" in our November 27th issue.

Time was, the data communications user had a limited choice between using the public switched telephone network, or leasing private lines. But recent data communications developments are rapidly allowing the user to configure more flexible networks, with greatly increased transmission efficiency, and easy interfacing of terminals and computers to the network.

Computerworld's November 27th Special Report takes a close look at data communications networks, and how they are rapidly making distributed processing technically feasible (as well as affordable). Edited by Ron Frank, *Data Communications Networks* will examine standards for evaluating and establishing effective networks, with articles by vendors and users on design, control and maintenance of the various available networks. We'll also be talking about:

- *Terminal selection — getting the most work out of the right terminal.*
- *Private line vs. public data networks — how users can best utilize either [or both] systems.*
- *Switched networks — choosing between circuit switching, message switching, and packet switching.*
- *Configuring in the '80's — microwave transmission and satellite links.*

Whether you're presently involved with data communications, or just looking, our November 28th Special Report will be of special interest to you. And if you market data communications products or services — this is a good place to get the word out. Ad closing date is November 10, and your *Computerworld* representative can give you all the details. Or, to reserve space, call Terry Williams at (617) 965-5800.

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OEM Products

Tektronix Graphics Display Has 25-In. Screen

BEAVERTON, Ore. — Tektronix, Inc.'s Information Display Group has introduced a high-speed 25-in. graphics display to its GMA series of OEM computer displays. Priced at $12,000 for OEM single quantities, it will be available in January; quantity discounts are available.

The GMA125 displays 70% more information than the GMA102A and incorporates an extension of the DVST-with-refresh technology found in the other members of the GMA series, Tektronix said.

The display's large information capacity and other enhancements suit it for computer-aided design and manufacturing, publishing and automated cartography, according to a spokeswoman.

Complex circuit board layout could not be done on the 19-in. display, she added.

The larger visual angle of the 25-in. screen allows the resolving of adjacent points that could not be distinguished on a 19-in. or smaller display, she said, and increases the number of screen size alternatives available to the OEM product designer.

The GMA125 is fully compatible with other members of the GMA series at the analog interface.

The Option 42 vector generator and Option 43 vector/dot character generator transform digital signals from most computers to the analog signals required by the basic display. These options provide a parallel interface that is fully compatible across the GMA series.

A parallel interface permits significantly higher throughput speeds than a serial (RS-232) interface, Tektronix said. These options are said to reduce the time it takes an OEM to electronically integrate the display into its product.

The Option 42 vector generator offers 12-bit addressing resolution for over 12.6 million viewable picture elements. This is state-of-the-art performance unduplicated in this price range, the company claimed.

The high-efficiency switching-type power supply of the GMA125 is energy-saving and lightweight; it also provides inherent compatibility with 220V and 50 Hz sources for international applications, according to the spokeswoman.

The GMA125 chassis is a symmetrical structure so the entire unit can be rotated if a designer needs a vertical long axis format. It can be mechanically integrated into the OEM's product with any degree of tilt.

Tektronix's Information Display Group can be reached at Delivery Station 60-715, P.O. Box 500, Beaverton, Ore. 97077.

Itel to Market Tape Systems Made by Hitachi

SAN FRANCISCO — Itel Corp.'s Data Product Group has entered into an agreement with Hitachi America, Ltd., a wholly owned subsidiary of Hitachi Ltd., to market Hitachi-manufactured, IBM-compatible high-speed magnetic tape subsystems.

The subsystems will be marketed on a worldwide basis by Itel to its Advanced System users and to IBM and IBM-compatible CPU end users.

"The magnetic tape subsystems obtained under this agreement, the Itel 7803-22 controller and the 7420-22 tape drive, are functionally compatible with IBM's 3803-II controller and their respective 3420-8 drive," according to John Clark, president of the Data Products Group.

"Itel's tape subsystem is designed to give our Advanced System and IBM-compatible users advanced technology, improved reliability and superior price/performance at substantially less cost," he said.

Initial customer deliveries of the Itel tape subsystem, priced at $28,500 for the tape drive and $46,750 for the controller in the U.S. and Canada, are scheduled for the third quarter.

Seminar to Eye IBM in DDP

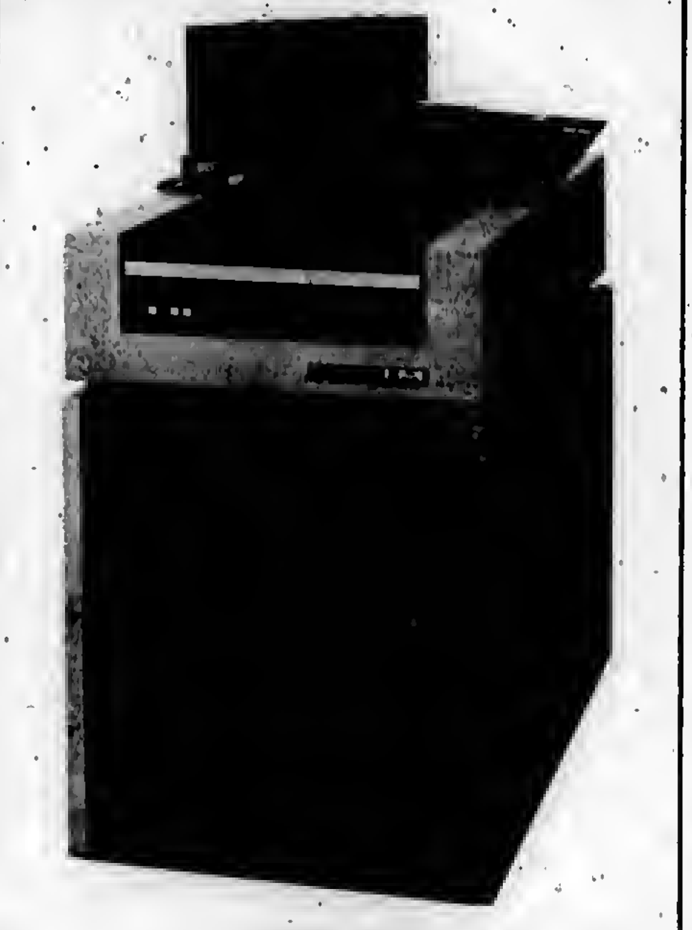
SAN JOSE, Calif. — SBS Publishing will hold a seminar on IBM products in distributed data processing (DDP) Nov. 13-15 in Palo Alto, Calif.

The evolution of DDP as a concept and practice will be explored in terms of the market's current status, and the outlook for older IBM products will be examined, according to an SBS Publishing spokesman.

Current IBM products will be viewed in their roles for business and communications applications, the spokesman said, and emphasis will be placed on IBM's Series/1 and System/34 minis as well as communications products.

The conference will also consider IBM's probable financial and political strategies over the next five years.

The tuition for the course is $495, including all seminar materials, notebook, lunches, breaks and cocktail party, SBS Publishing said from Suite 190, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.



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When you join the Atlantic Operation, you will immediately enter a level of project involvement possible only in a new, dynamic organization like ours. You will be able to contribute in every aspect of a project, from customer liaison and problem definition through final product development and user support. You will employ such sophisticated software techniques as top-down analysis, code walk-throughs, and automated development tools.

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Only recently incorporated, Atlantic Operation's primary objective is to design and develop real-time computer based systems to resolve unique problems within the commercial telecommunications industry. The software engineers who have joined us have helped to determine the scope of our endeavors by the influence of their abilities, interests, and ambitions. We currently seek professionals with similar talents and goals to augment these efforts.

We are looking at all levels for dedicated, talented software professionals with BS or MS degrees, real-time programming experience, and familiarity with languages such as PL-1, Assembly, ALGOL, or PASCAL.

Make contact with the Atlantic Operation today; if you are looking for total involvement and career growth, it will be only the beginning.

Send resume and salary requirements to F.C. Brown, Sylvania Technical Systems, Inc., Atlantic Operation, 140 First Avenue, Waltham, Massachusetts 02154.

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Excellent salary, liberal fringe benefits, in a country setting in central N.J., 370/148, DDS/VS/CICS. Minimum of 3 years COBOL experience is required.

Send resume and salary requirements to:

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Data Base Consultant

Central N.J. consulting firm with international clientele has immediate need for individual with detailed knowledge of IMS DB/DC or DL1/CICS. Previous teaching and/or consulting experience helpful. Salary negotiable, extensive fringe benefits.

Reply
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797 Weshington St.
Newton, Mass. 02160

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EXCELLENT OPPORTUNITY

If you have a minimum of 2 years experience in systems programming and a working knowledge in either MVS/JES2, VM/CMS, MVT/HASP, ASSEMBLER, PLI or TOTAL with exposure to other data base software we are interested in talking with you.

You will be involved in systems training, developing and debugging software and act as a consultant in providing technical support in the correction of deficiencies and the design of new systems.

Interested candidates are asked to send resume to Mead Corporate Staff Personnel, Dayton, Ohio 45463.

An Equal Opportunity
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Mead

SYSTEMS ANALYST

We are seeking several key individuals capable of assuming project management responsibilities for the development and implementation of large scale sophisticated banking systems. Initial assignments will be in such areas as EFTS, Central File, and On-Line Teller systems.

These are non-programming positions, however, candidates should have a programming background preferably in an IBM DOS environment. Experience with on-line systems and CICS is desirable but not required.

If you are interested in a challenging opportunity, personal growth and earnings potential limited only by your ability, and the contentment of working in a pleasant midwestern city, please contact:

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Manager Technical Services, MVS, D/C	to $37K
Systems Programmers, OS/VS, MVS	to $28K
Senior Systems Analysts, Inventory	to $25K
Programmer Analysts, COBOL OS	to $23K

Salaries commensurate with experience. Relocation and travel expenses paid. Respond in confidence to Toby S. Brimberg.

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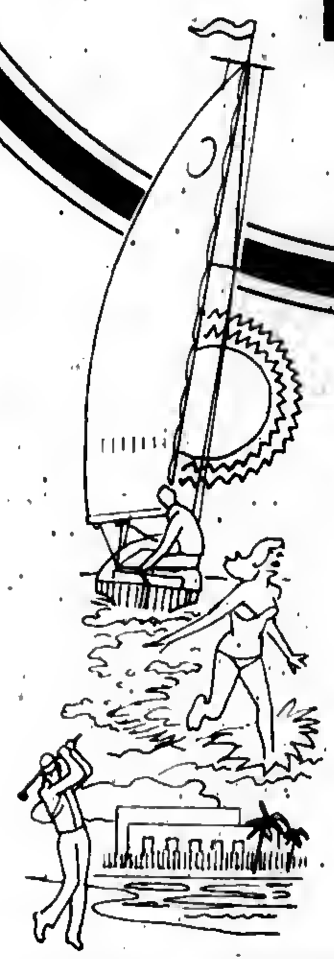

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You'll be joining one of NCR's most advanced and fastest-paced organizations, and entering rapidly expanding projects of the very highest visibility. You'll be working with the kind of high achievement professionals who have staked out a dominant position for NCR in the business and financial EDP markets. Show leadership ability and you'll find opportunities for advancement.

Due to our large number of openings there is excellent likelihood of finding exactly the position that fits your background and interests. We have immediate openings at middle and high levels requiring 2 or more years of software experience in the following areas.

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- Minicomputer operating systems
- Assembly language

If our professional environment is stimulating, so is our living environment. We're in Torrey Pines—a mile from the ocean and half an hour away from La Jolla or downtown San Diego. To arrange a full briefing send resume and salary history to: Cesar Namba, Employment Specialist, NCR Systems Engineering/Torrey Pines, Dept. J50, 4045 Sorrento Valley Blvd., San Diego, Calif. 92121.

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We are a well established and rapidly expanding software firm. Our positions offer competitive salaries and benefit packages with unlimited growth opportunities. We have immediate openings for more than 50 career positions in Europe, Middle East and Continental United States. Individual requirements are listed below.

PROGRAMMERS AND ANALYSTS with 1-7 yrs Honeywell 6000/L-66 COBOL experience, IOS, OM-4, TP are a definite plus.

PROGRAMMERS/ANALYSTS having hands-on experience with 1401 SPS to work with state-of-the-art translator or group.

JR. PROGRAMMERS/PROGRAMMERS with 1-4 yrs experience in COBOL.

HONEYWELL 6000 SR. APPLICATIONS PROGRAMMERS/ANALYST with 4-6 yrs experience in COBOL, IDS, TDS, ISP.

ENTRY LEVEL PROGRAMMERS with COBOL training.

SYSTEMS PROGRAMMERS with 5 + yrs Honeywell 6000/L-66 GCOS/GMAP experience. Should be able to read slave and master mode dumps.

PROGRAMMERS/ANALYSTS having hands-on experience with 7080 AUTOCOOER to work with state-of-the-art translator group.

FORTRAN PROGRAMMERS with 2-4 yrs experience preferably on DEC 10.

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MINI-COMPUTER PROGRAMMERS with assembly language experience (HIS L/6 preferred)

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These positions generated by our continuing expansion require a B.S. Degree in Business, Computer Sciences, or related field (or equivalent) and 3-5 years' experience on large 370/148 or 158 IBM computers. You should also have the ability to work independently and use teleprocessing and data base techniques on MIS projects. Exposure to transaction processing systems and knowledge of COBOL, IMS or TOTAL are desirable. You'll be involved with the design, development and implementation of information systems in areas such as on-line sales office administration systems and financial and personnel data base.

We offer excellent salaries and liberal benefits which include relocation assistance if necessary. If you're interested and qualified, please send a resume including salary history and requirement in confidence to: Manager of Professional Employment, 2558 Alcoa Building, Pittsburgh, Pennsylvania 15219, or if you have any questions call (412) 553-2219. Alcoa is an equal opportunity employer. (No Agencies Please)

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Memory Design Engineers

Participate in the design of our add-on and stand-alone systems with three to seven years background in dynamic mainframes, controllers, PC Board logic using MOS & ECL technology. These systems require IBM CPU interfaces, hardware, software and internals knowledge.

Material & Production Control Planners

Background for this position should include three to seven years in Material & Production control techniques, such as analysis of Marketing & Sales, will forecast production build schedules, process the MRP for material buys, P. O. cancellations, etc. Will interface with other production and material control groups, purchasing, Quality Assurance and Engineering Services.

Quality Assurance Supervisors & Engineers

Requires BSIE/BSEE and/or two to ten years experience in Q. A. Engineer positions including planning product releases, spec writing and establishing guide lines in a QA functional environment. Technical understanding in the administration of Mil Spec 217B, reliability prediction, NTBF, failure analysis in a commercial environment field performance summaries, memory boards and systems analysis.

Opportunities exist in General Systems and Computer Systems. PC Board evaluation techniques a plus. The mini and micro computer groups emphasize commercial assembly, PC board loading, commercial specifications and Quality Procedures.

Sustaining Engineers

Should be well versed in the design and manufacture of field installation cycle of new computer memory products. IBM 370 experience desired with two to five-years experience in the design, troubleshooting documentation and field maintenance of general digital systems.

Engineering Designers & Supervisors

Must be familiar with ANSI 632.16 (Electronic REF designation and y14.5 Dimensioning and Tolerancy), capable of completing accurate layouts and able to do worse case dimensional analysis. Requires two to ten years experience in Electro-Mechanical packaging with two to five years in lead design and layout. Supervisory positions should include at least two years of direct supervision of design and drafting personnel.

Technical Illustrator

Three to five years as a Senior Illustrator in the electronics industry. Create technical ink renderings of the electronic and mechanical assemblies and sub-systems.

Hardware Technical Writers

Three to ten years experience writing technical manuals, associated with computers and/or computer products. Must be capable of reading logic drawings, schematics and have knowledge of a hexadecimal numbering system. Will collect technical information regarding IBM compatible memory systems and transpose information into installation instructions, Theory of Operations, Wire lists, and Maintenance Manuals, etc.

Manufacturing Engineers

Two to seven years Manufacturing Assembly Support (assembly methods Documentation of sub-assembly, final assembly Harness and cable, PCB fab, workmanship standards, Vendor Fab processes, material review board). Will transfer new products from Development Engineering into Manufacturing.

Test Engineers

Responsibilities include writing test procedures, analyzing products; assigning test standards, and doing memory systems test design modifications on new equipment.

MICRO COMPUTER SYSTEMS

Computer Hardware Design Engineers

Requires three to ten years experience as a senior, intermediate or junior systems design engineer with a BS, MS, PhD EE, Computer Science, Math, or Physics degree. Will design microprocessors, mini systems, using logic design techniques, component selections establishing design parameters. Experience with analog circuitry and power supplies for one position: the other involved with Electro-Mechanical Processor packaging (i.e., chassis design layout).

Product Repair Center Manager

Will be responsible for the complete set-up and operation of a product repair center for mini computers in the United States. Individual should have two to five years in systems test of computers plus supervision of a medium sized group of technicians. Also responsible for logistics supplies and operations to get computers repaired and back to customers.

SOFTWARE DEVELOPMENT

Operating Systems Designers

Participate in the design, development and validation of state-of-the-art real time operating systems. Familiarity with firmware implementation of OS primitives and structured design techniques preferred.

Language and Compiler Specialist

Will be involved in the design and implementation of language processor using PASCAL, FORTRAN, BASIC and COBOL. Knowledge of compiler optimization techniques, systems implementation, languages and high level language support via firmware is desired.

Systems Utility Specialist

You should understand design techniques for interactive text editors, micro assemblers, linking loaders, symbolic debuggers, file utilities and device utilities.

Diagnostic Systems Design Specialist

Senior position offers challenging systems design opportunities involving micro diagnostics and on-line diagnostics, running under and operating system. Responsibilities include design implementation and documentation of complete diagnostic systems for detecting and isolating hardware failures.

INTERNAL MARKETING

Marketing Product Management

Experience in pre and post sales support of mini or micro software systems and support of major OEM mini or micro software products, with emphasis on customer contact and interpersonal relations. Technical degree or equivalent experience; plus two to five years in computer systems environment.

Product Mangers OEM

Requires two to five years marketing in micro and mini computer systems OEM environment. Background in software and hardware systems integration a plus. Will define and implement market plans for OEM modules into small computer systems market. Other duties will be product definition, market survey, advertising, P. R., long range planning, and sales training.

Product Specialist

Requires field or home office experience in technical administration functions required to support mini computer type business. Good interpersonal relations and customer interface skills. Will prepare proposals, do systems analysis, design and configuration control.

Product Support Specialists

Requires operating system level software experience and ideally, hardware development and microprocessor or minicomputer experience. Also required is a strong marketing knowledge (people-oriented). You will interface with customers, sales and product management.

LARGE SYSTEMS - SYSTEM 400

System Support Representatives

Requires technical degree and three to five years as Technical Support on computer systems and related products. In depth knowledge of microprocessors. Demonstrated capability of supporting field engineers and customers. Will become familiar with hardware systems in order to assist in initial engineering efforts, support OEM field engineering organization.

Technical Trainers

Three to five years teaching (Lecture Lab) and course development in-depth knowledge of microprocessors and working knowledge of various manufacturer's hardware. Demonstrated capability of conducting an orderly and professional classroom. Will develop courses around existing hardware including materials used, conduct classes, and act as back-up for technical support.

Microprogramming Specialists

To work on CPU's controllers and emulations, creating original as well as emulating microcode. In addition, involved with telecommunications systems. Strong background in IBM operating systems, VTAM, BTAM, and QTAM. Some knowledge of systems network architecture with DOS and VM/370. Technical degree plus two to seven years program design. Working with multiprocessor and microprogrammed machines a plus.

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Now you can compare your current salary with hundreds of other computer professionals working in or near your geographical area. Source Edp, North America's largest recruiting firm specializing in the computer field, has just compiled a timely survey of local salaries in the computer profession. The survey covers all areas of professional discipline in programming, software, information systems, marketing, etc. It shows salaries by length of experience, size of installation and includes all management levels. You can also compare your current compensation on a city by city basis with salaries paid in metropolitan areas across the U.S. and Canada as well as national averages.

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If unable to call, write: Source Edp, Department C
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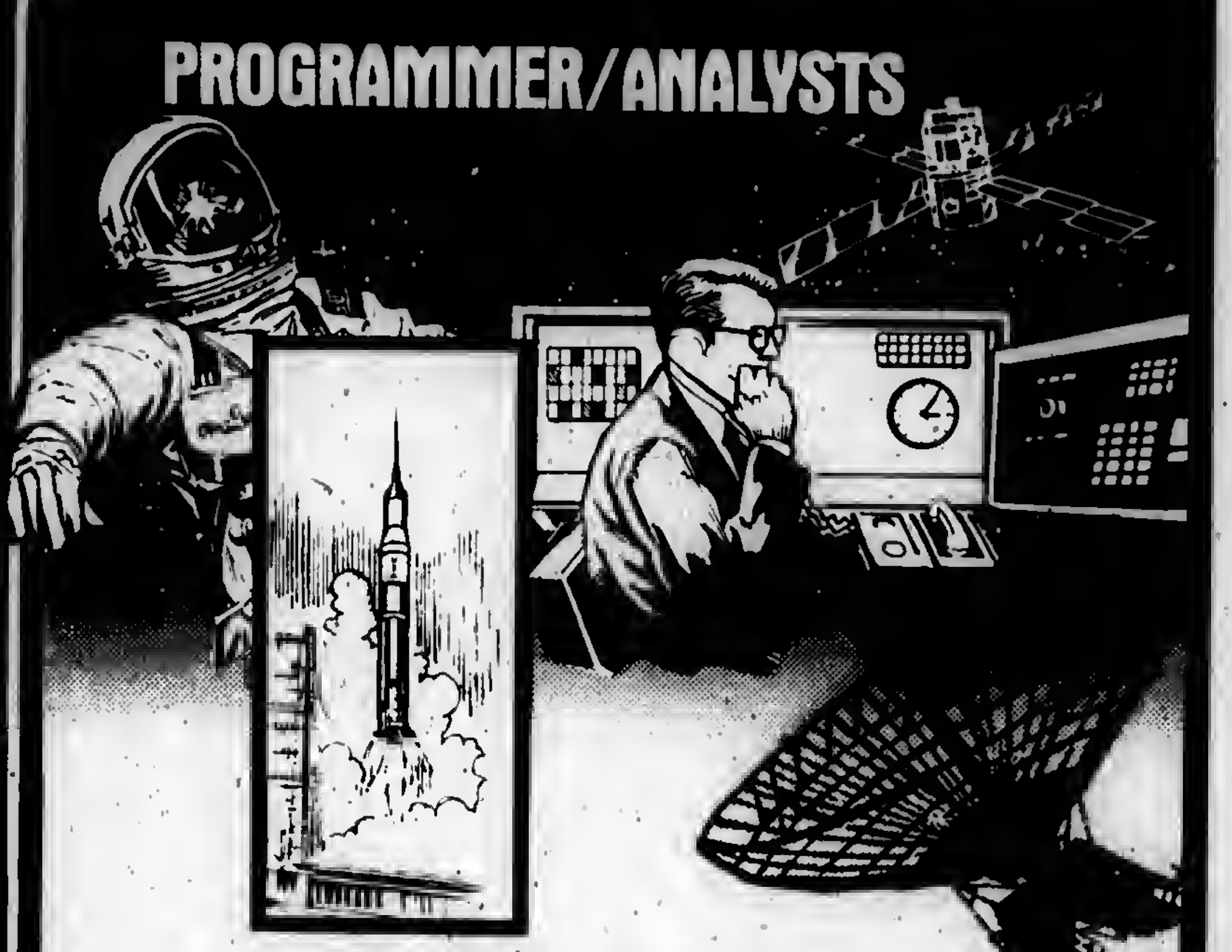
(When writing, please be sure to use home address and indicate position title.)

CSC

PROGRAMMER/ANALYSTS



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Minimum of one years experience as senior programmer with financial institution: prefer savings and loan.

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Will participate in the support and enhancement of major areas of the 3033 operating system. Prior support experience desired in the areas of I/O device support, virtual memory management, CPU scheduling or file systems.

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Will install, maintain, and enhance compilers and other parts of the operating system. Prior VS, VM, or MTS support experience desired.

NETWORK DEVELOPMENT COORDINATOR:

Will participate in the design, implementation, and support of a multi-CPU communications network, using X.25 protocols on PDP-11 and 3033 equipment. Prior experience desirable: communications equipment; DEC; 370 hardware and software.

HARDWARE AND COMMUNICATIONS SPECIALIST:

Will design and implement specialized communication, data acquisition, and related computer hardware and software. EE degree preferred. Microprocessor and programming experience desirable.

STATISTICAL CONSULTANT:

Will assist faculty and students on computer software (SPSS, BMDP, MIDAS, etc.) and statistical procedures. M.S. degree in statistics required. Experience with consulting, programming, and appropriate statistical software desirable.

Salary is open depending on experience. Send resume, 3 professional references, and salary requirements to: Manager of Recruitment, RPI, Pittsburgh Building, Troy, New York, 12181.

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$32,000. Many opportunities depending on individual's experience level and geographical requirements. Atlanta division of major computer manufacturer — many new systems being implemented: Phoenix — direct access methods for multi-design units; Tennessee — recommend and implement new DB System for an expanding organization. All positions offer excellent opportunity and are open due to growth and promotions. Clients are interviewing now!

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This important liaison position between customers and sales calls for a professionally motivated individual who enjoys being mobile and dealing with people on a continuous basis as well as becoming actively involved with installation, implementation and customer instruction at system sites throughout the mid- and upper midwest states. 40-50% travel is essential.

This position calls for excellent communications skills, a thorough familiarity with OS/DOS, 2-3 years systems or application programming background, a knowledge of COBOL and/or BAL and on-line programming and/or data base knowledge. A good understanding of PAN-VALET, EASYTRIEVE and/or PANEXEC would be considered essential for success. Of utmost importance is the combination of well-defined career goals and a creative approach to problem-solving.

In addition to an excellent salary and benefits package, the selected candidate will receive indepth training in state-of-the-art software technology and open-ended opportunities for career growth. For consideration, send a resume to Tarie Yee, PANSOPHIC SYSTEMS, INC., 709 Enterprise Drive, Oak Brook, IL 60521, or

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Join a small close knit working organization where freedom of expression and individuality are encouraged, where you don't have so many layers of management that you wonder who's running the shop, where you actually meet the people who use your services and where you have the satisfaction of seeing the end result of your efforts.

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OS/VS-1 CICS, DL1

Programmer Analysts (3)

COBOL, CICS, DL1

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Southwest
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Attention:
Paul Becker

OPERATIONS SUPERVISOR

A progressive retail firm is seeking an individual to supervise computer operations. The center operates an NCR C-251 in both batch and on-line environment. The ideal candidate will possess above average communicative skills and an ability to identify and solve problems. Responsibilities include: personnel supervision, system research, work scheduling, interfacing user departments, and the coordination of hardware maintenance. Please submit resume and salary history in confidence to:

Personnel Department
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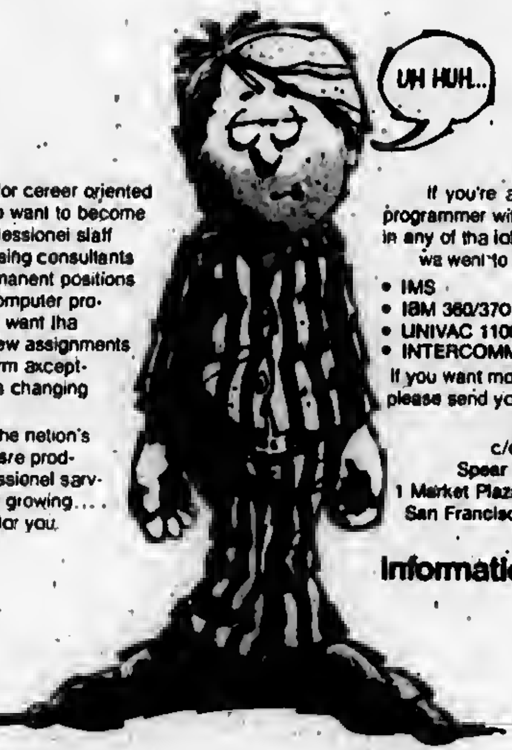

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Assist state and local government agencies in:

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Perform statistical analysis of justice research data. Requires degree, 1-3 years recent FORTRAN experience, familiarity with statistical packages (e.g., SPSS), and experience with quantitative research techniques.

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- **Documentation.**
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Research Associate

Participate in criminal justice research project of national importance. Requires Ph.D. in Social, Behavioral or Management Sciences or Master's degree and 3-5 years of research experience. Other requirements include familiarity with advanced statistical techniques and research methodology, and effective communications ability.

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- Research and development of Complex Digital Image Processing Systems utilizing state-of-the-art hardware, software, algorithms, and techniques.
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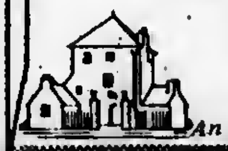

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PROGRAMMER/ANALYST

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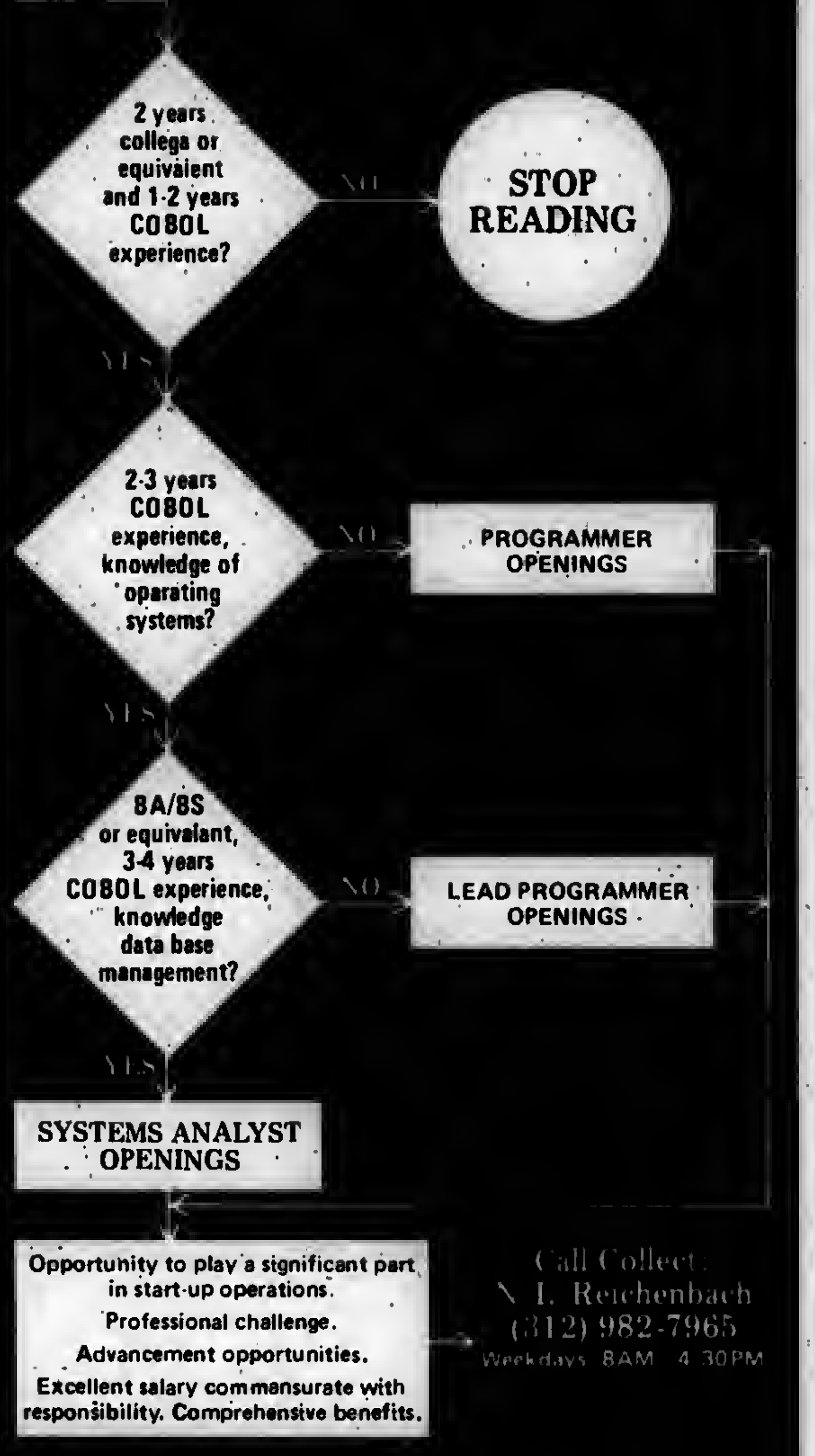
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Chairman, CCC Director Search Committee
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Research, write, edit and produce technical publications: specifications, manuals, handbooks, and newsletters. Must have experience in data researching techniques, using such sources as interviews, project notes, working papers and existing publication. Should be knowledgeable of specification format.

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Prepare and teach training to CCI personnel and customers. Subjects to include Micro-Programming, Telecommunications, Micro-Computer Internal Logic and Operations.

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To apply submit salary history and resume to:

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Professional Staffing (TS86T)
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Scope of this position is the design of hardware in PCM transmission and switching.

If you are interested in advancing your career and are expariencad in any of tha abova area, we would appreciate hearing from you. For more information, ptease sand completa rasuma or call: Tom Edminson, ITT Business Communications Division, 2000 South Wolf Road, Des Plainas, Illinois 60018

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ITT Business Communications Division

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The position, Engineering Programmer Analyst, is located in the Atlanta office which houses the systems data center. Position requires an Engineering Degree with knowledge of power plant operation and maintenance. Minicomputer experience as well as structured analysis and design techniques are desirable. Individual should also be proficient in COBOL programming. Company offers career opportunity, excellent benefits, relocation and competitive salary.

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Personnel Department
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for Kent County

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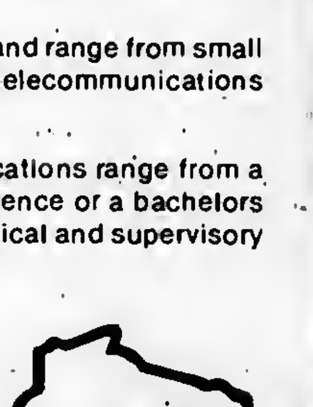

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—MINNEAPOLIS—	
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—SAN FRANCISCO Bay Area—	
Programmer Analysts	$15-25K
—GEORGIA (Small Mountain Resort Town)—	
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—ATLANTA—	
IMS Database Designer	$20-22K
—DALLAS—	
Data Center Mgr.—Medical	$25-30K
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CTS
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Salary is $16,000-$19,000. For more information or to apply, contact William W. Oay, President, Cantrat Wyoming Collaga, Rivarton, Wyoming 82501. Oaadline for applications is October 30, 1978. An Equal Opportunity Employer M/F

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Major job functions will require you to support communications software in a TCS/VS/CICS environment, and analyze and resolve technical problems. Your background should exhibit a detailed and complete comprehension of VS operating systems, TCAM knowledge, 3-5 years systems programming experience in an OS/VS shop, specific knowledge of CICS internals and SMP, good verbal and written communications skills, and a willingness to perform goal maintenance skills.

SYSTEMS PROGRAMMER

Responsibilities encompass planning, generating and maintaining VS related software, analyzing problems in VS areas, and assisting the TP on-line area in testing and development. Proper job performance will require a technical knowledge of VM and its support, technical project leadership, 2-4 years OS/VS systems programming and development, basic communications knowledge, and the ability to supervise less experienced personnel.

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Your two or more years of OS/VS BAL programming will be called upon to maintain and assure the operating systems' PTFs, as well as make the necessary corrections. Additionally, this position will involve continual product and research development, assisting the TP on-line group with fixes and code changes for TCS, TCAM, and Securities/Commodities Order Match. This position requires OS/VS HASP technical skills, knowledge of VM, ability to evaluate software problems and associated areas, and good verbal and written communication skills.

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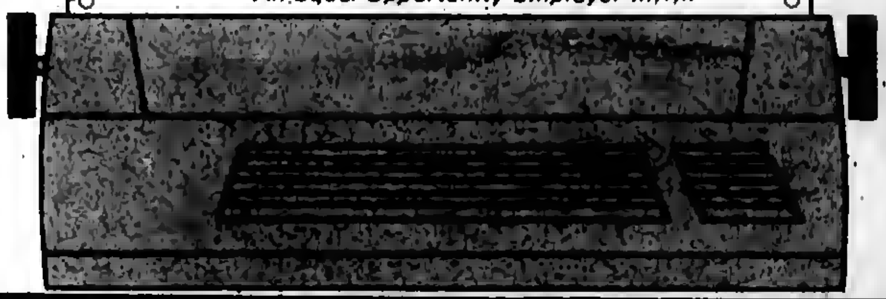

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If you're looking for achievement with a dynamic, people-oriented Company, send your resume to C. Horn, Professional Employment, FOUR-PHASE SYSTEMS, 10700 N. De Anze Blvd., Cupertino, CA 95014. (408) 255-0900. Equal employmant opportunity is our pledge & practice. No agencies, please.

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Date Processing

Assoc. Data Processing Dir.

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Past administrativa axperienca is not necassery, but e commitmant to daveloping such skills is essential.

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Qualified candidates who would be interested in a career with us in Venezuela should call or send a resume to Cerl Utley at 570 Lexington Avenue, Room 1910, New York, New York 10022, telephone (212) 750-3249.

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Excellent salary, outstanding company paid benefits, positive career advancement, professional growth, top management visibility, 4½ day work week.

Our corporate data center is in Greenville, South Carolina, one of the nation's top municipal areas for future career opportunities (Fortune and Money magazines). We have remote sites in Houston, Texas and Raleigh, North Carolina.

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Personnel Director

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Technical Analyst

System House Marketing

This position requires a person experienced with minicomputers and IBM 360/370 system software, COBOL, BASIC and RPG II languages, file management systems, and communications. Should also have experience working with OEM System Houses. This is a marketing position working with senior vendor analysts, making technical presentations and demonstrating WANG products to new vendors. Some travel will be required.

BURLINGTON EDUCATION CENTER

The expansion of the Center's programs requires personnel in the following areas:

Training Specialist - Computer Systems

Your responsibilities will consist of educating customers, systems analysts and Marketing staff in the operation of our business systems. You will have an opportunity to be creative and develop curriculum associated with these products. This position requires a person who is a self-starter and who has 2-3 years experience in the following areas.

- **Instructional experience in hardware and/or VS Operating Systems.**
- **Knowledge of interactive or time sharing systems.**
- **Field experience as a Systems Analyst/Programmer with Business Applications knowledge.**
- **Programming experience in COBOL, RPG II and/or BASIC or all three languages.**

Instructional Design/ Course Developers

Your responsibilities will consist of researching, developing ideas and writing course materials associated with both Computer and Word Processing programs. You will have an opportunity to work with existing course trainers, Marketing personnel and other important groups to formulate the needed materials for implementation into offered courses for Sales, Customer and internal Marketing organizations. This position requires a person who has 2-3 years experience in the following areas:

- **Development experience - course design through implementation.**
- **Prefer knowledge of Computer/Word Processing or related industry.**
- **Creative writing skills.**
- **Ability to work with various organizations and take on project responsibilities.**
- **Prefer college education or specialized training in this area.**

Training Specialist - Data Communications

As a specialist in Data Communications, you will be responsible for relating concepts, and in-depth knowledge of this subject, to Sales, Customer and internal Marketing personnel. Your knowledge should consist of Hardware Interface as well as Software capabilities.

This position requires a person.

- **Who has 3 years experience in the following areas:**
  - **In-field implementation of communications systems.**
  - **Training - experience in development of communication Modules.**
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  - **Ability to take project responsibility to implement the program.**

If you have the necessary qualifications and are interested in this growth position, we want to speak with you.

Excellent salaries and benefits.

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The Boston Edison Company is presently seeking Programmers/Analysts for its Systems and Computer Services Department. Responsibilities will include assisting in planning, organizing, and defining requirements within one of the following assigned functions:

- System Planning Studies
- System Analysis and Programming
- Software or Systems Programming
- Data Base Administration
- Telecommunications Design and Coordination
- Designing, Installing and Monitoring of Systems and Applications

Degree required, preferably in Computer Science, Math, or Accounting, plus a minimum of three years of Data Processing experience and exposure to the Accounting field or a related business function.

Please forward resume in professional confidence to Boston Edison Company, Office of Employment, 800 Boylston Street, Boston, MA 02199.

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Murphy, Symonds & Stowell, the Northwest's oldest and largest Executive Search Firm, is currently representing several National and local manufacturers in the Data Processing and Electronics Industry. Positions available are at the Sales Executive, Branch Manager and Regional Manager level. Some positions are in the Seattle/Portland area and others Nationwide. These are quality positions requiring good track records in the D.P./Electronic industry. If you have really done something in your career worth talking about, call me in Seattle at (206) 623-6790. Gery Etchells.

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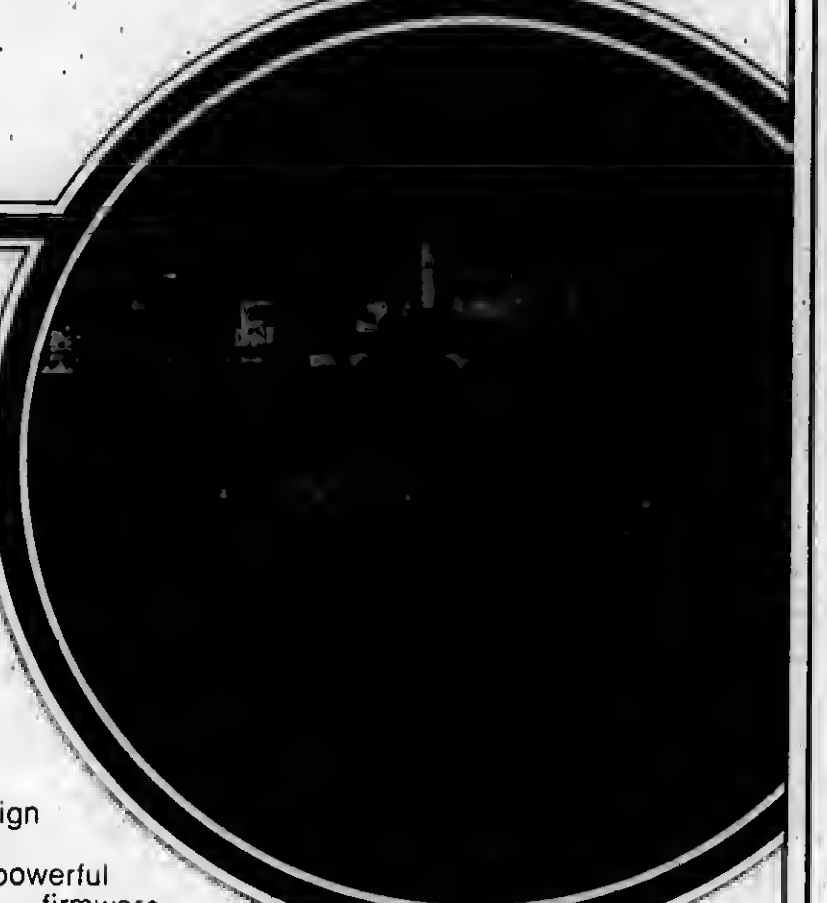

You'll find the facilities themselves impressive: extensive buildings that cover a whole hilltop overlooking one of California's most attractive living and recreational areas.

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NCR/SD is engaged in the design and construction of large-scale computer systems embodying powerful new concepts: virtual systems . . . firmware emulation . . . PASCAL — based OS language. . . VLSI technology . . . and other advanced developments.

The work we do has a strong impact on NCR's market position, provides high visibility for professional achievement, and offers experience in the new computer technologies that we are using to anticipate business EDP needs in the 80s.

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Immediate openings in many areas: If you have an engineering or computer science degree (or equivalent) and a year or more of experience in one or more of the areas listed, contact us at once.

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The Navajo Tribal Government, located in rural northeast Arizona has immediate openings for experienced DP professionals: Systems & Program Mgr., Sr. Systems Analyst, Systems Analyst and Lead Programmer. Experience in Business systems and COBOL required? HP-3000 Data Base experience desireable. Salaries in the 20's. Send resume to Joanna Schmidt; Drawer 644; Window Rock, AZ. 86515.

MGR. INFO. SYSTEMS

New Eng. recreational area industrial seeking indiv. to direct all D.P. activities and staff of 25+. IBM/DOS installed. Salary to $26,000. (Fee paid.) Contact Stan Durbas.

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The County of Humboldt is looking for two Programmer/Analysts to work in a Burroughs B4700-MCPV environment. Progressive applications utilizing state-of-the-art technology. Minimum qualifications include any combination of education and experience equivalent to graduation from college and two years experience in programming and analysis. COBOL, data base, and data communications experience preferred. APPLICATION DEADLINE: Nov. 10, 1978. Resume to: Personnel Dept., County of Humboldt, 825 Fifth St., Eureka, Calif. 95501. An Equal Opportunity Employer

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Manager-Computer Services

Career position available for a Department Manager in the Computer Services Department of a large consulting engineering firm. Job responsibilities include administration and management of the computer systems and activities for both the headquarters office and branch offices, management of a professional staff, establishing department goals and priorities, work scheduling equipment selection, and preparation of department budgets and operating plans. This position reports to Corporate Management.

Applicants must have progressively responsible experience in managing personnel and computer systems with appropriate knowledge and skills in computer programming for both engineering and business applications.

This position offers an opportunity to combine career growth in an expanding firm with an excellent living environment in a small metropolitan area, located near major metropolitan centers, yet offering numerous recreational and cultural opportunities.

Salary commensurate with experience.

Send resume to:

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COMPUTER & INSTRUMENTATION DIVISION

Has immediate openings for:

OPERATING SOFTWARE PACKAGES DEVELOPMENT ENGINEERS

1) – BS degree with major in Computer Science. 3-5 years systems programming experience on an IBM 370 or 303X Computer using either DOS/VS or OS/VS1.
2) – IBM Assembler language experience including the following:
   – Ability to design and write complex and efficient Assembler applications.
   – Generalized physical IOCS disk applications for all disk device types.
   – System Macro design and coding.
   – Re-entrant and/or real-time routines.
3) – Verbal/written communication skills on how developed programs function.

If you qualify, please send resume in complete confidence to: Mr. W.J. Young, Manager, Personnel Relations, Westinghouse Computer & Instrumentation Division 1200 W. Colonial Drive, Orlando, Florida 32804

Westinghouse

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GW SAVINGS

Great Western, with assets over 8 billion dollars and 106 branches, has one of the largest Savings and Loan terminal networks in California. Our Data Processing Center, located in southern Orange County, has ideal working conditions, operating in a multi-CPU environment with VS1 under VM/370. We need qualified candidates for the following new openings in each of our data processing application areas.

SYSTEMS SUPPORT

• Systems Programmers

For system generation and support of CICS. Good knowledge of CICS internals a must. 3-5 years assembler language programming. Experience in VSAM, VTAM, and NCP helpful but not required.

APPLICATION SYSTEMS DEVELOPMENT

• Savings

Learn and utilize structured analysis/design and programming techniques. Programmer/Analysts to assume responsibility for major maintenance, enhancement, and documentation of Savings system. 3-5 years assembler language programming experience in an OS environment. Finance or accounting experience or 4 year college degree desirable.

• Loans

Openings for Programmer/Analysts with 2-5 years experience using assembler language programming in an OS environment. Thorough knowledge of OS JCL essential. Responsibilities include program development and enhancement for the batch and on-line loan systems. Financial background helpful.

• Financial

COBOL Programmer/Analysis to maintain and enhance Financial applications. Responsible for developing new computer programs to provide major level system enhancements in accordance with user requests. 3-5 years COBOL in an OS environment. College degree or equivalent experience in finance/accounting field. Assembler language programming experience helpful.

• Insurance

Programming support for the company's new on-line insurance system. Minimum two years programming experience using RPG, COBOL, and/ or assembler language programming in an IBM OS environment required. Familiarity with insurance systems and CICS would be helpful.

• Payroll/Personnel

Programmer/Analyst needed to assume responsibility for payroll/personnel. Will research and analyze user requests and respond to system problems. Requires good communication skills. 2-4 years COBOL programming experience in an IBM OS environment. Thorough knowledge of OS JCL. College degree preferred. Payroll/personnel application experience helpful.

We offer generous health and dental benefits, a savings incentive plan as well as several banking privileges, excellent educational opportunities, and growth potential in our data processing organization. Please call or send resume referring to specific position desired, with salary history and requirements to:

Ms. Nancy Williams (714) 759-4865 or Ms. Gloria Doyle (714) 759-4779

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SYSPROG, MVS, heavy BAL	OPEN
SYSPROG, DOS, TOTAL/E1	to 22K

These positions are all in FLORIDA. We also have many in other sunbelt areas. For immediate attention & results, contact Len Paydan, Division Manager

HAYDEN-MITCHELL ASSOC.
EDP Division
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A new position in the Portland area for a professional in EDP communications. The task is to assist in the design and initiation of a network providing the capability for inquiry, response, and update of a major data base. Applicants should have sound knowledge of common carrier facilities and services and be competent to evaluate hardware and software alternatives in communications architecture. Salary in low twenties.

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Position available for person experienced in systems analysis, systems design and programming on DEC PDP 11/70 systems utilizing RSTS/E operating system, BASIC and COBOL Languages.

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Personnel Department
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Statistical training, familiarity with SPSS or other statistical programs beneficial. Starting salary range $17 - 23K, depending upon qualifications

SUBMIT RESUME WITH SALARY REQUIREMENTS TO:

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If you possess a BS/MS in Computer Science/EE, or equivalent and knowledge of assembly language and operating systems; you may be eligible for one of these challenging positions in the design of programming systems for an extensive communications network.

The openings are located in Massachusetts and provide the foundations for growth in one of the most exciting areas of computer technology — Distributed Systems. You will be working at leading edge of technology in an environment which provides complete systems exposure plus the autonomy to pursue individual initiatives.

Send your resume in complete confidence to Sally Silver; Winter, Wyman and Co; 60 William Street, Wellesley, Massachusetts 02181 or call Sally at (617) 235-8505. Collect calls accepted.

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Personnel Consultants
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Wellesley, Mass. 02181
617-235-8505

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1 Senior Level Position
1 Junior Level Position

Major NYC organization developing and implementing full scale computer security program. Program will include risk analysis, contingency planning and application auditing.

Knowledge of IBM OS/VS operating systems, ANSI COBOL, accounting, risk assessment and data security techniques are desirable.

Competitive salary and excellent fringe benefits. Send resume and salary history in confidence to:

Director
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Newton, MA 02160

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Mutual of Omaha, a leader in the insurance industry for over fifty years, is undergoing significant growth in our Computer Data Services Division. We offer professional careers in the technical, systems, administrative, and management areas of data processing.

We have an outstanding Career Progression Program and complete In-house Training Program to provide our employees the opportunity to develop in the area most suited to their career objectives.

Applicants with at least one to five years' experience using COBOL or BAL in an IBM 370 environment are preferred. An insurance background is also helpful.

If you are interested in pursuing a career with us, send your resume in strictest confidence, including salary history to:

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all disciplines, internals, T.P. & applications. For these and other super positions, submit resume with current salary. Our good client firms located central, East & West coastal areas seek qualified candidates.

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RCA CONSUMER ELECTRONICS MANUFACTURING/MATERIALS SYSTEMS ANALYST

Opening exists for a Junior Analyst with a minimum of 3 years COBOL programming experience preferably in the Manufacturing or Materials Application area. Individual will be working with a Division wide Data Management Systems environment. Successful candidate will have a Bachelor's degree in Business Administration or Computer Science and have system analyst design experience.

SR. SYSTEMS ANALYST

Immediate opening exists for an individual with 3-4 years systems design experience in business systems. The area of design responsibilities would encompass Sales and Financial Planning, Order Processing, distribution and marketing statistics. BS/BA preferred – Computer Science degree acceptable. Three years COBOL experience is required.

RCA offers these opportunities along with excellent benefits and compensation. For immediate consideration, send your resume and salary history to: RCA Consumer Electronics, Att: A.J. Walters, 600 N. Sherman Drive, Indianapolis, IN 46201.

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RCA

SYSTEMS PROGRAMMER

Univac 1100

RCA Consumer Electronics has challenging opportunity for a System Programmer to work with Univac 1100 operating system. Position requires a minimum of 2 years experience in areas of systems generation, JCL, assembly language, ANSI COBOL; FORTRAN, systems processors and systems performance monitoring and tuning. Demand, batch, remote batch and real-time processing are used to support this 1100/22 multiprocessor system.

We offer competitive salary, a comprehensive benefit package, and a full range of growth opportunities in the systems/programmer field. Work location is division headquarters in Indianapolis, Indiana.

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Professional Employment, 6-207

RCA Corporation

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RCA

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ROI Controls Corporation, PO Box 3131, Princeton, NJ 08540

- **Mini-Micro Specialists**
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Requires 1½-2 years COBOL, ALC, or PL-1 in a commercial environment. On-line applications and telecommunications desirable.

Sr. Systems Programmer Teleprocessing

Positions require background in systems design and support of an extended BTAM based teleprocessing monitor. EXCP experience required. Must have background in systems architecture, mathematics and queueing experience.

Sr. Systems Programmer Operating System

You should have 7 years' total data processing experience, including 5 years' background working with operating system plus 2 years' experience as a lead programmer. Requires heavy VM 370 and CMS internals experience or MVS and/or MVT. You must have excellent written and verbal communications skills.

Staff/Senior Programmer Analyst

Positions require minimum 3 years COBOL, ALC, or PL-1 in a commercial environment. On-line applications and telecommunications required.

Associate Systems Programmer Teleprocessing

You should have 5 years total data processing experience including 2-3 years TP experience in OS environment. Background to include ALC, TP access methods (prefer BTAM, EXCP) and a working knowledge of OS internals.

Associate Systems Programmer Operating System

We require 5 years' total data processing experience, including 3 years' working with operating systems, OS, MVS and/or MVT. Background should include ALC, SYSGEN, Utilities and OS internals experience or training.

Equipment configuration features an Amdahl V-6 and dual 370/158s running under MVS program development using TSO and SPF. The company offers excellent starting salaries and top benefits, including 3 weeks vacation. Relocation assistance is provided. The environment is conducive to development and participation. Please send your resume or letter of interest to Duff Wenz:

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900 Front St.
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DATA PROCESSING OPPORTUNITIES $17-21,000

We are a Fortune 200 leader in the food industry with corporate offices located in a pleasant Midwestern town. Because of our dynamic growth, an expansion mode exists in our MIS department. We invite you to be part of that expansion which includes state-of-the-art technology in information processing. The following positions are available:

PROGRAMMER ANALYSTS

A minimum of 2 years COBOL programming experience and at least one year in systems design. Team leadership responsibilities a plus.

PROGRAMMERS

A minimum of 2 years COBOL experience on large-scale hardware. Structured programming is a plus.

Our compensation program includes a liberal cash bonus and is accompanied by a benefit program that includes profit sharing and stock options. Send detailed resume and salary history to:

CW Box 1735
797 Washington St., Newton, Ma. 02160.

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SYSTEMS PROGRAMMER

- Help with MVS from MVT conversion following installation of ITEL AS/6.
- Do performance measurement, tuning, user support, production, programming, and more.

We're the nation's largest independent operating telephone company. And the first telephone company to introduce a "paperless Business Office" system. Our computer system ranks as one of the most advanced and innovative in the country, constantly moving ahead.

This opening requires at least 2 years in systems programming on OS/VS 370 with internals training. MVS internals, SYSGEN, VSAM, and/or TUNING experience desirable. Alternatively experience in MVT, TSO, HASP, TOTAL-DBMS or ENVIRON-1 will be considered.

Rochester, with about a million area population, offers exceptional big-city resources without big-city problems, especially in the arts, housing, education, and recreation from water sports to skiing. Please send resume, with salary data, in confidence to Paul Lewis.

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DATA PROCESSING PROFESSIONALS

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Programmer Analyst-Commercial/Service COBOL, IMS, TSO, VSAM	FLORIDA	$21,000
Systems Programmer-TCAM Intervals, ASP Version 3, JES 3, MVS	CONNECTICUT	$25,000
Sr. Programmer Analyst-Manufacturing, on-line systems IDMS, CICS	OHIO	$23,000

All expenses including fees and relocation are paid by our client companies. For further information regarding these and other opportunities available . . . . NATIONWIDE . . . . . Please call or write Joseph Miglizzi, CEC, (203) 249-9177.

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Weber Marking Systems is a growing multi-division international company with corporate offices and major manufacturing operations located in Arlington Heights, Illinois. We are the leader in the industrial marking equipment industry and have been in business over 45 years.

Exceptional career opportunity for a talented individual to develop and coordinate technical, marketing and field support programs on a regional basis relative to a plug compatible on-line computer peripheral product. Candidates should have a minimum of 1 year experience in a technical and/or marketing support activity involving IBM plug-to-plug computer terminal equipment and other data communications peripherals. A good working knowledge of the concepts behind on-line software such as CICS and various data communications line protocols would be beneficial. Occasional travel required.

We offer an excellent salary and comprehensive benefit program. For immediate consideration, please submit a complete resume including salary history to:

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SYSTEMS PROGRAMMER

IBM 370/158, OS/VSI,RES INTERCOMM, VSAM, BTAM

Amway Corporation requires an experienced systems programmer to participate in the installation/maintenance of IBM operating systems software. The planned migrations to MVS on a 3033 computer requires an individual with systems programming experience in OS/VSI or SVS or MVS. Related responsibilities will include system generation, system performance, measurement and tuning, system modification and installation of software packages. A competitive salary, comprehensive benefit package and real opportunity for advancement are offered. Please submit resume in confidence to:

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This is newly created position reporting to the Executive Director of a 500+ bed hospital in Western Michigan. Position responsibilities include coordinating all activities relative to the processing of information in a hospital to achieve uniformity and simplification and promote operating efficiency. The scope of the position covers all hospital operations and will require direction and coordination of internal and external resources in electronic data processing, manual systems and procedures, industrial engineering and forms control.

Qualifications desired include 5-8 years of experience in information systems with some experience in the health care field. Demonstrated ability to solve broad organizational problems using a systems approach, knowledge of the applications of computer systems and industrial engineering techniques in a hospital environment, and experience in dealing with top management personnel are essential.

An individual with management consulting experience in the hospital information systems area will receive prime consideration.

Your resume will be handled in confidence by a public accounting firm engated to assist in identifying and evaluating candidates. Send your resume with salary history to:

CW Box 1731
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Programmer Analyst

Location: Work in central California's beautiful San Joaquin Valley, 90 miles from San Francisco. This agricultural community is located 30 minutes from the foothills of the Sierra Nevada Mountains.

Job: Assist in the design, programming and implementation of distribution systems, operating on System 3 and System 34. Three to five years' system background, preferably in the distribution area, with heavy RPG II experience. CCP experience desirable. Must be willing to travel 25%.

Company: The world's largest wine manufacturer is offering an unusual career opportunity with real challenge and excellent rewards, including an outstanding fringe package. Starting salary commensurate with your experience.

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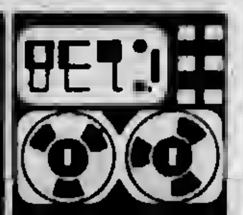

. . . A company whose past and future growth is based on a history of innovation. Our Phoenix Arizona facility is the focal point for several far-reaching data processing and data communications projects which will include multiple 3X systems in the near future.

Systems Programmers

Requires systems software implementation and modification experience, proficiency in machine language and IBM access methods. One position specifically requires MVS, JES2 internals with knowledge of SUPERWYLBUR, TSO, CICS and VTAM desirable. A second position specifically requires VS1 and CICS with VTAM, NCP and or VM helpful.

American Express Co.
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Phoenix, Arizona 85002

AMERICAN EXPRESS

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Republicsteel

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SENIOR SOFTWARE PROFESSIONALS

Ohio—Illinois

Republic Steel, a "Fortune 100" company is looking for substantial technical expertise in large IBM S/370 environments, knowledge of software internals and proficiency in generation and maintenance of operating systems along with significant backgrounds in a good mixture of the following areas:

- COBOL and Assembler Language
- DL/1 or TOTAL Data Base Systems
- TCAM or VTAM Internals
- CICS Internals
- 3705 Emulator, PEP or NCP
- Software Evaluation and Selection
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Effective verbal and written communications skills coupled with a Bachelor's Degree could qualify you for a challenging position with a company on the leading edge of Business Systems development.

Republic offers excellent salaries attuned to your expertise and exceptional company benefits. Convenient evening or weekend interviews will be arranged. For immediate consideration please send your resume in confidence,

c/o

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or call collect
(216) 574-4542
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Republicsteel

SOFTWARE ENGINEERING

San Diego Gas & Electric Co. has a vacancy for an individual with a background in process control software applications. The position offers an opportunity to participate in a multi-million dollar project to implement a new bulk power control system incorporating 32 bit computers for area-wide control of electric generation and transmission facilities. A technical degree and experience in assembly language and Fortran programming are required. Desire electric utility experience with familiarity with Operator Power Flow, Unit Commitment, Transaction Evaluation, AGC and SCADA. Assignments will include software development involving digital communications, man-machine interface applications and sparse matrix techniques. Please send resume and salary requirements to:

Employment Office
SAN DIEGO GAS & ELECTRIC CO.
P.O. Box 1831
San Diego, CA 92112

An Equal Opportunity and Affirmative Action Employer

FACULTY POSITION

Purdue University School of Engineering and Technology at Indianapolis.

An opening in the Computer Technology Department at Indiana University-Purdue University at Indianapolis (IUPUI) is available August, 1979. Applicants must have a strong background in mathematics, including statistics, with programming experience in FORTRAN. Teaching experience and a minimum of a master's degree are required. Industrial experience is preferred. Rank and salary dependent on qualifications. Closing date for receiving applications, including resume and three letters of reference, is November 30, 1978. Contact Dr. Robert G. Crozier, Chairman, Search and Screen Committee, IUPUI, 1201 E. 38th Street, Indianapolis, Indiana 46205

An AA/EOE

MOTOROLA MICROSYSTEMS

PHOENIX & AUSTIN

Motorola's Microsystems Group is a key leader in the design and marketing of microprocessor support systems that serve a wide variety of industries. We are expanding our EXORciser-based support product beyond the original 6800 to include new high performance 8-bit microprocessors as well as the exciting new 16-bit processor known as the 68000. Excellent opportunities are currently available for software engineers, hardware engineers, and product marketing engineers.

SOFTWARE ENGINEERS

Opportunities exist in real time operating systems, file systems, languages, and test and diagnostics programming. Qualified applicants should have 1-5 years programming experience with at least a BS in Engineering, Computer Science, Math, or equivalent experience. Experience with higher level language preferred.

HARDWARE ENGINEERS

All levels of experience. Will be responsible for logic design, test development, and release of micro-processor support modules for micro-module and EXORciser products. Familiarity with asynchronous bus architectures desirable. Special opportunities for individuals experienced in production test procedures and techniques. Qualified individuals should know assembly language and have at least a BSEE.

PRODUCT MARKETING ENGINEERS

Product marketing engineers to develop markets and sales of microcomputer systems and subsystems. Based in Phoenix, Arizona with approximately 30% U.S.A. travel. Should have engineering background and at least 5 years sales/marketing experience.

The above openings are currently available in scenic Austin, Texas and sunny Phoenix, Arizona. Phoenix offers all of the cultural advantages of a major urban area, but with a healthy outdoor climate and abundant recreational possibilities. Plus, you'll find low taxes, plentiful inexpensive housing, and a relaxed pace that sets us way apart from the hassles of bigger cities.

Beautiful Austin, Texas, considered one of the nation's ideal living places, boasts of a temperate climate, no state income tax and an unusually low cost of living. Generous company benefits are offered including a liberal relocation allowance.

You can build a solid career with Motorola, and discover, as well, a unique new lifestyle in the sun-filled, thriving Southwest. Interested and qualified applicants for either the Phoenix or Austin areas are encouraged to respond to the addresses below:

Motorola Phoenix, please send your resume in confidence to: Don Schepp, Professional Recruitment, EC-702, P.O. Box 20903, Phoenix, Arizona 85036, or call collect to (602) 962-3126.

Motorola Austin, please send your resume in confidence to: Jerry Fulton, Professional Recruitment, 3501 Ed Bluestein Road, P.O. Box 6498, Austin, Texas 78762, or call (513) 928-6868.

MOTOROLA INC.
SEMICONDUCTOR GROUP
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ONE OF THE REASONS HE GOT TO BE A FOREMAN AT HIS FULL-TIME JOB IS BECAUSE HE LEARNED TO BE A LEADER AT HIS PART-TIME JOB.

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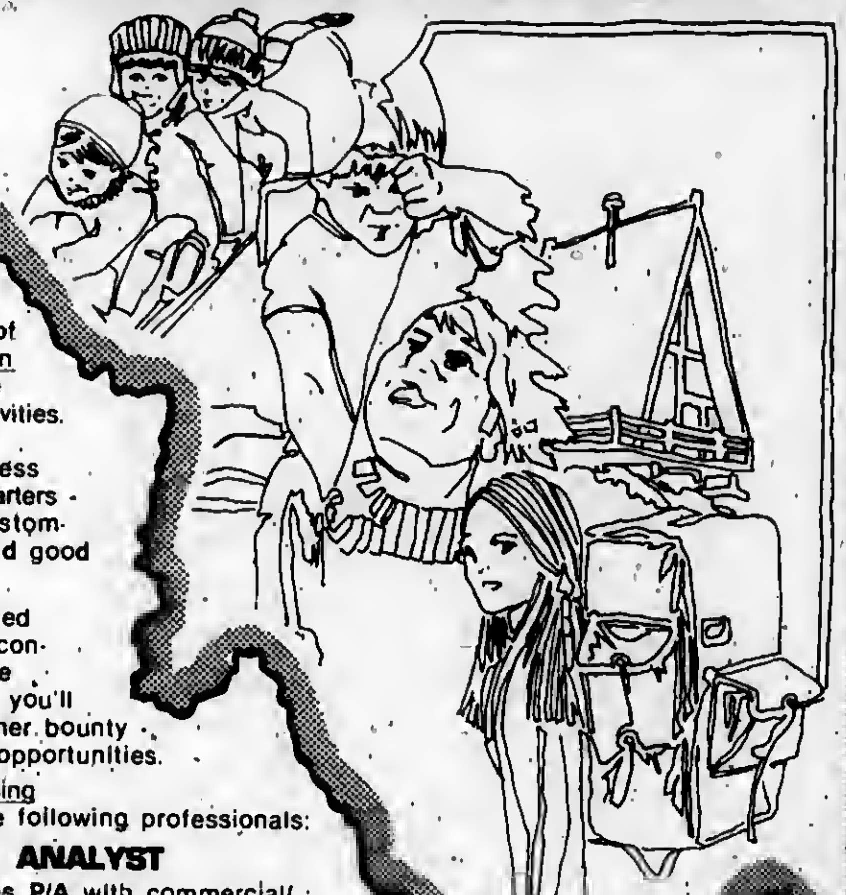

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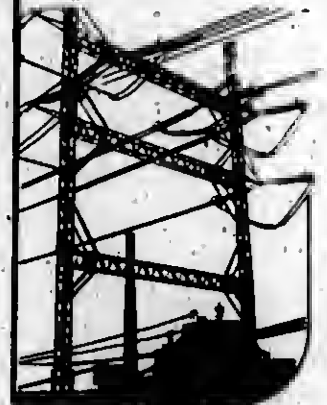

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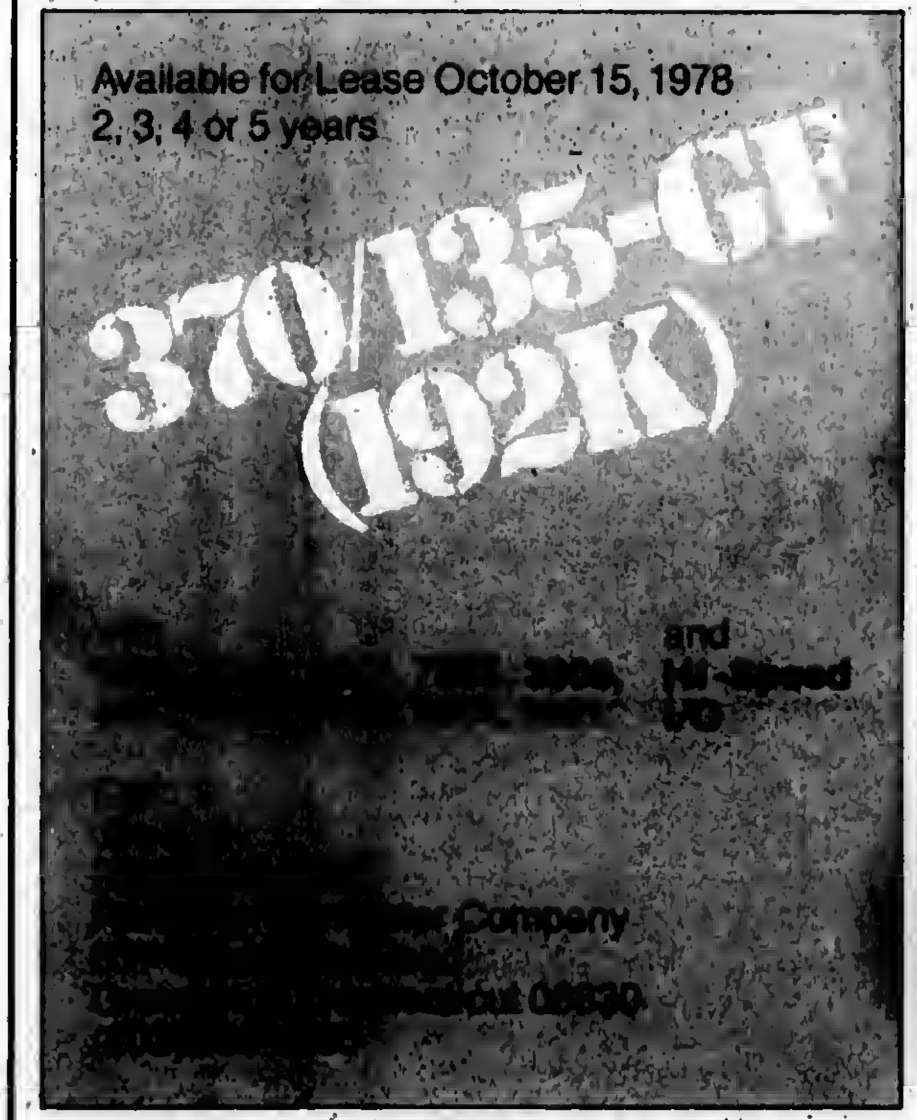
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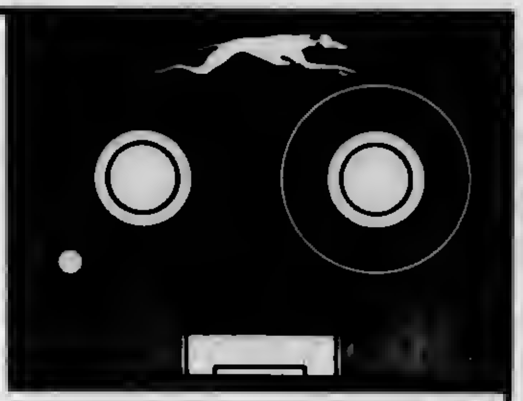

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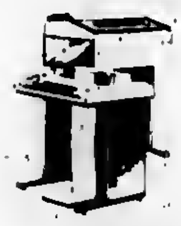

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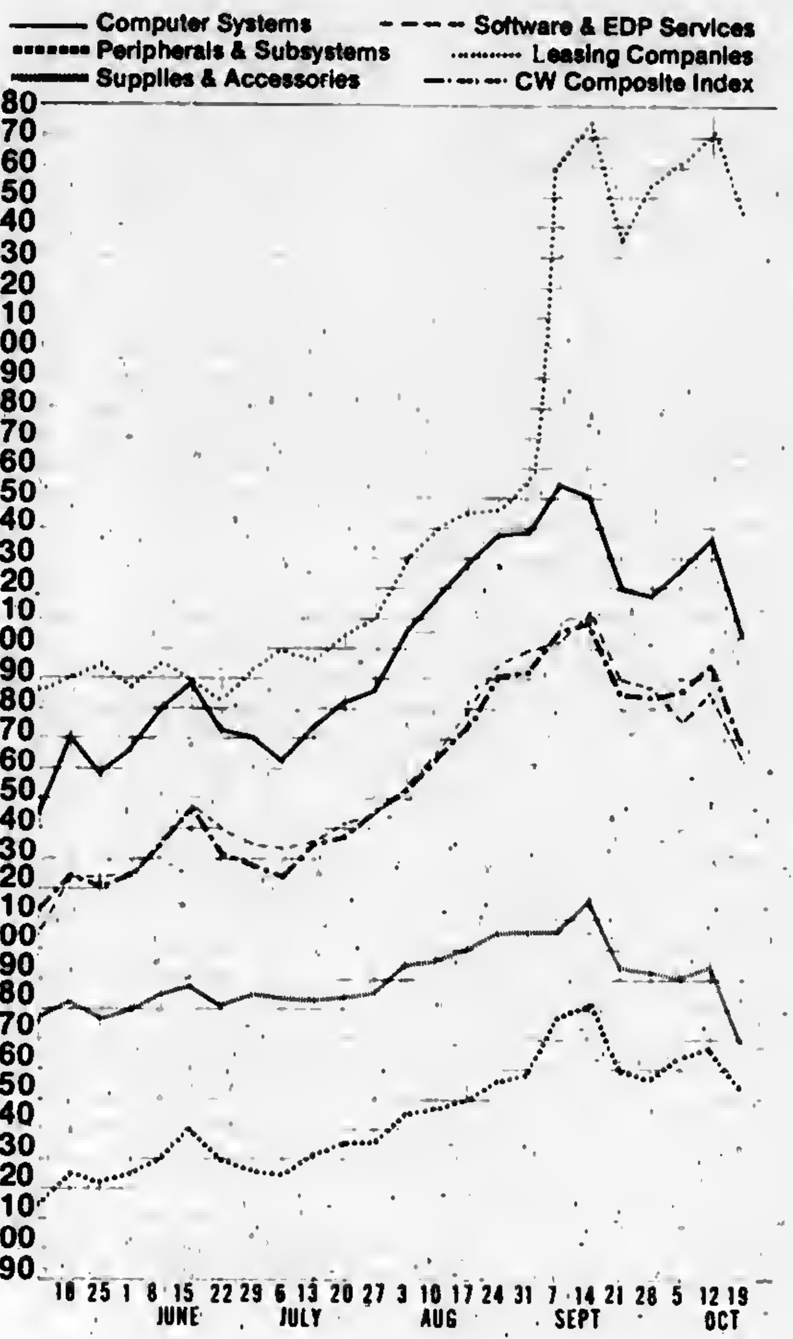

Earnings Reports

COMDISCO
Three Months Ended June 30

	1978	1977
Shr Ernd	$.75	e$.47
Revenue	42,815,357	18,248,195
Earnings	1,246,854	739,177
9 Mo Shr	1.85	a1.41
Revenue	101,104,204	85,505,363
Earnings	3,029,820	2,189,162

a-Adjusted to reflect 50% stock distribution paid in March 1978.

COMPUTERVISION
Three Months Ended June 30.

	1978	1977
Shr Ernd	$.38	$.27
Revenue	16,432,00	11,308,000
Earnings	933,000	843,000
6 Mo Shr	.69	.48
Revenue	30,260,000	21,805,000
Earnings	1,685,000	1,137,000

COMSHARE
Year Ended June 30

	1978	1977
Shr Ernd	$1.92	$1.30
Revenue	25,639,100	18,212,700
aSpec Cred	831,000	544,000
Earnings	3,413,300	2,018,600
3 Mo Shr	.53	.31
Revenue	7,320,200	5,237,300
eSpec Cred	159,000	111,000
Earnings	971,000	528,800

e-Gain from deduction of prior year's accounting expenses.

CAMBRIDGE MEMORIES
Three Months Ended June 3

	1978	1977
Shr Ernd	$.19	$.59
Revenue	2,938,000	1,840,000
Tax Cred	e149,000	a894,000
Earnings	337,000	994,000
9 Mo Shr	.49	2.37
Revenue	7,528,000	5,403,000
Tax Cred	e425,000	e3,662,000
Earnings	887,000	4,022,000

a-Includes gain of $779,000 in the quarter end $3,320,000 in the nine months from extinguishment of indebtedness end tax-loss carryforward credits of $100,000 in the quarter and $342,000 in the nine months.

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Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES WEDNESDAY, OCTOBER 18, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1978 RANGE (1)	CLOSE OCT 18 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	50 1/4	-6 1/2	-11.4
N	BURROUGHS CORP	59- 87	72 1/4	-5	-6.4
O	COMPUTER AUTOMATION	23- 44	26 1/4	-1 1/2	-5.4
N	CONTROL DATA CORP	23- 44	35 3/8	-3 7/8	-9.8
O	CRAY RESEARCH INC	21- 74	58	-9	-13.4
N	DATA GENERAL CORP	42- 71	59 3/4	-3 5/8	-5.7
N	DATAPOINT CORP	34- 75	60	-9 1/4	-13.3
N	DIGITAL EQUIPMENT	39- 54	47 7/8	-4 3/8	-8.3
N	ELECTRONIC ASSOC.	2- 13	8 1/4	-1 1/2	-15.3
A	ELECTRONIC ENGINEER.	11- 19	13 1/4	- 3/4	-5.3
O	FOUR-PHASE SYSTEMS	19- 46	35 3/8	-3 1/4	-8.4
N	FOXBORO	28- 40	35 1/2	- 1/2	-1.3
O	GENERAL AUTOMATION	7- 26	16 5/8	-4 5/8	-21.7
O	GRI COMPUTER CORP	1- 3	2 1/4	- 1/8	-5.2
N	HEWLETT-PACKARD CO	62- 93	85 1/4	-3 1/2	-3.9
N	HONEYWELL INC	43- 72	65 5/8	-4 3/4	-6.7
N	IBM	236-305	279 3/4	-10 3/4	-3.7
O	MANAGEMENT ASSIST	9- 29	20	-3 1/2	-14.8
O	MICRODATA CORP	10- 23	17 1/4	-3 1/4	-15.8
O	MINI-COMPUTER SYST	5- 8	6 1/2	- 3/4	-10.3
O	MODULAR COMPUTER SYS	7- 17	12	-1 3/4	-12.7
N	NCR	37- 67	64 5/8	-2 3/4	-4.0
N	PRIME COMPUTER INC	20- 43	33	-4 1/4	-11.4
N	PERKIN-ELMER	17- 28	24 1/2	-3 1/2	-12.5
N	RAYTHEON CO	29- 58	47	-4 1/2	-8.7
N	SPERRY RAND	33- 49	43 7/8	-2 1/4	-4.8
A	SYSTEMS ENG. LABS	11- 24	15	-2 1/2	-14.2
A	WANG LABS.	12- 32	23 7/8	-3 5/8	-13.1

LEASING COMPANIES

EXCH		1978 RANGE (1)	CLOSE OCT 18 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	13- 21	20	-1	-4.7
O	COMDISCO INC	5- 22	17	-3 3/4	-18.0
A	COMMERCE GROUP CORP	1- 1	5/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	3 3/4	-1 1/8	-23.0
N	DATRONIC RENTAL	1- 3	2 3/4	+ 1/4	+10.0
A	DCL INC	3- 5	3 7/8	- 1/4	-6.0
N	DPF INC	8- 14	12 3/4	- 5/8	-4.6
N	ITEL	16- 36	28 3/8	-5 1/8	-15.2
N	LEASCO CORP	24- 36	34 3/8	+2 5/8	+8.2
O	LEASPAC CORP	1- 4	2 1/2	0	0.0
A	PIONEER TEX CORP	4- 7	4 3/8	- 1/2	-10.2
N	U.S. LEASING	13- 20	17	- 3/4	-4.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		1978 RANGE (1)	CLOSE OCT 18 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/4	- 1/8	-9.0
O	ANACOMP INC	8- 22	14 3/4	-1	-6.3
A	APPLIED DATA RES.	8- 17	11 1/8	-2 7/8	-20.5
N	AUTOMATIC DATA PROC	24- 36	31	-2	-6.0
O	COLEMAN AMERICAN COS	1- 2	1 1/2	0	0.0
O	COMPU-SERV NETWORK	7- 12	8 1/2	- 1/2	-5.5
O	COMPUTER HORIZONS	1- 9	7 1/4	- 1/4	-3.3
O	COMPUTER NETWORK	8- 16	10 3/4	-1 1/2	-12.2
N	COMPUTER SCIENCES	8- 17	12 7/8	-2 3/8	-15.5
O	COMPUTER TASK GROUP	1- 4	4	+ 1/4	+6.6
O	COMPUTER USAGE	2- 4	3 1/4	- 3/8	-10.3
O	COMSHARE	6- 19	15 3/4	-2 1/4	-12.5
O	CULLINANE CORP	23- 33	23	-3	-11.5
O	DATA DIMENSIONS INC	4- 9	6 5/8	-1	-13.1
O	DATATAB	1- 2	1 1/4	0	0.0
N	ELECTRONIC DATA SYS.	15- 25	19 1/4	-3 1/8	-13.9
O	INSYTE CORP	1- 3	1 3/4	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3 1/4	0	0.0
O	KEANE ASSOCIATES	3- 6	5 1/4	0	0.0
O	KEYDATA CORP	1- 3	2 3/8	+ 1/8	+5.5
A	LOGICON	11- 19	13 5/8	-1 7/8	-12.0
O	MANAGEMENT DATA	1- 2	1/8	0	0.0
A	NATIONAL CSS INC	15- 36	26 3/8	-2 5/8	-9.0
O	NATIONAL DATA CORP	7- 13	9 7/8	-1 3/8	-12.2
A	ON LINE SYSTEMS INC	17- 30	22 3/4	-2 7/8	-11.2
N	PLANNING RESEARCH	4- 10	7 5/8	-1 3/8	-15.2
O	PROGRAMMING & SYS	1- 1	1 1/2	0	0.0
O	RAPIDATA INC	3- 7	5 1/2	- 1/2	-8.3
O	REYNOLDS & REYNOLD	18- 36	28 3/4	- 3/4	-2.5
O	SCIENTIFIC COMPUTERS	3- 9	7 7/8	-1 1/8	-12.5
O	TYMSHARE INC	18- 33	23 7/8	-5 1/8	-17.6
A	URS SYSTEMS	5- 8	7	- 5/8	-8.1
N	WYLY CORP	1- 7	5 3/4	- 1/2	-8.0

PERIPHERALS & SUBSYSTEMS

EXCH		1978 RANGE (1)	CLOSE OCT 18 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	23 7/8	-4 1/2	-15.8
O	ADVANCED MEMORY SYS	7- 18	13 1/2	-3 1/4	-19.4
N	AMPEX CORP	10- 19	15 3/4	-1	-5.9
O	ANDERSON JACOBSON	5- 10	6 5/8	- 5/8	-8.6
N	APPLIED DIG DATA SYS	12- 22	12 1/8	-2	-14.1
O	BEEHIVE INT'L	4- 7	5 3/4	- 5/8	-9.8
A	BOLT.BERANEK & NEW	6- 14	11 5/8	- 7/8	-7.0
N	BUNKER-RAMO	10- 20	16 1/4	-2 3/8	-12.7
A	CALCOMP	3- 13	8 1/2	-2 3/8	-21.8
O	CAMBRIDGE MEMORIES	3- 9	5 7/8	- 3/4	-11.3
N	CENTRONICS DATA COMP	16- 37	30 1/2	-3 1/2	-10.2
O	COGNITRONICS	1- 4	2 1/4	0	0.0
O	COMPUTER COMMUN.	6- 12	7 3/4	-1 7/8	-19.4
O	COMPUTER CONSOLES	4- 10	7 3/4	-1	-11.4
A	COMPUTER EQUIPMENT	3- 6	5	- 3/4	-13.0
O	COMPUTER TRANSCEIVER	1- 3	3 1/4	- 1/8	-3.7
O	CONTEN	9- 38	28 3/4	-6	-17.2
N	CONRAC CORP	19- 26	19 1/4	-2 3/4	-12.5
O	DATA ACCESS SYSTEMS	3- 14	11 1/2	0	0.0
O	DATA 100	9- 20	19 1/4	0	0.0
A	DATA PRODUCTS CORP	15- 25	19 1/8	-1 3/8	-6.7
O	DATUM INC	2- 6	4	- 3/4	-15.7
O	DECISION DATA COMPUT	2- 6	3 5/8	-1	-21.6
O	DELTA DATA SYSTEMS	1- 1	1 1/4	+ 5/8	+100.0
A	DOCUMATION INC	6- 34	25 7/8	-4 1/8	-13.7
O	DATARAM CORP	6- 32	28	-3 3/4	-11.8
N	ELECTRONIC M & M	4- 9	6	-1 1/2	-20.0
O	FABRI-TEK	1- 2	1 1/2	+	+4.3
O	GENERAL COMPUTER SYS	1- 3	1 7/8	- 1/2	-21.0
N	HAZELTINE CORP	10- 17	14 1/8	-1 1/2	-9.5
N	HARRIS CORP	17- 36	31 3/4	-4	-11.1
O	INFOREX INC	6- 11	8 1/8	-1 1/4	-13.3
O	INFORMATION INTL INC.	8- 12	9 1/4	- 1/4	-2.6
O	INTEL CORP	39- 62	51	-5 1/2	-9.7
A	LUNDY ELECTRONICS	4- 8	5 3/4	-1 1/4	-17.8
O	MSI DATA CORP	12- 19	13 1/4	-1 1/8	-7.8
N	MEMOREX	27- 59	40 1/4	-10 3/4	-21.0
N	MOHAWK DATA SCI	6- 15	10 3/8	-2 1/4	-17.8
O	OMEX	2- 6	6	0	0.0
O	PENRIL CORP	5- 12	10 3/4	-2	-15.6
N	PERTEC CORP	9- 17	12 3/4	-3	-19.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 1/2	0	0.0
O	RECOGNITION EQUIP	7- 13	10	-1 1/4	-11.1
O	SCAN DATA	1- 5	2 5/8	- 1/8	-6.5
N	STORAGE TECHNOLOGY	19- 46	30 1/4	-3	-9.0
O	T BAR INC	11- 20	18	-1 3/4	-8.8
O	TALLY CORP.	4- 9	6 3/4	- 7/8	-11.4
A	TEC INC	6- 13	9 1/4	-1 3/8	-12.9
N	TEKTRONIX INC	33- 50	45 1/2	-2 3/8	-4.9
N	TELEX	3- 9	6 1/4	-1 5/8	-20.6
O	TESDATA SYSTEMS CP	13- 23	14	- 1/2	-3.4
O	WILTEK INC	1- 2	1 7/8	+ 1/4	+15.3

SUPPLIES & ACCESSORIES

EXCH		1978 RANGE (1)	CLOSE OCT 18 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	8	-1 1/4	-13.5
O	BALTIMORE BUS FORMS	2- 4	1	- 3/4	-42.8
A	BARRY WRIGHT	14- 30	25 3/8	-2 5/8	-9.3
O	CYBERMATICS INC	1- 1	7/8	- 1/8	-12.5
O	DUPLEX PRODUCTS INC	16- 30	16	-9 7/8	-38.1
N	ENNIS BUS. FORMS	8- 17	13	-1 1/2	-10.3
N	3M COMPANY	43- 66	59 3/4	-2 3/8	-3.8
O	MOORE CORP LTD	26- 34	30	-1 1/2	-4.7
N	NASHUA CORP	18- 37	27 3/4	-3	-9.7
O	STANDARD REGISTER	20- 27	24 1/2	-2 1/2	-9.2
A	TAB PRODUCTS CO	8- 16	12 1/4	-1 7/8	-13.2
N	UARCO	19- 31	28 5/8	+1 1/8	+4.0
A	WABASH MAGNETICS	10- 22	17 3/4	-2 1/8	-10.6
N	WALLACE BUS FORMS	18- 33	27	- 3/8	-1.3

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Intended as a high-end extension of IBM's small business systems line, the System/38 sports a raft of 'firsts,' including a previously unavailable operating system, compressed logic circuitry and 32K-bit memory chips.

IBM Packs System/38 With Technological 'Firsts'

By Jeffry Beeler
CW Staff

ATLANTA — IBM has combined its latest memory technology with enhanced logic circuitry and previously unavailable operating software to create a general-purpose system that reportedly provides an upward expansion path for users of the firm's System/3 and System/34 processors.

Described as an upper end addition to IBM's small business systems line, the System/38 bulges with technological "firsts," both hardware and software. These advances are said to include:

- An unbundled operating system that marks the first change IBM's General Systems Division (GSD) has made in its software architecture since 1969.
- Logic chips that package bipolar circuits 28 times more densely than in the System/3.
- The first reported use of 32K-bit memory chips, which cycle in 600 nsec
- IBM's first implementation of RPG-III.
- A virtual storage technique termed "single-level storage management."

IBM spokesmen characterized the System/38 as a "workstation-oriented" offering that supports 40 CRT terminals as a practical maximum. They also credited the System/38 with providing an improved price/performance ratio compared with the System/3, although the sources declined to specify how much of an improvement the latest system offers.

Most of the System/38's reported boost in price/performance stems from the advances in semiconductor technology or from the introduction of a licensed operating system called the Control Program Facility (CPF), which addresses six to seven times more basic instructions than the System/3. The CPF integrates functions like workstation support, data base management, security facilities, communications support and message facilities, which its GSD predecessors do not.

Like IBM's recently announced 8100 [CW, Oct. 9], the System/38 offers main storage built around 64K-bit memory chips. Unlike that previous system, however, the company's latest offering packs four of these chips onto one 256K-bit random-access memory (RAM) module occupying 1 sq in.

The system also incorporates 36K-bit RAMs comprised of 18K-bit chips and 128K-bit RAMs consisting of 32K-bit chips, the sources added

Using the 256K-bit modules and the 64K-bit chips, the System/38 report-

(Continued on Page 4)

If Employers Take Carter Cue

Many DPers May Feel Salary Pinch

By Brad Schultz
CW Staff

WASHINGTON, D.C. — Virtually all DP professionals will earn less next year than expected if U.S. employers enforce the 7% lid on annual salary increases proposed last week by President Carter to help his Administration fight inflation.

Although the plan is called voluntary, an employer who fails to comply with the 7% lid faces denial of contracts, "privileges" or other benefits, Carter stated.

Among DPers, the median salary rose 12.4% from mid-1977 to mid-1978, according to a Fox-Morris Personnel Consultants study that also showed 16% to 18% gains by programmers, an "almost 20%" increase for DP communications and auditing specialists and growth exceeding 20% for top-level DP executives over the same period [CW, July 17].

An Association for Systems Management study found the 1977 DP salary median ($24 786) 32% higher than the 1974 median ($18,749) [CW, July 3].

Who Will Feel It More?

The higher paid DP workers — programmers, systems analysts and DP managers — will be more disturbed by the 7% lid than will keypunchers and computer operators, according to Robert White, chairman of the Association of Computer Programmers and Analysts (Acpa)

But Data Processing Management Association (DPMA) president Delbert W Atwood Jr said the constraint inflicts a sharper sting in the less lucrative ranks, because more affluent DPers can better afford the prospective financial setback.

White predicted Carter will fail to win widespread public support for his voluntary anti-inflation program and has merely "delayed the inevitable: mandatory controls."

Resource shortages or other circumstances may well force manufacturers to raise prices by more than 7% in order to obtain any profit, White explained, adding that labor unions will not adhere to the 7% wage limit if prices climb at a faster rate.

Nevertheless, DP users and vendors alike should give the program a try, the Acpa chief declared

However, somewhat at odds with the Carter policy, White said that business-sector DP salaries should be pegged to corporate profitability, allowing salary hikes commensurate

(Continued on Page 4)

Processor Lets IBM 3270s Run on X.25 Packet Nets

By Ronald A. Frank
CW Staff

BURLINGTON Mass. — IBM 3270 CRT systems running under the Binary Synchronous Communications (BSC) protocol will reportedly be able to operate in X.25 packet-switched networks if they use the 9100 series Network Interface Processor introduced by Cambridge Telecommunications, Inc (CTX)

A multiple-microprocessor interface device, the 9100 allows a 3271 controller to communicate with a packet-switched network based on the X 25 standard even though the 3270 subsystem operates in BSC mode, a spokesman said

The 9100 accepts conventional BSC formatted data from the 3271 controller and converts it into a High-Level Data Link Control (HDLC) bit stream that is compatible with X.25 networks The installation of the 9100 at a remote site requires no changes in the IBM 3270 subsystem, CTX said.

When operating in an X.25 network the 9100 processor acts as a concentrator, taking BSC input and translating it into an HDLC bit stream for transmission on a packet network.

Two models of the 9100 were introduced by CTX. The 9101 handles in-

(Continued on Page 6)

MVS Insights Gained

By Don Leavitt
CW Staff

LONDON — The use of a small-batch jobstream run on a large-scale IBM 370 configuration monitored by SMF has provided some insights into the effectiveness of IBM's MVS environment, according to the consultant who supervised the experiment at BOC Datasolve, a service bureau operated under British Oxygen Corp.

Speaking to a technical session at a recent meeting of the European Computer Measurement Association (Ecoma-6), Brian Long explained that the test setup was required since the company could not modify the production environment in which SMF data was regularly collected just to determine what could be done under MVS

Instead, the Datasolve technicians developed a jobstream made up of 100 jobs — obtained by duplicating a "much smaller number" of basic job types. These were a mixture of Cobol, Assembler and Fortran compilations and link-edits together with a number of different jobs executing IBM utilities, he noted.

The hardware consisted basically of a 4M-byte IBM 370/158 multi-

(Continued on Page 6)

CW coverage on Ecoma-6 continues on Pages 6, 18 and 19.

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IBM's Christensen to Keynote

DPMA Conference Begins Today

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) International Conference and Business Exposition is set to open at the New Orleans Hilton Hotel today with 60 exhibitors displaying their wares in 100 booths.

This year's keynote speaker will be B.C. Christensen., vice-president and general manager of IBM World Trade Corp., who will talk on the international aspects of the DP business from a multinational corporation's point of view.

As a whole, the conference will examine proven solutions to DP and management problems in "real world" settings, according to a DPMA spokesman. More than 40 educational sessions will be offered, including a first-time special management panel that will outline the skills DP managers must develop to advance to corporate-level positions.

Speakers on this panel, entitled "DP Arrows Are Pointing to Management — Don't Lose Your Way," include Jerry W. Geckle, president of Peterson, Howell and Heather, Inc.; John L. Jones, vice-president of management information services, Southern Railway System; and Roy N. Linton, president and chief operating officer of the Standard Register Co.

Special Interest Seminars

Two DPMA special interest groups — one on computer output microfilm (COM) and the second on the Certificate in Data Processing (CDP) — will hold half-day seminars.

For a panel on COM, Robert Woody, U.S. Datacorp's corporate development manager, will talk on "Taking the COMplexity out of COM"; Mark Woods, marketing vice-president of Quantor Corp.'s COM Division will discuss "Alphanumeric COM Recorders"; and Larry Schieber, Information International, Inc. product specialist, will outline "Features and Capabilities of Graphic COM Recorders."

The CDP symposium will deal with the recent unified effort toward professionalism as it relates to DP management and practice. Speakers will include Beverly Madron, the CDP interest group's president; Mert Walker, vice-president of the Institute for the Certification of Computer Professionals; Gary Casper, president of the Society of Certified Data Processors; and Jim Brown, director-at-large of the Association of Computer Programmers and Analysts.

Mixed Bag

Educational sessions will cover a mixed bag of topics. For example, Robert Courtney, data security staff member at IBM in Kingston, N.Y., will present "A Rational Approach to Data Security"; Gerry Cullen, director of communications at Datapoint Corp.'s Data Processing Division, will discuss "Data Base Management in Dispersed Processing Systems"; and Tom McShane, marketing vice-president for Vadic Corp., will talk about "Telecommunications From the Terminal User's Viewpoint."

Also, the question "Do Minis Really Outperform Maxis?" will be answered by Robert R. Sumrall, Logical Computing Corp. president. Joseph T. Simone, national product manager of Decision Data Computer Corp., will tell how to go "From Data Processing Into Management — The Importance of Being 'Cost-Effective.' "

As in the past the DPMA will confer its Computer Sciences Man-of-the-Year award, this year to Irwin J. Sitkin, vice-president of corporate data processing and administrative services for Aetna Life & Casualty Co. in Hartford, Conn.

Sitkin, who manages a $63 million DP and administrative services operation, will be honored at a luncheon Nov. 1 for developing Aetna's DP installation into one of the most sophisticated in the industry, both in technology and service, DPMA said.

DPMA New Orleans '78 is expected to draw more than 3,000 attendees including preregistrants and walk-ins, the spokeswoman said. Full conference preregistration, totaling about 800 persons, is up by over 30% from last year, when 45 companies exhibited in 68 booths.

Exhibitors this year will include IBM, which is expected to show its 8100 system, Boeing Computer Services, Inc.; Texas Instruments, Inc.; Control Data Corp.; Sycor, Inc.; Quantor; Memorex Corp.; 3M Co.'s Microfilm Products Division; and Standard Register Co.

Among those firms participating for the first time will be ITT Carrier Terminal Systems, Inc., Decision Data Corp. and Data Pathing, Inc.

The DPMA is headquartered at 505 Busse Highway, Park Ridge, Ill. 60068.

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A message from John R. Bennett
President of Applied Data Research
Princeton, New Jersey

"ADR is now into DB/DC"

After a long and careful study, ADR has concluded that the critical future needs of computer users can most effectively be answered by online data base and data communications systems; by systems that are fully compatible under all of IBM's DOS, OS and VS operating systems; and by systems that can be extended to distributive processing and new IBM hardware.

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Sincerely,

John R. Bennett

John R. Bennett, President
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Computer Configuration

U.S., Europe To Debate Data Regulation

NEW YORK — A roster of key Europeans and Americans will square off here Nov. 28-30 for an exhaustive debate on "Data Regulation — European and Third World Realities."

Jan Freese and Rossiter W. Langhorne, authors of this week's In Depth (see Page 62), will continue their discussion at the conference, which is sponsored by Online Conferences, Ltd. of Uxbridge, England.

Expected to advance the American viewpoint are William Norris, Control Data Corp. president; Henry Geller, assistant secretary of the Commerce Department and head of the National Telecommunications and Information Administration, Vico Henriques, president of the Computer and Business Equipment Manufacturers Association; Earl Kendle of Eaton Corp Richard Neustadt, White House staff member, Aiden Heintz of Tymshare, Inc.; and Harry DeMaio of IBM.

Spokesmen from Austria, Brazil, Canada, France, Germany, Sweden and the UK are also on the program, along with representatives from such international groups as the Organization for Economic Cooperation and Development Council of Europe, North Atlantic Treaty Organization, Intelsat and the Intergovernmental Bureau for Informatics.

A brochure and further information on the conference are available from the Wayne Smith Co., Suite 810, 500 12th St. S.W., Washington, D.C. 20024.

Just in Case

Special to CW

SEATTLE — In an era where "onward and upward" is the computer hardware cry, the Boeing Co.'s purchase of three obsolete IBM 7094s may seem somewhat peculiar.

But there's a good reason for the purchase. The Wires Project, which tracks the wiring used on Boeing-built airplanes, still runs on the old computers.

True, a total rewrite of the Assembler-coded, sequential data processing system is well under way. But because of the magnitude of the massive sytsem — one of the four major data bases has 8,000 segments — the full conversion will take four more years.

Meanwhile, with Boeing's airplane business thriving and increasing (at least two new models are scheduled to come off the drawing boards), the company needs backup and expansion for the current system.

Emulation of the 7094 on newer generation equipment was considered and rejected. The company has progressed past its IBM 360/65s, which were capable of 7094 emulation, and an attempt to emulate the 7094 on an IBM 370/168 resulted in slower throughput than on the 7094.

The best 7094 emulator, the company decided, was the 7094 itself. So, in a diminishing market for the old computer, Boeing bought the threesome — "just in case."

Measly Raises in Store for DPers?

(Continued from Page 1)

with company profits as an employee incentive.

Wage Inflation

Wage inflation in the U.S. is discouraging domestic computer production, White said, adding a number of major vendors — such as Amdahl Corp. — are now inclined to establish foreign plants where labor is cheaper.

Wage inflation is also shaping the nature of the software marketplace, causing a growing demand for general-purpose "portable" software packages, he continued.

Such packages entail fewer man-hours of conversion effort as they are transferred from one CPU to another, which means lower DP labor costs for the user organization, he explained.

White and Atwood agreed there is little chance many federal DP jobs will be lost as the Carter Administration tries to improve government productivity, minimize waste and cut the enormous federal budget deficit. Carter has indicated that some government workers will be laid off and certain operations curtailed as a result.

White and Atwood also agreed that "Proposition 13 effects" will not result in DP budget slashes as top-level state and local government administrators grapple with the shrinking revenues imposed by tax cuts.

Public-sector DPers will not experience "great surprises" such as massive layoffs or project cancellations, they agreed. White added that recent civil service reform legislation provides "a more justified" evaluation of professional performance in government.

Whether or not the Carter plan succeeds, inflation may eventually price the highest paid DP professionals "out of the market" and provoke intensified recruitment and training of lower paid entry-level programmers, White concluded.

Price Limits No Problem

WASHINGTON, D.C. — Plummeting hardware costs allow computer vendors to easily hold prices within the limits of President Carter's voluntary wage/price controls program, according to a spokesman for the Computer and Business Equipment Manufacturers Association (Cbema).

The Carter plan announced last week asks U.S. business to limit price increases over the next year to .5% "below their annual rate of price increase during 1976-77."

A number of vendors indicated they would "toe the Carter line" weeks in advance of the President's anti-inflation proposal, the Cbema spokesman said.

Last month, Control Data Corp., IBM, Honeywell, Inc. and Hewlett-Packard Co. advised the Carter Administration they would comply with a White House call for voluntary price controls similar to the plan now before the nation.

IBM Packs System/38 With 'Firsts'

(Continued from Page 1)

edly fits a 256K-byte memory board, storing the equivalent of 40,000 eight-letter words, in a 4.5- by 7-in. space. The System/3, by contrast, uses 8K-bit technology and thus offers only one-eighth the packaging density of IBM s latest system.

Among its other large-scale integration features, the System/38 provides bipular logic devices that hold up to 704 transistor-transistor logic (TTL) circuits — each with a 3 to 5 nsec nominal operating speed — on one 4.6 sq mm chip. Each System/3 logic chip, on the other hand, incorporates no more than 25 circuits, which operate at 8 to 12 nsec.

Because of the compression of the System/38's logic circuitry, the system's CPU mounts on one 10- by 15-in. planar board, the sources noted.

Data Base Management

The CPF, meanwhile, further contributes to the System/38's improved price/performance through its data base management facilities, workstation support, control language, single-level storage management, RPG-III and other features.

Using the data base management facility, multiple users can concurrently access centrally stored information in various formats and sequences, the spokesmen noted. While one user retrieves inventory records by stock number, for example, another user can access the same files by supplier number.

Single-level storage management, meanwhile, in effect unites main memory and auxiliary disk memory in one virtually addressable storage space, the spokesmen said. The technique frees users from storage management considerations like partitions, program overlays and file labels.

Independent Formatting

With RPG-III, an RPG-II extension that simplifies coding for workstation I/O, users can define CRT screen formats independently of a program and then retrieve those formats with one command.

Like RPG-III, the operating system's workstation support feature also lets users define screen formats independently of a program. It then permits users to code conditioning indicators, validity checking and command keys into a CPF-supported device file, the spokesmen said.

The control language — the System/38 equivalent of the System/3's Operator Control Language (OCL) — provides conditional branching and is used to request system functions. With this software feature, users can compile System/38 commands into programs that in turn can be called by RPG-III or control language programs.

SNA/SDLC Support

Among its other software features, the System/38 supports System Network Architecture/ Synchronous Data Link Control (SNA/SDLC) communications with IMS/VS or CICS/VS running on either the Series 30 processors or the 370/135 through 168 mainframes.

The system also offers System/3-to-System/38 batch conversion utilities plus conversion utilities for users of System/3's communications control program.

The System/38 comes in two versions — the Model 3 and Model 5 — both of which consist of an IBM 5381 system unit with a CPU, main memory, disk storage, console keyboard and CRT, diskette magazine unit and workstation controller.

The Model 3, however, stores a minimum of 512K bytes expandable to 768K or 1M byte, while Model 5 holds a minimum of 1.25M bytes expandable to 1.5M bytes. The Model 3 also incorporates the 64K-bit memory chips, which cycle in 1,100 nsec, while the Model 5 uses the 32K-bit devices, the spokesmen explained.

Both versions, however, provide the same set of 200 basic instructions which incorporate many supervisory, security and data base management functions.

They also support one to six 64.5M-byte nonremovable disk units for a total mass storage capacity of 387.1M bytes; a choice of Model 5251, 5252 or 5256 CRT terminals; and up to two printers — either the 300 line/min Model 5211 or the 650 line/min Model 3262, which was introduced as part of the System/38 announcement.

Hardware options available with the system include the 3410 and 3411 tape subsystems and 5424 multifunction card unit.

Typical System/38 users will include manufacturers, distributors and other businesses whose annual revenues range from $5 million to $100 million, IBM predicted.

Configurations, Prices

A small System/38 Model 3 with a 512K-byte CPU, 129M-byte disk unit, diskette magazine system, optional audible alarm, five 5251 workstations and one 5256 workstation printer costs $115,345 and leases for $3,444/mo, including software, under a three-year lease.

A "very large" Model 5 configuration consisting of a 1.5M-byte CPU, six 64.5M-byte disk systems, two 3262 printers, diskette magazine unit, audible alarm, one 3410 tape unit, three 3411 tape units, 32 Model 5251 workstations, eight 5256 workstations and 60 remote workstations linked to two SDLC communications lines sells for $760,995 and leases for $20,960/mo, including software, under a three-year lease.

Software Prices

CPF, RPG-III and the System/38 interactive data base utilities lease separately for $400/mo, $60/mo and $30/mo, respectively.

Shipments of the Model 3 and its associated software will start in August 1979, while first deliveries of Model 5 hardware are slated for February 1980.

Financial Privacy Act Seen Major Victory by Carter

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Carter Administration proclaimed a major victory for personal privacy with the recent passage of legislation that limits government access to personal financial records.

The Right to Financial Privacy Act, passed on the last day of the 95th Congress [CW, Oct. 23], requires government agencies to notify an individual when they seek his records from a bank or other financial institution and to advise him of legal steps he can take to try to stop disclosure of those records.

The bill, a response to the 1976 Supreme Court decision in U.S. vs. Miller regarding the privacy of bank records, was the product of a joint effort by the legislative and executive branches of the government, one member of the Carter Administration said. Its passage was "the biggest thing in privacy since [ex-] Sen. [Sam J.] Ervin's Privacy Act" — the Privacy Act of 1974, according to Arthur Bushkin, director of information policy programs in the National Telecommunications and Information Administration (NTIA).

Presidential Initiative

Congressional approval of the legislation marks the "first phase of the President's privacy initiative," Bushkin said. The President's privacy initiative was prompted by the work of the Privacy Protection Study Commission.

"The President instructed his Cabinet to develop a response to the Privacy Commission report," Bushkin explained. He is director of the initiative and was also a member of the Privacy Commission.

Two major recommendations resulted from the commission's work — that a "duty of nondisclosure" be placed on recordkeepers and that government access to personal records be limited.

The Financial Privacy Act addresses the latter recommendation, Bushkin pointed out. The logical next legislative step, he said, is to extend the privacy concepts to other types of records, such as medical and credit records.

However, the Administration has not decided on action in these additional areas, he said, noting the act also does not prohibit a financial institution from disclosing personal financial information to the private sector.

In any case, "in terms of the information policy of the U.S. and in terms of privacy protection for individuals, this is an enormous, enormous step forward," Bushkin maintained.

"Placing the concept in statute that the government can't have unrestricted access to records" is in line with the philosophy embodied in the Bill of Rights, he said.

This is "a victory," and victories in the areas of civil rights and individual rights to privacy are "not all that frequent," Bushkin said.

Bushkin praised the members of Congress who developed the legislation and showed a willingness to compromise when alternative language for the bill was suggested by several different executive agencies.

The Justice Department, in particular, had reservations about the legislation as originally drafted [CW, Aug. 25], but the NTIA was able to come up with a draft acceptable to both the legislative and executive branches.

Although the Justice Department was concerned about restricting law enforcement agencies' access to financial records, it "actually supported this legislation," which, Bushkin said, is "in sharp contrast to Justice Departments of previous administrations."

Even though the bill's provisions place an "administrative burden" on the government, the Administration believes the burden is acceptable considering the importance of individual privacy, he explained.

Trial Date Set for Ristol

LOS ANGELES — Arne Ristol, the 52-year-old self-employed bookkeeper accused of stealing nearly $1 million from a California bank, will face trial in federal district court here Nov. 27.

Ristol pleaded innocent to charges of grand theft earlier this month in connection with the disappearance of $927,288 deposited into his United California Bank account as the result of a keypunching error [CW, Oct. 2]. He is scheduled to appear before the court on Nov. 17 for a pretrial hearing.

Officials recently freed Ristol on bail when the federal district court reduced it from $100,000 to $75,000 at a bail hearing in mid-October. Ristol's attorney, Eugene Andres, had been petitioning the court for a reduction since his client's surrender in September.

To date, approximately $300,000 of the $927,288 has been located and nearly $50,000 has been recovered by the bank.

Although authorities initially believed Ristol had fled with the money to Florida, it was discovered upon his surrender that he had actually gone to Europe. Investigators suspect the stolen money was "laundered" by Ristol through a complicated series of deposits and withdrawals between American, Canadian and European banks.

Authorities also believe a number of accomplices were involved in Ristol's alleged activities.

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'Not Elegant, But It Works'

Simple Process Helps Airline Predict DP Needs

By Don Leavitt
CW Staff

LONDON – "It's not very elegant, it's not sophisticated, but for us it works so you're welcome to the ideas as long as you are willing to adapt them to your own situation."

That was the way systems programmer Bill Miller of American Airlines described how his installation "at least takes a stab" at predicting what computer resources it will need in the future.

Miller told a session of the sixth meeting of the European Computer Measurement Association (Ecoma-6), held here recently, that the process starts simply enough with a set of forms the development team is required to submit whenever a major project reaches the design phase. The forms force the designers to provide their best estimates of how the project will impact the center.

Starting with basics such as the implementation date, the forms also seek information, in terms of SMF data, on detailed computer resource requirements for each job step.

While there was some resistance to completing these forms when they were first mandated, Miller said the center's conscientious post implementation feedback has improved forecasting of later projects and made the designers far more cooperative.

In any case, he told the session, the information is summarized and posted to a SPF partitioned data set. A printout of the data, produced using the Easytrieve report writer package from Pansophic Systems, Inc. – "the quickest and easiest of the 'quick' and dirty' approaches I know" – lists projects in sequence by implementation quarter.

That base report shows the estimated number of runs per month and the resource demands per run. The CPU minutes listed are generally provided by the designers and based on resources used by existing programs they feel are similar to the projected ones.

The second report converts the CPU minutes into decimal parts of IBM 370/168-3 for each new run, then totals the new load per quarter so that all concerned can see the cumulative effect of the incoming projects.

CW at Ecoma-6

The projections go three years into the future so if management or any one else sees a CPU increase that seems out of line, they can see the reason for it.

The use of a 168-3 as a base doesn't mean American is committed to getting that equipment, Miller emphasized. In fact, the airline has a 168 Attached Processor complex and an Amdahl Corp. 470V/6, but the 168-3 comparison provides a fixed point of reference, Miller said.

The projections of shared Direct Access Storage Device (DASD) and tape capcity required are a combination of data provided by the designers and some trend analysis work Miller and his crew have done.

The DASD load projections are based on experience which showed Miller that, at American, each 1% of CPU requires 60M bytes of disk space. That figure won't hold for every center, but there probably is a figure that does apply to a given center, he told his audience.

The tape drive projections are tied to American's anticipated growth in noninteractive applications, utilizing another figure culled from the airline's own experience "that probably isn't any good to anyone else in this whole room," Miller cautioned.

At the close of his representation, he reemphasized that his reports are only the first step in equipment planning at American. Miller's figures are given to the hardware analysts who reviewed them in the light of their own experience and knowledge of current or announced equipment.

The hardware analysts, in turn, pass their thoughts along to upper management, which adds its own special insight to the problem before making final decisions, Miller said.

Experiment Gives Insight Into MVS

(Continued from Page 1)

processor with six strings of IBM 3330 disks accessed through two 3830 controllers and two ISC paths, giving four separate data paths in all, he continued.

Twenty-One Jobstream Runs

Twenty-one separate runs of the jobstream were executed and data was collected using SMF and MF/1. The first eight runs – four uniprocessor (UP) and four multiprocessor (MP) – utilized 20 initiators and were run with differing amounts of main storage.

Seven more runs were executed in the MP environment with 4M bytes of main storage but with initiator loads ranging from one to 30. One immediate result of this series of tests was to show a maximum throughput rate was obtained at about 10 initiators but, the consultant noted, that breakpoint might have been caused by the limited disk space available.

The remaining six runs were also carried out in the MP mode with varied numbers of initiators and differing amounts of main storage, Long said.

Figures Vary

Summing up, he noted that although the useful work required from the system was a constant – the test jobstream – the total work needed to process the jobs through each environment was different. The system CPU time varied from 1155- to 592 sec, while the user CPU time ranged only from 620- to 564 sec.

Another figure that varied considerably was the basic amount of page I/O required, he pointed out. In particular, the page I/O increases both with reduced main storage and with an increased initiator load, "but neither of those results was a surprise."

The biggest changes occur in system CPU time, with an increase of 180 sec on a 373-sec base in moving from a UP to an MP setting, at zero page I/O, and an increase of 6.8 sec/1,000 page I/OS.

In the case of user CPU time, he went on, there was an increase of 40 sec on 534 in moving from UP to MP and an increase of only .68 sec/page I/OS/.

Long said the data reported referred to runs under MVS Release 2.0 but that the same jobstream was run later against MVS release 3.7 "and the same general picture emerged." There is, he noted, a linear relationship between CPU time and page I/O and an overhead associated with the MP environment.

Of course, he added, all the time values including user CPU time have been reduced under Release 3.7.

IBM 3270s Gain X.25 Link

(Continued from Page 1)

put from three BSC terminals, outputting one X.25-compatible data stream at speeds up to 9,600 bit/sec. The 9102 can handle eight BSC terminals, outputting up to four X.25 data streams at speeds up to 56k bit/sec.

Depending on user requirements, the 9100 can be programmed so 3270 terminals can access multiple applications in multiple hosts, similar to IBM's Advanced Communications Function (ACF), a CTX spokesman said.

The 9100 is used in conjunction with the Data Modified Emulator Program (DMEP), a software package introduced by CTX last year. The DMEP resides in an IBM 370X front end and allows IBM CPUs to be interfaced to X.25 networks without conversion to the Virtual Telecommunications Access Method (Vtam) or the Network Control Program (NCP).

The DMEP also contains a Network Operator Control Program (NOCP) that lets the user run remote diagnostics on the 9100 processor from the host CPU site.

Each group of four communications lines within the 9100 is defined as a Communication Line Processor (CLP) having its own dedicated microprocessor, program memory and dual-port data memoty. The CLP controls both X.25 network access lines and user terminal lines, CTX said.

The CLP's dedicated 400 nsec, 8-bit microprocessor contains 16K to 64K bytes of memory as required by the user's network configuration. The CLP memory is divided into program and data space; each memory segment is a separate, isolated dual-port system. Thus the processor always has access to its program space without the contention that exists in the data space, CTX said.

The Network Protocol Processor (NPP) contains a microprocessor that provides the hierarchical management for the distributed micros as well as the implementation of the various user-level X-25 software. The NPP has its own dedicated program memory and controls the common I/O memory bus.

The 9100's data space is shared by the CLP and the NPP and is used for the storage of data as it is passed between the terminals and the network.

The 9101 costs $7,600 while the 9102 is priced at $18,500. First deliveries of the processor are scheduled for the first quarter of 1979. The DMEP software – required with the 9100 – costs $500 for installation in a 370X front end.

CTX is at 5 Old Concord Road, Burlington, Mass. 01803.

IBM Witness Defends Firm's 'Dirty Pooling'

By Connie Winkler
CW Staff

NEW YORK — When IBM acquired Science Research Associates (SRA) in 1964, it used the same accounting methods for which an IBM expert witness in the U.S. vs. IBM case faulted Memorex Corp. and Telex Corp.

However, Abraham J. Briloff, professor of accountancy at the City University of New York's Baruch College, claimed the SRA incident was not as bad because of IBM's total financial picture and accounting practices at the time.

Through the practice — called "dirty pooling" by Briloff — IBM was able to "suppress" $63 million. He earlier criticized Memorex for "suppressing" $16 million [CW, Oct. 16].

"Dirty pooling" is a term Briloff coined to describe the recording of the acquisition of a subsidiary on the parent company's books at an amount less than the market value of the stock traded for the subsidiary.

In this way the parent company "suppresses" the true value of the acquisition, with the amount "suppressed" being the difference between market value of the stock traded for the subsidiary and the amount recorded for that stock. The practice makes the parent company look more profitable.

No Ready Answer

For IBM in 1963, there was no clear answer for how the $63 million should be accounted, Briloff said. To properly show the relation of revenue to expenses, Briloff recommended amortizing the $63 million over 10 years, adding only a $6.3 million write-off each year.

Given IBM's total revenue, this would amount to only a 1% annual impact, Briloff said.

"Had I seen the SRA situation in 1964 and my antenna was alert, this is not an example of dirty pooling I would have singled out for commentary because of the diminimus ramifications," Briloff said. Under questioning by judge David N. Edelstein, Briloff said the Memorex and Telex cases were worse — dirtier or dirtiest — pooling because earnings were being inflated "addictively" and expenses were also being deferred.

"When I see front-end loading of revenue and rear-end loading of expenses, all of that comes together as the dirtiest pooling and I am moved to write," said Briloff, who has done several articles on the subject.

Throughout his seven days on the stand, Briloff blasted the leasing companies for what he called 12-year straight line depreciation of computer equipment in the late 1960s and early 1970s. Briloff said such depreciation of a high-technology product by a leasing company was "absurd."

He contended the leasing companies had difficuties because of their accounting practices and not because, as the government suggested, of IBM's changes in products, pricing or maintenance practices.

McAdam's Ratios Discounted

Briloff also pooh-poohed as nonsensical various ratios of cash flow to stockholders' equity. These ratios were presented by government witness Dr. Alan K. McAdams more than a year ago. McAdams, a Cornell University economist who was on the stand for more than 70 days, was in the court room again for two days of Briloff's cross-examination.

In long and sometimes contorted replies, Briloff discounted all the ratios which McAdams had used to show IBM profits were underestimated. The ratios, based on cash flow accounting techniques, have no useful purpose, are misleading and since 1972 have been prohibited by the Securities and Exchange Commission, Briloff said.

McAdams used the ratios as a method of comparing various manufacturers of general-purpose computers. Nonoperating income was deducted in each of the calculations so the firms could be compared on strictly an operational basis. This eliminated the income IBM received from its security transactions and made the IBM return look bigger.

Government lawyer Alan Nisselson tried to draw out of Briloff — who strongly believes revenues should match expenses in all accounting — that IBM front-loads expenses by writing them off in the years they occur, particularly research and development expenses and marketing expenses.

If it could be clearly demonstrated that an R&D project produced revenue over a period of years, then that R&D expenditure should be considered as a capital expense over several years, Briloff said, in opposition to the Financial Accounting Standards Board's position. He would not agree, however, that marketing expenses should be spread out over a period of years.

During the cross-examination, Briloff also criticized public auditing firms which also do managerial and/or tax advocacy for the firms they audit. Briloff said he voiced this concern — that Price Waterhouse & Co. does IBM's auditing and also provides litigation support — to IBM. IBM counsel Joe Sahid objected, however, that the litigation support was for IBM's law firm, Cravath, Swaine & Moore.

That was just one of Sahid's objections, which became more frequent as the cross-examination continued and which in most cases were denied by Edelstein. Conflicts between Sahid and Edelstein were frequent.

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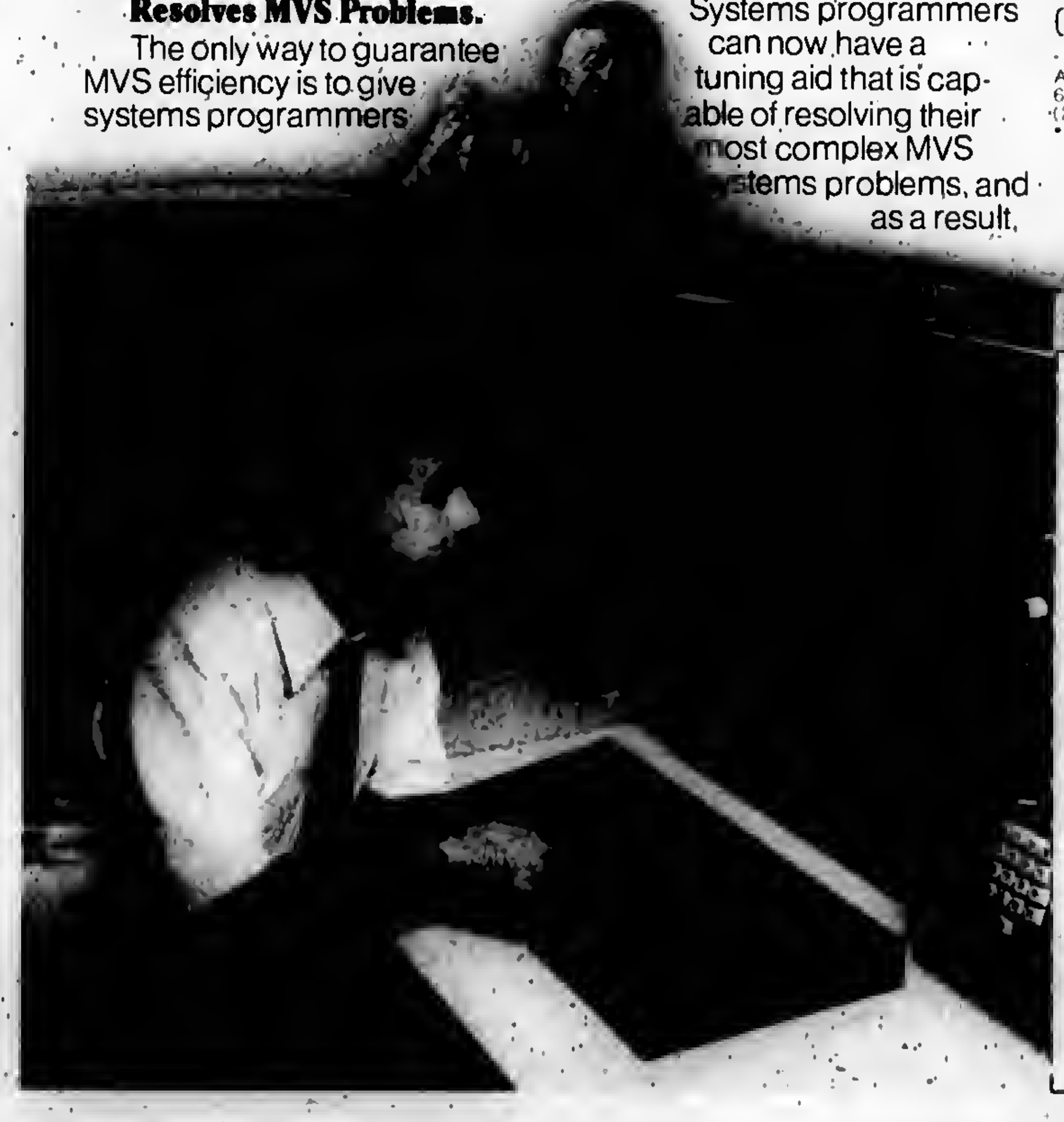

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To Monitor Federal Contractors

MIS at Labor to Track Firms' EEO Compliance

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — As a result of the President's federal reorganization efforts, the government is turning to increased automation to streamline its Equal Employment Opportunity (EEO) programs.

Reorganization of these programs was announced by President Carter last February. Since then, the Office of Federal Contract Compliance Programs (OFCCP), in the Labor Department's Employment Standards Administration, has assumed total responsibility for all federal contract compliance activity.

OFCCP, which became operational early this month, is currently developing plans for a large management information system (MIS) that will track federal contractor compliance with the various EEO laws, the Labor Department said.

The contract compliance effort, once scattered among 11 federal agencies, did not have a "comprehensive or coherent data system . . . because it was so fragmented," according to David E. Wilkinson, chief, Branch of DP Programs, OFCCP.

The OFCCP MIS will compile statistical information on EEO and Affirmative Action programs among federal contractors and enable the government "to target specific contractors for review," Wilkinson said.

Some 30,000 Contractors

Some 30,000 prime contractors and thousands more subcontractors, including most major corporations in the country, are covered by federal laws prohibiting employment discrimination on the basis of race, sex, color, religion, national origin, handicap or veterans status, according to Labor Department figures.

Affirmative Action is also an integral part of the requirements of these contractors.

The OFCCP MIS is expected to be operational in about 30 months, according to Wilkinson, who is overseeing the system's development. In the meantime, he said, OFCCP is using or developing three interim systems.

One system, the Automated Contractor Employment Compliance System, has been operational for several years in the Department of Defense, which now runs the system for OFCCP, he said.

That system monitors contractor compliance with the various EEO and Affirmative Action requirements of the federal government.

Correspondence Control System

Second, Wilkinson said, OFCCP has just implemented a Correspondence Control System (CCS) developed by Optimum Systems, Inc. (OSI) of Rockville, MD.

CCS monitors and tracks incoming correspondence and other items "such as show cause orders, sanction actions and consent decrees," according to the system's Labor Department description.

CCS is a remote-batch system with limited on-line query capability, Wilkinson said. OSI operates the system through a General Services Administration Teleprocessing Services Program (TSP) contract, he added.

The third system, recently developed for OFCCP by Information Planning Associates, Inc. (IPA), a Gaithersburg, Md., minority-owned firm, is called the Complaint Administration System (CAS).

According to its OFCCP description, CAS is designed to "monitor progress in processing complaints and current status of all outstanding complaints in order to produce various output reports to meet management needs and to satisfy requirements for court-ordered reporting."

The system will be implemented in the first quarter of next year, Wilkinson said. It might be merged with the correspondence system and run by OSI, or IPA or the National Institutes of Health Computer Center might be chosen to operate it on a contract basis, he said.

MIS Takeover

Eventually, the three systems will be discontinued and their functions taken over by the comprehensive OFCCP MIS, according to Wilkinson. Peat, Marwick, Mitchell & Co. is currently developing a detailed system design under an OFCCP contract.

The system design study should be completed by next March, Wilkinson said. That study will be the basis for a contract OFCCP will award for the final system.

The final systems, which will be "very large" and "very complex," according to Wilkinson, will provide "universal and comprehensive coverage of all data relative to compliance programs operations, contractor universe, contractor performance, federal procurement action, enforcement/litigation data, complaints and all aspects of the execution of [relevant federal laws], according to an OFCCP statement of purpose.

Wilkinson said the OFCCP MIS will not be operated in-house initially. The Labor Department, he explained, is currently upgrading its DP facilities.

The department will include the OFCCP requirements in its upgrade planning, and eventually the OFCCP MIS will be operated in-house, he said. Until that ability is established, several years from now, the system will be operated by an outside contractor on a competitive basis," according to Wilkinson.

Coming System Seen Boon To EEO Data Collection

WASHINGTON, D.C. — Lack of adequate, accurate data has been a major stumbling block in the government's efforts to enforce Equal Employment Opportunity (EEO) and Affirmative Action laws, according to David E. Wilkinson of the Labor Department's Office of Federal Contract Compliance Programs (OFCCP).

The management information system OFCCP is developing will go a long way toward remedying the problem, he said.

Along with the automated system, OFCCP is in the process of establishing 60 field offices that will be connected on-line to the OFCCP MIS, he said. These offices will provide statistical data and conduct on-site reviews of federal contractors to determine compliance with EEO laws.

The system will help OFCCP target contractors for review, he explained, noting that because the Labor Department has the manpower to review only about 5% of government contractors a year, there is a need to better identify potential violators of federal law.

Efforts Maximized

There is no point in checking up on or "harassing" the contractor who is in compliance with EEO laws, he said, and as data is made available through the system over a period of time, the MIS will allow OFCCP to "maximize our efforts."

He stated that OFCCP administrators are "very serious about this program." The EEO program has really not worked very well, he said, because it was too fragmented and did not have access to accurate data.

"The universe of contractors is very large: the universe of contracting is even larger," Wilkinson said, adding that no one in the government even knows how may government contractors there are.

OMB System

The Office of Management and Budget is developing an automated system to track government contracting activities, he said, adding that the system will be operational some time next year.

As an indication of the acute lack of data in this area, Wilkinson said one company OFCCP had considered for one of its systems development contracts had already been found by the government to be in noncompliance with EEO laws. The company paid higher salaries to men than to women doing comparable work, he said.

Consolidation of the federal contract compliance programs and development of the OFCCP MIS are indications the Carter Administration is trying to get a program together that can be competently and effectively administered, Wilkinson said.

"Now we have a chance, with it being consolidated, to actually make it work," he said.

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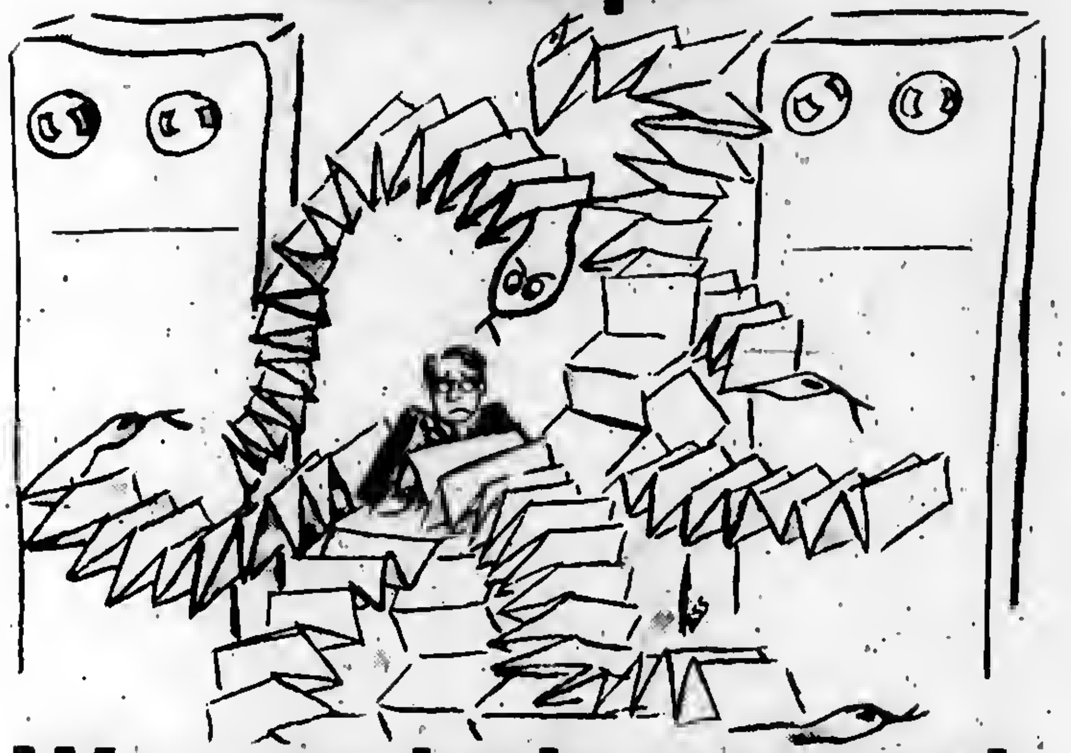

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Physical Handicaps No Obstacle to DPers

By Howard A. Karten
CW Staff

ATLANTA — Programmers who are physically handicapped can achieve the same level of effectiveness as nonhandicapped programmers, according to Nancy A. Flood of Virginia's Department of Vocational Rehabilitation.

Speaking at a session entitled "Rehabilitation of the Handicapped as Productive Programmers" at the Americas Univac Users Association (AUUA) meeting here last week, Flood said it is important for companies to realize that successful employment of handicapped programmers and analysts is possible with only minor adjustments.

CW at AUUA

According to Flood, one of her key problems is getting potential employers "not to look at her as if she were crazy" when she visits them and suggests hiring the handicapped people she has trained in the field.

Explaining that those she trained are neither supermen nor sinners, Flood suggested "they [should] have the same right to fail or do dumb things as anyone else. They're really just like normal human beings" except for their physical handicap, which is really a minor factor in their working abilities.

Emphasizing this point, Flood recounted how two of her students working as a team won a rifle contest in a recreation program. "One was a C-2 quadriplegic (paralyzed from the neck down) and the other was blind. They figured between them they had the same abilities as a nonhandicapped person; the blind one aimed the weapon with instructions from the sighted one and then pulled the trigger," she explained.

Training Project

Flood runs the computer programmer training project for the Woodrow Wilson Rehabilitation Center of Virginia in Fishersville, which she described as the first comprehensive rehabilitation program in the country. Three factors combined to draw her into this program, she explained.

First of all, she had been working as a systems analyst and wanted to do less travelling. Second, an operation that confined her to a wheelchair for several months gave her some insight into the problems faced by the handicapped.

Finally, when an IBM employee became handicapped, the Commonwealth of Virginia and IBM started a program to train the handicapped. These factors coalesced and led her to her present position, where she has been for the past six years.

Describing her success rate in placing her program's graduates as "in excess of 95%," Flood said that larger DP shops and banks seemed the most receptive to the idea of employing handicapped people. "Larger shops don't seem to have as many problems or crises as smaller ones, and banks employ them for two reasons: it's good public relations and banks tend to be large users of DP equipment," she explained.

No Additional Expenses

Employers usually don't incur additional expenses in employing the handicapped in Virginia because the Commonwelth absorbs the cost of the extra equipment needed by the handicapped, Flood commented.

For example, the Commonwealth would pay for the cost of a typewriter only if the item were not in standard use there. If a typewriter is standard equipment, the state will pay for the cost of any necessary modifications to the typewriter — such as a motor-driven reverse indexing feature — but not for the typewriter itself, she explained.

Citing the cases of some students who had "attitude problems" that interfered with their adjustment to a work environment, Flood asked that the graduates of her 12-month program not be regarded as superwomen or supermen.

Despite this, she added, they do have some abilities that the nonhandicapped person may lack. "They could just sit at home and [legally] collect Social Security, but they're motivated enough to want to work. They have often had to rely heavily on logic to make their lives easier, which prepares them for work in DP."

Although a few of her trainees are so severely handicapped that they cannot go into an office, most try and are successful at working in an office environment.

Noting that problems that arise when employing handicapped workers can usually be solved, Flood mentioned one of her trainees who hired as a personal attendant someone who worked in the same company. The two commuted to and from work together and also roomed together.

Flood's program runs for 12 months, with the last six weeks devoted to producing a live system.

Study Coordinator Outlines Troubles

Government Seen Unprepared for DP Future

By Howard A. Karten
CW Staff

ATLANTA – The federal government is generally mismanaging its information technology resources and has not developed a plan for exploiting the technological opportunities of the future.

That was one of the observations made by A. P. Jensen of the Georgia Institute of Technology at the Americas Univac Users Association (AUUA) meeting here last week. A coordinator of the President's DP reorganization project, Jensen addressed a session on federal reorganization, policies and regulations.

He claimed that mismanagement exists despite the fact that the federal government is "irreversibly and increasingly committed to the use of information technology to manage its resources, provide its services and protect its citizens."

Jensen, who was previously involved in a similar reorganization effort for Carter when he was governor of Georgia, maintained that despite organizational problems, government DP workers are "intent on doing the right thing in the right way" and are unfairly maligned.

Summarizing his findings for the seemingly unsurprised audience, Jensen said the present condition of the government with respect to DP activities and policies will not improve without a major change in attitude towards information technology. "A systematic and integrated effort will be required to bring about needed change," he added.

Jensen said his group used the term "information technology" to mean the "confluence of computers and communications."

One thing the government must do to straighten out its organizational woes is establish "clear and measurable criteria by which mission performance can be judged and then reward competence in order to build and strengthen it," he said.

This strengthening of competence is the major challenge government faces, Jensen continued.

In order to achieve these goals, an initial increase in budgets will be required, but ultimately the "momentum" established will allow government to save money, Jensen claimed.

Jensen outlined his group's recommendations as follows:

- The government should take action to establish the importance of information technology, provide tools for its management and serve national goals.
- The government should expand the use of DP technology to achieve its goals and reduce the cost of government services.
- The OMB should establish policies requiring that DP costs be charged back to the agencies and programs incurring those costs.
- All DP equipment that has outlived its useful cost-effective life should be phased out.
- The government should significantly improve the process of acquiring DP equipment and services by placing more emphasis on planning, needs definition and cost justification.

"Now, if a high-technology agency wants to procure a $50 million piece of instrumentation, it can do so with less effort than it takes to acquire a $5 million computer which would be an integral part of the use and productivity of that body of instrumentation," Jensen noted.

CW at AUUA

- The government must upgrade the training and career development required for functional managers, reclassify personnel skilled in the management and use of information technology and establish career paths for such persons.
- Program and mission agencies must strengthen managerial and technical expertise in information technology.
- The government must institute a program in information technology to meet the needs of the nondefense sector.
- The government should revitalize efforts to establish and maintain a standards program for information technology in order to support the economical purchase and operation of equipment.

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Will Systems Chiefs Be Presidents Some Day?

By Brad Schultz
CW Staff

CHICAGO — Are the information systems managers of today the corporate presidents of tomorrow?

Maybe so, a large company's executive vice-president told a session on "New Opportunities for the DP Manager" at the Information Management Exposition & Conference here recently. But it is also becoming more difficult to manage information systems well, which may mean it will be more difficult for most data chiefs to enter the corporate ranks, he noted.

Systems managers are already participating in corporate strategy planning, Kraft, Inc.'s William E. Reidy said. In the current fifth age of systems management, the chiefs primarily supervise company resources in the sense that a controller supervises the firm's money.

Accordingly, the systems manager must understand why and how his firm exists, including the changing nature of the industry it serves and the interpersonal relationships of its other managers, Reidy said. Therefore, he must possess strengths beyond mere technical expertise to survive — strengths supposedly honed to perfection in a good chief executive.

Through the Ages

During the first age of systems management, prior to the advent of general-purpose digital computer systems, the systems manager was really a clerical supervisor in change of tabulating equipment. His background was essentially in accounting and he had some machine experience, Reidy explained.

The early CPUs introduced the second age, which entailed a much greater company investment in systems equipment than in personnel. Perhaps one programmer was placed under the systems chief, who was now more solidly into electronics.

The third age systems chief, typically in charge of IBM 1401 and 7000 series CPUs, was a "paper pusher" who reported to the company controller and was for the first time invited to participate in financial decision making, Reidy continued.

The third age chief encountered problems that other manager types had experienced earlier in their careers, such as rapid personnel turnover.

IBM's 360 series mainframes ushered in the fourth age during the mid-1960s, broadening the size of systems staffs and extending the scopes of their involvement in company matters. The fourth-generation systems chief handled multiple shift operations and was organizationally seen as a director — with managers reporting to him, Reidy said.

The fourth generation chief became involved in corporate-level politics, especially as "a cloud developed over many installations because of unfulfilled DP promises, Reidy asserted.

The fourth generation systems manager could not benefit from professional training programs addressed to the true nature of his responsibilities and begin to correspond with other systems managers in a spirit of professional affiliation, he added.

But the fifth age manager does have access to professional training programs and formal societies of his peers. The top systems chiefs of this current age handle communications and DP resources for their firms, often at the vide-president level.

The next step in promotion for current systems vice-presidents was identified as the senior or executive vice-president in charge of operations or technical services. At this stage, they are at the president's "right hand."

Reidy seemed to draw a distinction between DP and systems management, indicating the latter is one category of business administration while the former is more restricted to technology.

Managers Told

Graphics Systems Worth Initial Pains

By Tim Scannell
CW Staff

CHICAGO — Now that managers and corporate executives have successfully increased their ability to bombard one another with reams of information, the greatest difficulty lies in making sense out of the information fallout, according to Bruce Rodgers, market development manager for Tektronix, Inc.

Rodgers was one of three panelists at the recent Information Management Exposition and Conference (Info'78) here who discussed the techniques and problems associated with interactive graphics systems.

Most business managers must undergo a trial by fire and cross over a "pain threshold" before achieving the final reward of an operable interactive graphics system, Rodgers explained. In order to come out ahead, they must be willing and able to take the time to learn to use the computer.

A universal problem with any DP system, and particularly a graphics system, is that I/O devices or peripherals are basically "unfriendly." Compatibility and transfer gliches are common with new systems, Rodgers said, and up until now hardware vendors never went out of their way to make products "easier to use."

Graphics representations, he continued, are also terribly unexciting to the untrained eye of the average user. However, the world of bar charts and pie graphs, when fully understood, can be "incredibly informing."

Necessary Fixtures

There are several economical as well as fundamental reasons why graphics displays should be necessary fixtures in the corporate household. One of these reasons, according to Mabel Hoffman, a unit manager with Chicago's First National Bank, is to avoid "management redundancy."

Hoffman, also a member of the panel, detailed the considerations and step-by-step procedures her employer took in implementing an interactive graphics systems. Labeled the Executive Information System (EIS), the First National Bank's financial analysis package was designed as a general utility that could be used in several "number-manipulating" applications.

The system not only provided management with information, but supplied a means of distinguishing between everyday data and time-sensitive information, Hoffman stated.

The bank's six-person, full-time staff assigned to the graphics project first had to identify exactly what kind of data was used by the management departments and where it originated — internal, external or private files. Next, the graphics team had to examine management's "analytical process" or detail just how decisions were made within the corporate sanctuary.

The team discovered that management was more interested in the direction and effects of decisions than in decisions themselves, Hoffman continued. Trends, changes and financial comparisons, as well as the frequency of changes of the data, were given the most consideration in the development of the final system.

Management and employees, considered the presence of a time series data base, a built-in analytical capability and a color graphics feature necessary to aid in the financial comparisons. A menu selection type of system controlled by a light pen and requiring no previous user knowledge or command of programming language was also chosen.

Multipurpose System

The end result of "more than a couple of years" of development was the bank's management-oriented DP facility, a multipurpose system that is currently marketed by IBM (a codeveloper) as the Trend Analysis/370 package.

To date, the system has been used by the First National Bank for retail market share analysis, automatic teller usage, interest rate tracking, credit and loan analysis, credit card billing analysis and liability information functions, as well as for standard financial procedures.

Finally, Lawrence Bruckner, a member of the technical staff at the Los Alamos Scientific Laboratory in Los Alamos, N.M., offered a different and somewhat entertaining view of the cut-and-dried world of graphics representations. Bruckner proposed using identifiable forms such as a series of "faces" or trucks in varying sizes rather than the conventional bar, pie or line graphs.

The faces, devised by Herman Chernoff of MIT, are broken down into 20 different variables such as nose length, eye slant, ear position and so on. These variable possibilities are then matched with the variables of a group of corporations so that increased revenues might mean a longer nose, for instance, or exependitures might generate a particular head size, Bruckner explained.

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Consultant Cautions

Minis Can Put Hex on Small Business Users

By Tim Scannell
CW Staff

CHICAGO – Most of today's small business minicomputer systems are "unsuccessful" in the hands of the average user and lead to "anguish, agony and a great deal of midnight oil."

That rather dismal view of minicomputer system operations was expressed here at the recent Information Management Exposition & Conference (Info '78) by John Morris of Morris Consulting.

The biggest threat to the average user searching for the best minicomputer system is the salesman, who is traditionally less than honest and whose claims "border on science fiction," Morris said. Too many salesmen and DP afficionadoes promote the mystique and "mumbo-jumbo" of DP and fail to convey that computers are not magic and will not solve great problems.

Speaking to an audience made up of approximately 5% programmers, 15% DP managers and more than 60% controllers and account executives, Morris envisioned the day when "every business and maybe every home would have a small computer doing something."

However, before the executive or even the homemaker rushes to computerize, the potential user must decide what should and should not be automated, Morris remarked.

A Number of Considerations

How often a certain job occurs should be a primary consideration because repetition is what a computer does best, the consultant explained. Storage requirements, processing time, program complexity and the condition of the user's environment should follow in importance.

Operating systems should also be carefully considered by the small business user because many systems require a great deal of memory, sometimes more than half, leaving the user with very little to run necessary programs. The company's storage requirements, or how long the records must be kept, are also an important aspect in system selection, according to Morris.

Programming is probably the most important facet of the entire system, Morris said, because languages and coding will have an impact on "how long, quick and well" a person will be able to do his job. "When a programmer is good, he's very, very good," the consultant noted, "but when he's bad, he's horrid."

Coding techniques virtually dictate the way an entire file or system is built and can result in either system efficiency or wasted time. The programmer, therefore, should strive for perfection rather than speed and not use the machine as a crutch to catch all his mistakes, Morris warned.

Software packages and offerings should be considered before hardware luxuries, he added. The user has to decide between custom packages, utilities, applications, complete systems and combinations. "Developing a good package will usually cost more than a single-priced system," Morris pointed out.

Equipment Alternatives

A vast array of equipment alternatives are available. The neophyte tries to "do everything on a computer," Morris said. However, he should formulate job priorities.

After evaluating his needs, the user can choose from an accounting machine, personal computer, minicomputer, service bureau or "classical" DP, Morris said.

The user, by this time totally confused, has several supply avenues open. Major manufacturers will usually supply the hardware but leave the software to the user or some outside service. And distributors are the "car dealers" or fast-food merchants of the computer industry, interested in sales rather than down-the-road user satisfaction, Morris said.

The best channel to tap for system satisfaction, he suggested, is the system houses that offer "turnkey" software/hardware packages and "do the entire job."

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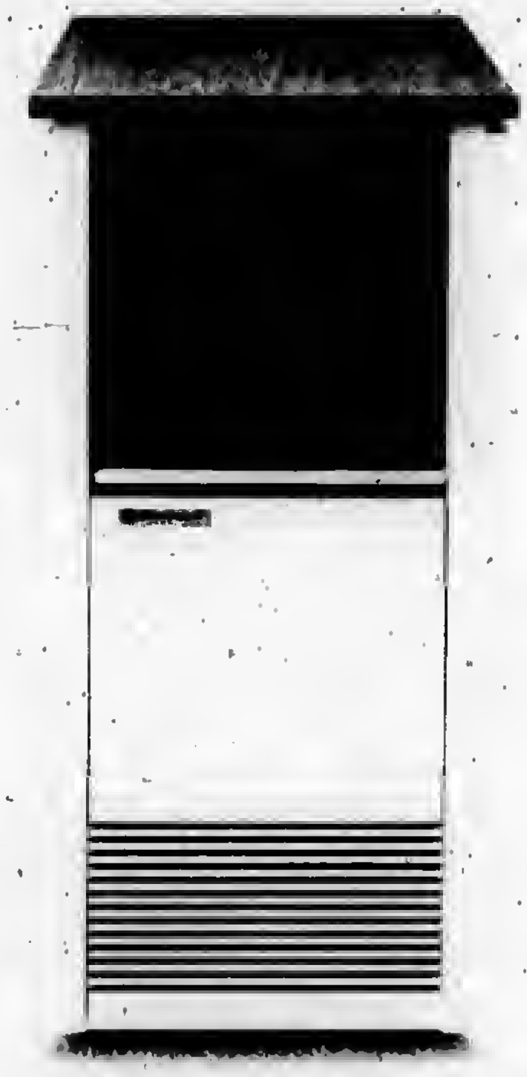

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Report Warns 'Hot Button' Contract Burns User

By Brad Schultz
CW Staff

WINTER PARK, Fla. — When negotiations for a DP procurement encounter last-minute financial or legal snags, the vendor can panic the user's DP staff into forcing top management to approve the deal. In the long run, a purchase made under such circumstances frequently proves unjustified both in performance and economic terms, according to a recent article in *CNReport*.

This vendor strategy involves persuading the DP staff that products encompassed by the sale satisfy its basic DP needs, such as increased processing capacity, the reduction of certain costs or the solution of a particular applications problem, the newsletter said.

Although the capabilities of these products may be desirable from a performance standpoint, they may not actually be needed, according to the article. One of the vendor representatives' tactics is to establish the promised benefits as needs in the user's mind.

After winning the DP staff's approval, the proposal can gather momentum and authenticity as it travels up the user chain of command, the article indicated. Advantages originally claimed by the vendor tend to be paraphrased and adopted by staff and management personnel at each level.

These people tend to avoid doing the homework necessary for proper evaluation and are thus biased by bad input from lower echelons, the report maintained.

According to the scenario, something goes wrong just after the decision to proceed with the deal is reached. This could be sudden detection of a legal loophole or unexpected trouble gathering funds for the purchase, the article indicated.

Scrambling to solidify the transaction, the vendor intensifies the climate of urgency by "pressing" the DP staff's "hot buttons": convincing it that dire needs will go unmet unless matters are promptly resolved.

The original proposal then undergoes hasty revision: "Equipment may be swapped out. Services may be added. Lease or rental terms may be lengthened or shortened. And a wide variety of hard or soft dollar concessions may be renegotiated or juggled," the article warned.

If the DPers have sufficient clout with their organization's top management, they may force unwise acceptance of the deal, the article pointed out. "This stage can be particularly frustrating for the user's professional legal and financial advisors" who "recognize the risks and problems of proceeding with haste and confusion," it added.

The benefits promised by the vendor often fail to materialize, *CNReport* maintained. For example, the agreement may allow relatively inexpensive use of certain hardware — on a temporary basis — to allow software conversion to a new CPU, but the user may discover the hardware will be required after the conversion at considerable additional cost.

Another possibility is that the user may agree to terms by which a large set of peripheral equipment is financed at an attractive rate over a period of several years. But this may prove seriously restrictive, compelling dependence on the original mainframe when other vendors introduce more appropriate systems, as well as limiting the scope of possible applications development.

Avert the Ploy

To avert the "hot button" ploy, the user should establish an active planning department so the vendor does not become the user's planning arm, *CNReport* advised. "A truly independent, qualified user planning team is less likely to believe a vendor proposal that is overflowing with blue sky promises."

In addition, the user should financially analyze all aspects of each vendor proposal. "Verify any and all vendor representations," the article said, and "when relying upon verifications supposedly conducted by subordinate user staff, ask enough questions to ensure that adequate procedures have been followed.

The article also recommended that all equipment lists be carefully documented and cross-verified. "When equipment configurations or soft dollar concessions are modified for any reason during the negotiating process, the vendor's initial 'savings' promises should be reanalyzed and reconfirmed before the agreement is signed."

Finally, "do not fall for the popular vendor ploys that create a false sense of urgency . . . Relax. Anayze and document each proposal with care, from performance specifications through financial and legal considerations."

CNReport is published monthly by International Computer Negotiations, Inc., 1331 Palmetto Ave., Winter Park, Fla. 32789.

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System Gives Doctors On-Line Access to Data

By Marguerite Zientara
CW Staff

BETHESDA, Md. — By pushing a few buttons, doctors with lots of questions and little time can access a wealth of on-line biomedical bibliographical information maintained by the National Library of Medicine (NLM) of the National Institutes of Health.

The seven-year-old system, accessible over direct-dial telephone lines or through Tymnet or Telenet, produces more than 2,000 "hits" each day, according to Sheila Proudman, technical information specialist at NLM.

The system serves about 1,000 medical institutions nationwide, with a very small number of terminals in private physicians' offices, Proudman said.

The system's main and most popular file is the Medline system, an on-line version of NLM's monthly publication *Index Medicus*, which is a reader's guide to periodical literature in medical journals, Proudman explained.

Also on-line in the system is Catline, a catalog of the library's books, Serline, a catalog of the library's serials, and A-V Line, a guide to the library's audio-visual materials, according to Proudman.

Three files are available in conjunction with the National Cancer Institute (NCI), Proudman said.

The first, a bibliographic file, cotains references to cancer-related journal literature, such as technical reports, monographs, journals and meeting proceedings.

Another NCI file available through NLM, Cancer Proj, holds the Smithsonian Institution's file of government-funded cancer research projects.

The third cancer file, called Clinprot ("clinical protocols"), has information on clinical trials of drug combinations for cancer therapy, Proudman said.

He explained that although most of the files are bibliographic, the Smithsonian file gives users abstracts of what each researcher is doing and the Clinprot file contains information on the drugs used, dosages given and results.

Another system file is Epilepsy Line, a portion of *Excerpta Medica*, a hard-copy private publication of bibliographical information on epilepsy.

Toxline contains bibliographical information on toxicity obtained by NLM from 10 secondary sources. Whereas *Index Medicus* is indexed by personnel at NLM, Toxline makes use of abstracting services in the pesticide and toxicity information field, Proudman said.

Another file, Rtecs, is an online listing of several thousand toxic chemicals put together by the National Institute of Occupational Safety and Health and issued yearly in book form, he noted.

The Rtecs file differs from the rest in that it gives an actual computation as opposed to a bibliographical citation, according to Proudman. For instance, a user could input "rat, oral, lethal dose 50" and the chemical's name, and the system would furnish the number of milligrams of the substance it would take to kill 50 rats.

As the key to all this information, there is a computer-aided instruction package to teach the user how to access the Medline system. A similar package is being written for Toxline.

Both contain the basics of on-line interaction as well as specific information on accessing each of those two files, Proudman explained.

File updates take place anywhere from monthly to quarterly, he said, depending on the file.

On-Line Since '71

Medline became generally available in 1971, with the other files coming on-line later.

It is basically a mediated system, with most of the terminals located in libraries, Proudman said. A physician or researcher who wants to access the system can go to his library and put in a request to the librarian or information specialist there, who will do the actual inputting and retrieval.

Most termainals are in medical libraries, with a large percentage in pharmaceutical and chemical companies as well. These firms primarily use the system's toxicology and cancer files, Proudman noted.

In response to a request for information, the user could get thousands of items of information or just a handful, she said, and noted that NLM prints out about 2,000 searches per day. That figure does not reflect the total number of searches made, however, because users can print out accessed information at their own terminals without a record being made at NLM.

The system runs on two IBM 370/158s, one in Bethesda, Md., and the other at the State University of New York computer center in Albany. Albany's system has 5M bytes of main memory and Bethesda's four million characters of main memory as well as more than 10 billion characters of direct access storage, Proudman said.

The system's subscribers use a variety of terminals operating at 300- or 1,200 bit/sec, he said.

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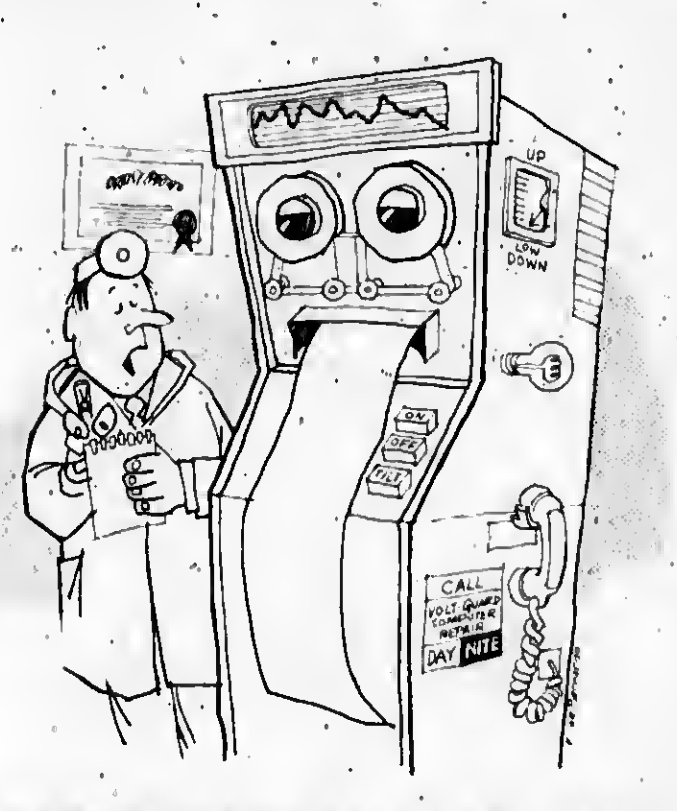

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Cruising Minis Help Snag Delinquent Drivers

By Marcy Rosenberg
CW Staff

BALTIMORE — People who drive with suspended or revoked licenses may soon hit a new roadblock — police patrol cars equipped with minicomputers that can rapidly screen a data base and identify a license place associated with various legal offenses.

This computer application was part of a four-year-old project developed by the Insurance Institute for Highway Safety (IIHS) in Washington, D.C., and implemented in cooperation with the Maryland Department of Motor Vehicles and Maryland State Police.

Code named Tags, the project was carried out in two parts.

In the first phase, a Hewlett-Packard Co. 2100 system, which stored a data base of offender license tag numbers on a disk file, was installed in a cruising van. If the operator keyed in a license plate number spotted on the road that matched one in the data base, the computer supplied a description of the vehicle and driver and the type of violation.

The operator could then radio this information, along with the vehicle's location, to a marked patrol car in the area to take appropriate action.

Police, Civilian Team

To make the screening method more efficient, the participating organizations decided to install computers in the patrol cars. Each car was manned by a civilian operator and police officer.

For this second phase of the project, IIHS chose to have specialized computer screening equipment developed for it because it found none commercially available that had the appropriate technical characteristics and could operate reliably in a police car where it would be jostled and could heat up when the car was parked, according to A. Eugene. Miller, IIHS vice-president of operations.

"We required mass storage for about 100,000 license tag numbers, each with about six alphanumeric characters, and for appropriate descripter data including driver age, sex and race," he noted. "Excluding descripter data, this would take up about 3-1/2 million bits of storage.

"In addition, we needed a one-second system response time from entry of license tag number to determination of whether a match occurred," he added.

The minicomputers, or "special-purpose query devices," as Miller prefers to call them, used in the second phase were built to IIHS performance specs by Prototypes, Inc. of Kensington, Md., which builds prototypes of electronic equipment as part of its business. The systems are not commercially available, Miller said.

The hard-wired systems consist of a mass electronic recirculating memory on a cassette tape with special-purpose manipulator and control units to analyze data from the memory and control the tape cartridge. A Qantex, Inc. reader reads in the cartridge.

This hardware was installed in the trunk of the police car. Mounted on the passenger side was a small CRT screen of alphanumeric characters and a console keyboard serving as the terminal to the computer system in the trunk.

Data Base

The Tags Cobol tape data base combined information provided by a Control Data Corp. CDC 3500 dual computer system at the State Motor Vehicle Administration with data from a dual IBM 370/145 system at the data center of the Maryland Department of Public Safety and Correctional Services, the DP support for the Maryland State Police.

Motor Vehicle Administration data included suspended, revoked, cancelled or refused license tag numbers, while the police department provided license numbers of stolen cars and of individuals who violated safety equipment repair orders.

To accommodate the Phase 2 systems, a Data General Corp. Nova 2/10 at the police data center compressed the data to between one million and 1.5 million bits of fast access memory and converted it via a Qantex read/write unit from the disk file format used on the HP, 2100 to a magnetic tape cartridge, Miller said.

Four beeps from the police car "terminal" signalled a match between an observed license plate number to one in the data base and a single beep indicated no match. Lights showed the type of violation.

According to an IIHS project summary report, the computerized mass screening process produced 13 times as many citations for driving with suspended or revoked licenses per 100 man-hours as were produced by the normal Maryland State Police mode of operation.

The Tags project has been temporarily suspended because of a lack of funds and police manpower resources, according to Robert L. Burkhardt, management information services representative for the Maryland Department of Transportation and project coordinator for the Motor Vehicle Administration.

"We may reinstitute the project to concentrate more on stolen cars," Burkhardt noted.

Audit Meet To Feature DP Topics

MIAMI BEACH, Fla. — The fourth annual Internal Auditing State of the Art Conference, scheduled for Dec. 4-6 here, will feature "the latest techniques, ideas and information" on the subject, according to its sponsor, the Institute of Internal Auditors (IIA).

DP will be discussed in such sessions as "Control Characteristics of On-Line Systems," "Implementing an EDP Auditing Process" and "Information Privacy and Data Security."

The program will also include industry group discussions and idea exchange sessions.

The fee is $295 for IIA members and $330 for nonmembers. IIA is at 249 Maitland Ave., Altamonte Springs, Fla. 32701.

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Predictions Can Miss Mark

Capacity Planning Seen Vexing DP Managers

By Howard A. Karten
CW Staff

CHICAGO — Many DP managers feel that capacity planning is a significant stumbling block for them and that they are losing credibility with upper management over the issue, according to Dr. Leeroy Bronner of IBM.

Speaking at a session entitled "Capacity Planning — A Necessary Component of DP Management" at a recent conference here, Bronner said that in his work at IBM's Federal Systems Center in Gaithersburg, Md., managers encounter problems with capacity planning. The consistent misses they record cause upper management to look at them askance.

While acknowledging that capacity planning is difficult, Bronner seemed to indicate that diligent and knowledgeable work can at least help to overcome inherent problems.

Basic Functions

The basic functions of capacity planning, Bronner noted, are establishing desired performance levels, identifying system bottlenecks, setting user service objectives, predicting and forecasting for the future and reporting pertinent data.

Although interest in capacity planning has revived lately, the subject is not new, Bronner observed. Rather, it is simply part of installation management and intersects with the handling of data bases, networks and equipment as well as the management of change, problems and performance.

Two important components of planning are the prediction process and system capacity itself. The prediction process requires a projected workload and an understanding of the loading scenario. Using a capacity planning method, new equipment requirement dates can be estimated, Bronner observed.

Three elements of capacity planning are workload characterization, system availability and system capacity, Bronner continued. System capacity is a function of several things, including resource utilization, actual workload, user service requirements (including response time and turnaround time) and capacity considerations in terms of CPU resources.

System availability, by contrast, has three major components, Bronner remarked. These are the hardware, the software and, most importantly, the user's perception of the system and its capabilities.

Workload characterization also is a process with several steps, according to Bronner. These include establishing CPU consumption of resources, broken down by subsystem (e.g. on-line, interactive or batch); identifying critical applications within each subsystem; distinguishing dominant activities; noting transaction volumes; and identifying peak transaction periods. It is important to have a profile of the entire workload to avoid getting a distorted one based on too small a sample. For example, if the workload peaks at the end of the month, a good representation will illustrate that part of the month, in addition to lighter days.

Users must realize available capacity depends on workload, the required resources for the workload and the interaction of these resources.

Several Useful Tools

There are several tools useful in capacity planning, Bronner told the audience. In order of increasing complexity, these are rules of thumb, linear projection, queuing models, discrete simulation, a systematic benchmark, network simulation and a full-scale benchmark. However, users should not get bogged down in the complexities of a full benchmark, Bronner cautioned.

Users should also realize capacity planning is a continuous, ongoing cycle, requiring feedback to improve the process. There are three steps in the cycle: data collection and reporting, comparisons of predicted and actual performance and performance analysis. Afterward, the process repeats itself.

In addition, capacity planning must be involved with organizational structure and office politics, Bronner said, because a capacity planning group, particularly if it is separate from existing functions, is often in conflict with preexisting experts.

Furthermore, coordination is needed among the operations department, the applications and the systems programming groups and the users themselves.

Responding to a question, Bronner said computer models to do capacity planning are still far off. Part of the problem is the scarcity of information on the topic, he noted.

UCLA Offers DP Training To People Already Working

LOS ANGELES — A computer science certification program designed to help working people with some background in mathematics or natural science enter the computing field has been established by the University of California at Los Angeles (UCLA).

UCLA's extension program, in a cooperative effort with the computer science department, has aimed this evening program at people who want formal training in computing without changing their current daytime working schedules.

By gaining DP skills for the first time or building on expertise already acquired, enrollees can achieve a Certificate in Computer Science; six required courses and two electives must be completed.

The required core courses cover programming languages, operating systems, compiler construction and machine organization and operation, a UCLA spokeswoman stated.

Electives are said to include "Applied Numerical Computing," "On-Line Computer Systems," "Computer System Architecture," "Simulation and Models," Introduction to Pattern Recognition" and Computer Networks."

Alternative for 'Disenchanted'

The university spokeswoman indicated the program is primarily intended to help the many "underutilized underemployed and disenchanted" people trained in the 1960s to serve the then-booming aerospace industry.

"In those heady days of the space program, math students were recruited and student loans forgiven for those who went on to teach," the spokeswoman explained. "But demand for mathematicians waned after the early days of the space program ... Math teacher recruitments plummeted." The computer software field offered an alternative for these people.

Many who receive their certificate are expected to go on to a master's or Ph.D. program in computer science, another UCLA spokeswoman stated.

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'Epilog' Only Real Debut at European Meet

CW at Ecoma-6

By **Don Leavitt**
CW Staff

LONDON — Like many other professional organizations, the European Computer Measurement Association (Ecoma) rules out direct sales efforts but permits technical presentations of products by vendors attending its periodic meetings. Ecoma-6, held here recently, included a number of such presentations.

Many of the vendors talked about computer performance measurement products that are familiar to the American scene but new to Europe. Only one session seemed to be the general introduction of a product: Candle Corp. of Marina Del Rey, Calif., used its time at the conference to announce the Epilog package as well as to introduce its Omegamon software monitor on this side of the Atlantic.

Epilog was described as a new approach to performance management using a "background monitor." Reports generated by Epilog relate the wait time of tasks directly to the hardware or software causes of the waits. It can show, for example, that production batch jobs in the evening were delayed 125 minutes because of tape mounts.

But the report does more than report the gross time for each type of error, a spokesman noted. Epilog would show in the example cited just how much time was lost by each job because of the delays in tape mounts.

Unlike Candle, which said it expects to be established with both marketing and technical support here by year-end, most of the other vendors are already in place in Europe.

Tesdata Systems Corp., which used the Ecoma meeting to introduce several additions to its MS-88 hardware monitor, was joined by the European representatives of Value Computing, Inc., who discussed computacharge, another scheduling support, and by Boeing Computer Services, Inc., which emphasized the software physics-oriented measurements supported by its Sara package.

New to the European scene, Tesdata's MS-108 channel event monitor, its message display unit and the MS-88 extended facilities were originally announced at the National Computer Conference in Anaheim, Calif., last June.

The channel event monitor is said to recognize channel activity and selected events on-line so correlations, if any exist, can be seen between hardware and software measures.

The message display unit provides real-time messages to alert the operations staff to problems. Certain conditions, if prolonged, affect response or turnaround time — or both — and must be halted as soon as possible.

The display unit lights up an appropriate message whenever one of these conditions is sensed and adds an audible alarm just in case the operator fails to notice the message.

Underlying both of these enhancements are the MS-88 extended facilities, which provide the user with a single source of performance data, interrelated to specific objectives, a Tesdata spokesman said.

Value's English representatives, RTZ Computer Services Ltd., outlined the capabilities of the company's schedulers and claimed they are particularly useful because they attack the scheduling problem on a data centerwide basis, not machine by machine.

In another presentation, BGS Systems, Inc. demonstrated its Best/1 computer system modeling package after the company's vice-president, Dr. Jeffrey Buzen, completed a major invited dissertation on the concepts of modeling.

Still other vendor sessions highlighted Boole & Babbage, Inc.'s monitoring packages, a Fortran optimizing package from Capex Corp. and an update of the Harmonie Hardware monitor from TITN of France.

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Ecoma Sees Future Success Dependent on Individuals

By **Don Leavitt**
CW Staff

LONDON — The success of the European Computer Measurement Association (Ecoma) is largely a result of "the support of the membership organizations," but the future will depend as much on the commitment of individual member delegates, according to the association's president.

Noting that some 270 delegates from about 200 organizations throughout Europe attended the sixth meeting of the group (Ecoma-6) at the Hotel Tara here earlier this month, performance analyst Scott N. Yasler of the Union Bank of Switzerland said he was very satisfied with the progress made by the two-and-a-half-year-old user association.

But it has been successful to a large degree, he contended, because of the organizations behind the delegates. Each organization pays 400 Swiss francs per year to belong to Ecoma, he explained, and that is enough to represent a fundamental commitment to the group.

With that much money committed to the cause, the organizations face only hotel and travel costs to send their people to the conferences. That sets up an atmosphere quite different from the U.S., where professional bodies tend to have individual memberships and interested people have to sell management on the value of their going to any given conference, Yasler said.

Ecoma itself is organized around nine working committees, each keyed to a special area of interest within computer performance evaluation (CPE). In addition to attracting users with special interests, these committees, through their chairmen, serve still another purpose, the president noted.

Each of the committee chairmen is from a separate country. Therefore, Yasler pointed out, a prospective member is likely to find someone from his own country on the association's letterhead and feel more comfortable about asking questions.

Ecoma-7 will be held a year from now in Paris. The location of the eighth meeting, in the fall of 1980, is still to be decided.

Although the meetings will be less frequent, Ecoma "delegates" and anyone else interested in CPE will be challenged in the very near future if plans for a "substantial" international journal — "probably a quarterly at least in the beginning" — come to fruition under Ecoma's aegis.

Yasler would like to get contributing editors from every country — "This effort is certainly not just limited to Europe," he emphasized — with the idea that these editors would be able to extract at least one article from their countrymen for each issue.

More information about Ecoma and the proposed journal is available from Yasler at Scheuchzerstrasse 5, CH-8006, Zurich, Switzerland.

Bank Analyst Says

Modular Programs Yield Performance Benefits

By Don Leavitt
CW Staff

LONDON — A conference on computer measurement may seem a strange place to talk about the benefits of modular programming — and of generalized I/O modules in particular — but the Bank of Scotland has used just such approaches, and they do have performance implications, according to analyst Stewart Stevenson.

Addressing a session of the sixth meeting of the European Computer Measurement Association (Ecoma-6) in mid-October, Stevenson said the bank's experience with tailored I/O modules "over the past 10 years or so" had resolved some of the issues raised about its suppliers' hardware and software.

But, he warned, the effective use of generalized I/O modules depends on an installation's willingness to study and understand the environment available from the vendors.

Currently the bank is working with two 1M-byte IBM 370/158 (plus a 1M-byte 370/155-2 as a backup), 1419 Micr check reader/sorters, 400 IBM 3980 banking terminals and a number of Synchronous Data Link Control (SDLC) - oriented 3270 CRT terminals interfacing with the international banking network, Swift.

Modular Programming Introduced

When the bank moved to the IBM 360S in 1969, it introduced modular programming, enabling more programmers to work on one program, to "considerably" shorten compilation times and control testing and to tackle bigger, more complex developments, such as teleprocessing systems, Stevenson said.

Inevitably, he remarked, the introduction of modular programming led to the exchange of modules between projects and the growth of a body of general-purpose modules (GPM). To manage the use and development of GPM's most effectively, the bank's system programming group was made responsible for them.

There are now a very large number of GPMs "and they differ very little from those that should be in any programming shop." But their value, according to Stevenson, is perhaps best illustrated by the way some of the very early ones have been adapted to changes in the bank's operating environment, from DOS through OS/MFT to SVS.

The module that originally triggered job-timing statistics, for example, has been enhanced to ensure the statistics are collected even if the job ends abnormally. It also triggers automatic check-pointing and works with output to the computer output microfilm (COM) which the bank has now installed.

Expensive Annual Costs

While it is "clearly possible" to obtain productivity benefits in the programming shop through the use of GPMs, Stevenson said, it is also apparent that "some price" may have to be paid, especially in terms of computer resources.

He noted, for instance, that the bank generates "about eight million" lines of print on an average day. Moreover, the extra problem program CPU time used by the print GPM "as against a simple assembler alternative" is "about 16 minutes across all three CPUs." Thus, Stevenson said, the annual resource cost of that module is 67.2 CPU hours.

In utilizing nongeneral I/O modules for the majority of its nonprint I/O, however, the bank also incurs costs, he noted. There is a need, conservatively, for some 500 such modules each year. Each module takes about 16 man-hours to develop, so the annual cost is some 8,000 man-hours plus the maintenance effort required for these special modules.

CW at Ecoma-6

By comparison, use of the GPMs for printing and for reading "bypass the writing of nearly 400 modules a year." Use of the well-exercised modules generally causes no problems — which "cannot be said" for the special modules — so maintenance is also reduced.

Stevenson told his audience the bank invokes the GPMs through a CALL. This simplifies the interface and makes it possible to introduce an improved version of a GPM "whenever we wish, without the necessity to relink-edit every load module we possess."

"I believe the use of GPMs do the one important job that is allocated to them — to manage," he concluded.

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Editorial

On the Threshold

It was not too many years ago that packet switching was regarded as an experimental concept that evolved in research environments for exotic applications. But packet-switching technology has progressed at a rapid pace, and today it is very much a part of the communications options available to the business data communications user.

In the U.S., Telenet Communications Corp. and Tymnet, Inc. provide public data network facilities that use packet-switching methodology or, in one case, a modification of it. These services are somewhat unique in that they are offered by independent noncarrier firms. AT&T recently announced its Advanced Communications Service (ACS), which will include X.25 compatibility, making it compatible with networks now emerging in other countries.

The X.25 standard was finalized several years ago by the Consultative Committee on International Telephone and Telegraph. Its emergence marked a standards-making effort that progressed at breakneck speed compared with the length of time it usually takes for a standard to be finalized.

Last year's X.75 and X.121 standards paved the way for the interconnection of public packet data networks on an international basis. U.S. users can already access data bases in Canada using the facilities of Datapac and Telenet.

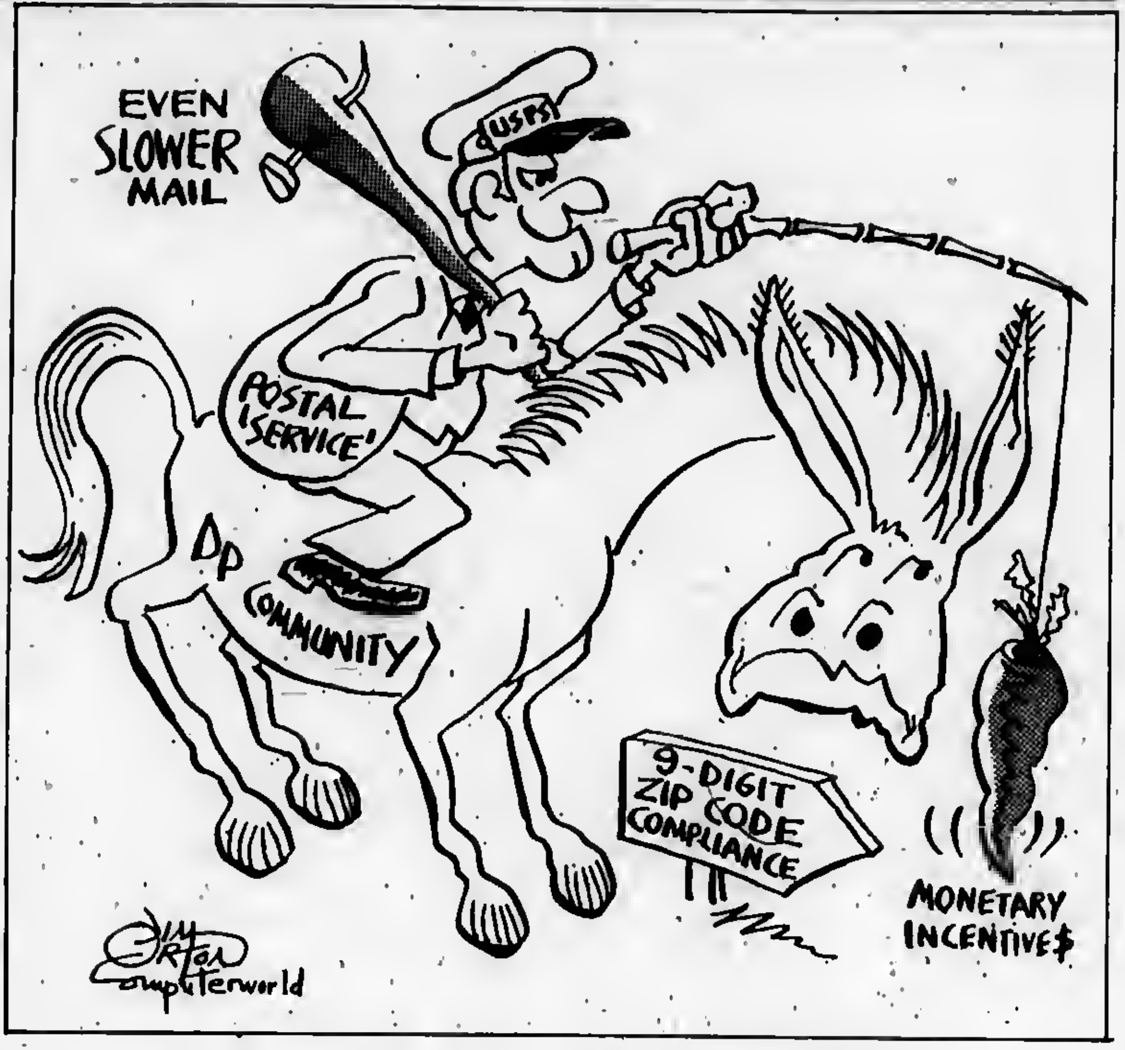
The stage has been set for true international communications. Along with this prospect has come concern for a host of societal issues, such as those considered at the recent International Conference on Computer Communication in Kyoto, Japan. These issues — personal privacy, security, data integrity and transborder data flow among them — are very real.

And there are still other problems to be solved, not the least of which is how the average user with a private-line, in-house network can take advantage of the public data nets. One solution may lie in the private packet networks now being configured by some large users.

It is still too early to predict the role that public packet nets will play to meet the communications needs of the average business user. It appears they will offer economical network facilities to smaller users which otherwise might not be able to afford an in-house data communications network.

The packet nets also hold great promise in the area of electronic mail. Unfortunately, this area is mired in regulatory and legal constraints that make a prediction of widespread use very questionable.

Nevertheless, packet networks have fulfilled their potential in a few short years. Users appear to be on the threshold of innovative services amid interconnected global networks.



Data Past

Five Years Ago
Oct. 31, 1973

WASHINGTON, D.C. — Solicitor General Robert H. Bork was quoted as saying, "the government's suit [against IBM on antitrust grounds] stands revealed as an attack on outstanding commercial success as such." Bork was given the responsiblity for pursuing the IBM antitrust case in the wake of President Nixon's firing of special Watergate Prosecutor Archibald Cox and the subsequent resignation of Elliot L. Richardson. Bork was known to feel the government's case against IBM was unfounded. He stated his belief that IBM attained its position in the computer industry through superior efficiency.

— — —

LOUISVILLE, Colo. — Storage Technology Corp. (STC) announced the 8000 series disk storage subsystem. The series was designed as a replacement for the IBM 3330 disk subsystem in applications where users had high volumes of data with low to medium data accessing activity.

Eight Years Ago
Nov. 4, 1970

WHITE PLAINS, N.Y. — IBM announced its newest version of the System/3 Model 6. The keyboard-oriented system was programmed in Basic and included disk capability and ledger card use. The system was priced at about $1,000/mo for a typical configuration.

— — —

WASHINGTON, D.C. — Hearings initiated by the Labor Department and the Association of Data Processing Service Organizations were to probe the question of computer programmers as "professionals." According to reports from these two organizations, one result of achieving such official status would be a programmer's exemption from minimum wage and overtime pay laws.

Letters to the Editor

No Big Problem With Zip

I don't see a big problem with Zip Code conversion to nine or 12 digits. The primary hassles are determining the new digits (or letters?) and finding room in the master files and printout to put them.

To solve the first, the U.S. Postal Service has available at $1,000/year an IBM 360/370 Assembler program, Zipmatch, that converts mailing address to Zip Code at 100,000/hour with 85% success.

As for finding room in master files; I'm just going to put it where CITY used to be. If the Postal Service can deliver to buildings by the new Zip number, certainly spelling out the city for delivery instructions is archaic. I'll retain the five-digit Zip Code where it is for my existing programs, so no reprogramming will be involved.

My problem will be in converting out first class presorted mail package for the IBM System 32/34. With these extra four digits, the U.S. Postal Service will probably make the traying requirements for discount first class even more nefarious.

John Davenport
York, Pa.

Discussion at New Low

The continuing discussion on the utility of arbitration has apparently hit a new low. Surely there must be more meritorious arguments against arbitration than untrue statement about NCR Corp.'s program contracting policies. If Alan Taylor has to resort to those kinds of allegations to argue against arbitration, his position is indeed shallow [CW, Oct. 16].

We take particular exception to Taylor's statement that users of NCR Criterion computers are dependent on the company's good will and his characterization of imagined future actions by NCR as "chicanery."

Every user of software under the NCR Universal Agreement receives a license for a term (period of years, for as long as he uses the equipment, etc.) and upon certain payment provisions (included in the price, separate one-time charge, periodic payment, etc.).

Whatever the terms, it is an enforceable license. We have every confidence the arbitrator will respect it.

The Universal Agreement states very clearly (except possibly to Taylor) that upon resale, the customer can transfer the software if a second owner agrees to protect NCR's legitimate proprietary rights and trade secrets.

In actual fact, NCR's customers have a great deal more protection regarding software than most users. Their ability to resell equipment is not dependent on NCR's good will, but is guaranteed. Taylor's apparent belief that NCR would deliberately destroy its user base is ridiculous.

Taylor was wrong when he said courts interpret contracts to protect one party such as the customer. They interpret contracts to determine the intent of both parties. He was also wrong when he assumed that a mere allegation of fraud somehow will lead a court to disregard the provisions of a contract.

No one has ever maintained that arbitration is a panacea to either party. The danger in believing Taylor is that his comments might cause some users to conclude that courts are.

Ben E. Olive
Associate General Counsel

(Other letters on Page 23.)

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

White Hat, Black Hat

U.S. Image Poor at World Information Meets

By Herb Grosch
Special to CW

I attended the recent conference on Strategies and Policies for Informatics (Spin) in Torremolinos [CW, Sept. 11] as an adviser to the Intergovernmental Bureau for Informatics (IBI). The other sponsor of the conference, and the source of much dissension and ugliness, was the Paris-based United Nations Educational, Scientific and Cultural Organization (Unesco).

Representatives of 80 nations were present and the focus was on the less-developed countries (LDCs) — the most recent euphemism for Togo, Bolivia *et al.* Representatives of Red China and the Vatican were also present. The most notable absence was that of Japan, the Number Two in world information science and a major aspirant to the role of hardware supplier to the LDCs, especially in Asia.

Bear with me while I set the political stage; it's complicated. Once upon a time [sigh!] almost nobody had computers. I'm talking about the early '50s; there were a few Univac Is and a few IBM 700s, and the British had shipped big Ferranti machines to Kelly Gotlieb in Toronto and to Italy. There were Deuces and Leos but only in England, and the American machines were likewise domestic.

Countries without easy access to computers hungered for hands-on experience. So, with Unesco support, an Internation Computation Centre was organized in Rome. The idea was to install a major machine, perhaps donated by a rich manufacturer, and let Uruguay and Iraq run scientific and government work on it. This was to be free of charge, at least at the beginning, as I remember the plan.

Well, it didn't jell. A director was appointed — an Italian. A few staff people, notably a great secretary named Annie and a wild Sicilian chauffeur, were hired. But nobody gave them a computer. They put out computer center directories for the rest of the world (the U.S. was growing too fast for them to catch up). They sponsored a few European meetings. But their presence was not valued, and hence they got little funding.

Several directors and a dozen years later, a new charter turned the computation center into IBI and a mission to aid development of computer applications, largely governmental, in the less advanced countries was adopted. Trouble was, lots of LDCs signed on (at minimum subscription rates). But the majors — the U.S., Britain, West Germany, Canada and Japan — had never wanted or needed to join the computation center and saw no reason to spend money and time on IBI when it came around. Call it selfish if you will, or simply put it down to unattractive and unimaginative management in the '60s at the center — the U.S. and UK stayed away.

Meanwhile, IBI was trying. It got a smooth new director, an Argentine named Bernasconi. France, Italy and Spain contributed, the former with an eye on sales of hardware and software from its national enterprises, especially in North and West Africa. Cost Paris the earth, it did, and they grumbled. But they paid.

While I was president of the Association for Computing Machinery, I wrote a three-way letter to Pasty Mink, now departed, and Maines at State, and to Jordan Baruch at Commerce, advocating reconsideration of American nonadherence to IBI. I argued that since most of the LDC installations from Chile to Nepal were of U.S. origin, we sort of owed it to the poor devils.

I also said that, as the government of the (by far) most important computer-using nation, they ought to join everything — as IBM does, for instance. And on the practical side, I mentioned trade by American hardware and software houses and the incursions of the French.

Well, the answer was no. I appealed, suggesting some strategies which included other hold-out countries as well; no answer at all on that one. I put it on a back burner.

But as the long planning for the Spanish meeting progressed, it became clear that all of the majors (except Japan, as it turned out) and most of the Eastern Europeans

(Continued on Page 22)

Reader Commentary

Analogies Help Clarify DP Basics for New User

By Jim Ryan
Special to CW

During the past few years, the numbers and types of people using computers have changed drastically. The change has been from a relatively few highly specialized people using expensive machines to a large number of people using comparatively inexpensive machines.

These people would like to see the computer as a rather simple machine that can be operated with a minimum of effort like most household machines.

Unfortunately, the only machine that comes close to this objective is the hand-held calculator, which is not considered a computer by DP professionals, in spite of the fact that it performs most of the functions the original computers performed.

The major and most significant difference between the calculator and the computer is the lack of memory storage in the standard calculator. Because of this there is no need to move information from storage to the mathematical processor.

This difference has created misunderstandings between the new computer user and the professional computer systems designer, who spends most of his effort providing means for storing and moving information.

With this thought in mind, I would like to attempt to describe computers for new users in terms that relate to the new user's general background.

To establish this common base, I am going to attempt to relate the computer to a library and an adding machine, two familiar tools.

First, the library. Every book in a library is cataloged and assigned a specific code number. The number of digits in the code number is based on the filing system established by the librarian.

A computer can be compared to the library in this function in that the items to be coded must be identified and studies made to determine the number and type of digits to be used to ensure a good filing system. This is one of the first things that frustrate the new user. Just the thought of setting up the equivalent of a new library file before the computer can be used scares many people away.

The problem doesn't stop here, however, because just as in a library space must be allocated for the storage of books, in a computer, space must be allocated in the machine's storage section for the items that must be stored.

In the library situation, it is a physical problem and the librarian usually can, with a lot of careful planning, make maximum use of the space available.

In the computer, the job of properly storing information to attain the most efficient use of storage capacity and speed of information retrieval is a science in itself. New users should be aware

(Continued on Page 24)

The Taylor Report

Major Audit Firm Cited For Unethical Practices

By Alan Taylor
Special to CW

An unexpected result of the questionnaire "Do Auditors Need Curbs?" [CW, Aug. 7] was the emergence of one of the "Big Eight" auditing firms, Arthur Andersen & Co., as suspect of the "worst" practices.

E.G. Marchi, president of Control Information, Inc., a systems software firm in Oakbrook, Ill., said that other auditing firms are guilty of bad marketing practices but that Arthur Andersen is the worst offender.

All of this interested me, so I went to Detroit to see for myself how Arthur Andersen had been conducting its business since it attained a foothold in city government seven years ago.

The city of Detroit has an auditor-general and an external audit is carried out every five years. In 1973, for instance, the audit was performed by Coopers & Lybrand, and this year the auditors are Price Waterhouse & Co.

Various city government agencies — for example, The Board of Education and the Water Department — have their own auditing arrangements.

As far as I know, Arthur Andersen first appeared on the scene in connection with the Board of Education from 1971 to 1972. It got the job of auditor with a low bid of $12,500 for the year's work.

And this seems to have marked the end of competitive bidding for auditor, consultant and software supplier. Between 1974 and Feb. 23, 1977, there was no competitive bidding, and Arthur Andersen collected some $916,067 in fees.

One City Council member talked publicly about "payoffs under the table to board members." Still, Arthur Andersen continued to act as auditor for the Board of Education in full knowledge that it would be examining nearly $1 million worth of consulting it had provided.

The Board of Education voted in October 1972 to develop internally a new personnel payroll system. In February 1975, after two key board employees left the implementing team and without any further vote, Arthur Andersen was called in.

The 1972 vote reportedly made it unnecessary to get formal board approval of the Andersen project or to call for competitive bidding. Under the recommendation of Clement Sutton, the Board of Education's finance director, Arthur Andersen was recommended for the job.

Meanwhile, in Detroit's Water & Sewerage Department, Arthur Andersen was making more money. In January 1976, a request was made to give Arthur Andersen two contracts at once — $130,000 for a study to create a computerized process of setting future water and sewer rate increases and $906,000 to provide

(Continued on Page 26)

Reader Commentary

Irani Users Need Guidance to Avoid Waste

By Hassein Mobayeni
Special to CW

Having had five years' experience in DP systems and having completed an M.S. in computer system applications, I question "Irani Government Termed 'Computer Junkyard' " [CW, Sept. 18]. I would like to suggest that the best solution to Iran's problem would be to put a stop to the most disastrous rip-off that has been perpetrated for the last five years upon the government.

During the last five years, at the Shah's orders, the government has bought more and more expensive machinery, to the point where there is 0% utilization of the 150 installations under the care of novices.

I am not alone in thinking that there are several principal phases that must accompany computer acquisition.

Analysis and design are the first steps in developing a new technology. This phase must identify economic justification, design alternatives, system requirements, system specifications and programming language. The novice user, of course, should not be responsible for these steps.

How could the vendors, who are competing to get rid of their wares, have conducted such analysis for 150 installations? Can 150 installations completed over an 18-month period be successful? Does the user of a Univac 1110 know the system and what the system can do for him?

In the selection phase of acquisition, a selection plan, accurate specifications, size and evaluation criteria must be established. These are more important than setting off a race among, again, novices.

Who is the novice user or vendor? Should the Ministry of Education be the training place for vendor personnel? Are the vendors looking for hardware financial support? They still have a large software market in government agencies in the U.S.

In the installation plan, a schedule should be set up for making sure power, communications links and temperature control are adequate. It should be the vendor's responsibility to lay out the schedule.

Over the past five years, computer manufacturers have been delivering systems to the purchasing organizations. The time has come for the Irani government to put a stop to this before it gets ripped off more.

Without a plan for educating the user in the basic functions of DP in order to keep the user from purchasing for prestige, and in order for the user to understand the demands of DP, it would be better to go back to manual systems. *Mideast Computer* could be helpful in introducing the computer and explaining what computers can do.

The reasons for huge and expensive contracts may then be understandable.

Moboyeni is an employee of the Irani government. He recently received his moster's in computer systems applications at American University in Washington, D.C.

U.S. Giving Poor Impression at Meets

(Continued from Page 21)

would attend, not as IBI members of course, but as members of Unesco, which was a cosponsor. So I probed a little in Washington and found that an American delegation would indeed be sent.

Chance to Contribute

Even if the decision, taken somewhere down in the basement at Foggy Bottom, not to join IBI was not reversed, there would be a chance for us to contribute to the discussions and offer advice and friendship. The hegemony of the U.S. is deeply resented in many of the LDCs, and our manufacturers (notably IBM, which had two very attentive attendees from World Trade at Torremolinos) bear the brunt of much of this resentment: Hewlett-Packard Co. has troubles in Iraq, IBM was run out of India and CII/Honeywell Bull gives all of our boys a hard time in the French-speaking LDCs.

The delegation was an utter disaster. There was one White Hat, the president of the National Association of State Information Systems (Nasis). But the leader was a retired Unesco politician named John Fobes, now teaching at Duke, who clearly didn't know a transistor from a toggle switch. With him was a meek soul from Commerce's National Technical Information Service (NTIS), who cleverly brought no samples of his dubious wares, and a chap named Pikus from the defunct Mink purlieus at State, reasonably knowledgeable about sensors and the space program, but with only trivial knowledge of our trade.

Fobes clearly had been instructed to keep a very low profile indeed — which of course was all he *could* do, with that crew and his own complete lack of experience and interest in the field.

The British delegation was a startling contrast. It was headed by my old friend Reay Atkinson, head of the Central Computer Agency in Whitehall and now head of the Department of Industry activity pushing British interests in hardware and software. He had the head of the British Computer Society, the head of the computer services trade association, the head of the National Compter Center (education, seminars, publications), a senior executive from International Computers Ltd. and a couple of intelligent gofers to help him.

Guess who looked good?

Moreover, our outfit was not only imcompetent and (by instruction) cowardly, but biased. The meeting divided over and over again between IBI and Unesco adherents. The British and the Canadians, although not IBI members, played it cool. The French, members of both, and with a huge and alert delegation, did likewise. Fobes, who was presiding officer at one session, was so clearly a creature of Unesco as to be embarrassing to the few Americans present.

I had to sit and fume. Pikus knew of my ACM letters to State; Fobes obviously had never heard of ACM or of me in his life. The others perforce kept still.

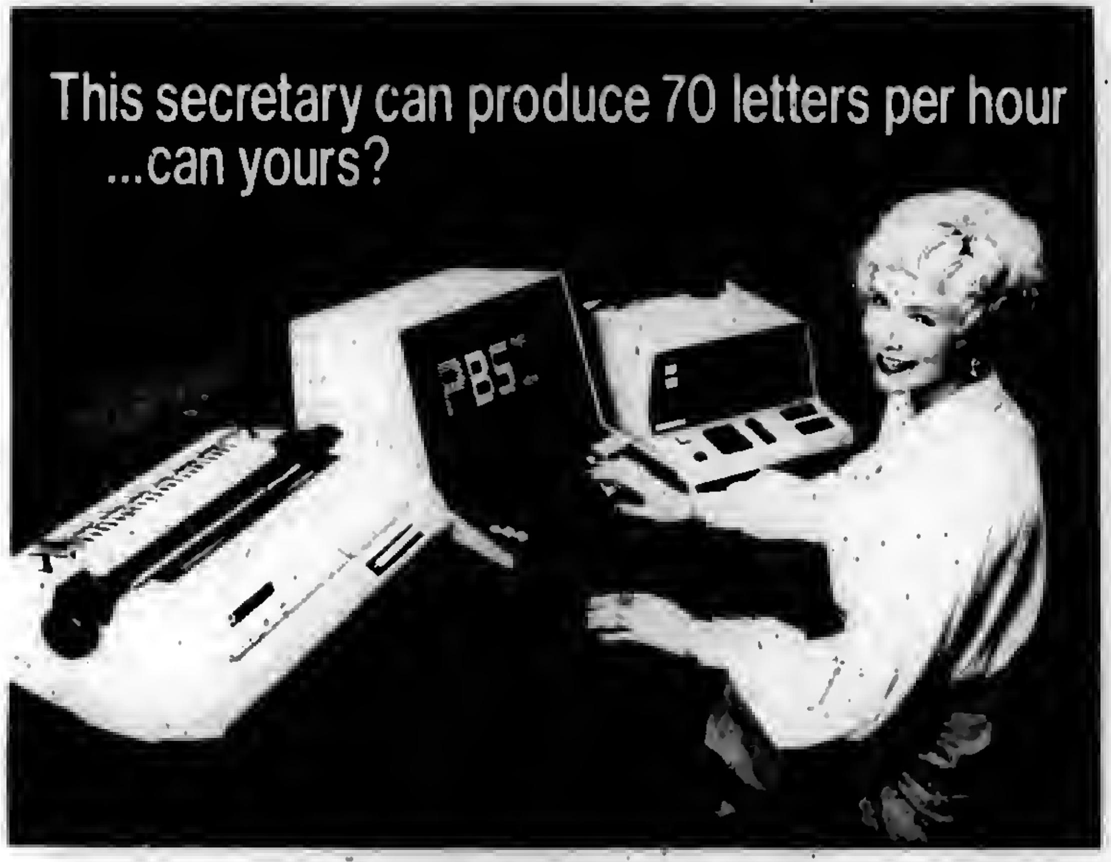
So, when the Nigerians excoriated IBM ("certain dominant multinationals") and demanded free training, better documentation, cheaper prices and general subservience, our mealy-mouthed diplomats suggested minor changes in wording.

Did they boast of what we'd done worldwide? Did they defend our economic system? Did they offer bilateral cooperation, as the British very effectively did? Not they!

No, the U.S. won't join IBI or give any evidence of concern for computer hunger in the LDCs. Our image was poor when Torremolinos convened; it was mud as it ended.

What a state! What a State!

This secretary can produce 70 letters per hour ...can yours?



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Letters to the Editor

Standard Architectures Needed by Users

Surely I am mistaken, but my impression of the editorial "Procurement Paradox" [CW, Sept. 25] was that you are trying to snuff out discussion of architecture-specific procurements. In veiled threats of "devastating impact on vendors" and "vendors would need years to react," the editorial implied that the U.S. government is foolish for brewing up another poor solution to a complex issue.

I am a user, not a vendor, and my hat is off to the Appropriations Committee for realizing the trend in the computer industry toward more and more plug-compatibility. The prices of equipment components have plummeted in the last decade because of plug compatibility and will continue to drop if we continue to support the trend.

An architecture-specific procurement policy is the user's way of achieving plug-compatible software; it is his way of saying I will take any new computer model as long as it is compatible with my existing programs.

There is no way of truly achieving plug-compatihle software except to specify the architecture of the new equipment.

It seems each new issue of Computer*world* reports another plug-compatihle manufacturer. The trend is apparent: Technology has matured to the point where progress is not achieved by different architectures; it is achieved by preserving software and riding the crest of price/performance breakthroughs.

The time has passed when an architecture specification can be thought of as non-competitive.

Users have waited long enough for higher level languages to provide portable software. Why wait any longer? All we need is standard architectures.

Kenneth Blythe
Manama, Bahrain

Blatant 'Sexploitation'

I wish to address a hlatant case of offensive "sexploitation" in the Sept. 18 edition of *Computerworld*. On page 6 of Hewlett-Packard Co.'s 10-page ad was a display that was repugnant to my sense of morality and fair play.

The use of a humanoid form to exhibit a high degree of "human" engineering was an admirable ploy for HP, hut the figure shown was far from a mere representation of engineering finesse. The fact that the figure was female was not in itself unethical, but the figure was also ohviously nude.

A comparable display of the exacting engineering professed by HP could have been accomplished by using either a clothed figure or one devoid of sexual characteristics. It would seem, then, that the glaring aim of this portion of the ad was not to appeal to the reader's technical sense but to baser, "animal" instincts.

I am neither a "woman's libber" nor a male chauvinist. I'm an intelligent, fair-minded member of the DP community who finds this type of technical "pornography" and sexploitation abhorrent.

I have hesitated this long to see if anyone else would write about this particular issue but have yet to see any mention of it in the paper. Either I've passed over it or the DP community is becoming blind and/or decadent. I hope neither is the case.

H. Andrew Shirley
Mulberry, Fla.

Case of Shortsightedness

The editorial "Zapped by the Zip" [CW, Oct. 9] only showed the weaknesses and the shortsightedness of the DP community. Are we to believe that the design of programs using postal addresses rests on the number of digits in one data item?

As for a significant hike in I/O costs: I live on a street with 10 characters in its name. Should we truncate this to 16 bits for the convenience of our machines?

Will you also lobby against the 21st century since so many of our programs have 19 wired into their dates?

CW's contention that the Postal Service must reasonably argue that any proposed changes must benefit the society it supposedly serves is true, but likewise the DP community also has a responsibility to benefit the society it supposedly serves.

Paul D. Lever
Carlsbad, Calif.

Old Enthusiasm Gone

R. L. Glass certainly qualifies for higher management [CW, Aug. 28] — he got hold of the wrong end of the horse completely. Stop worrying about the private efforts of Mal Microbus on company time, and worry about the enthusiasm Mal steals home at night.

"It's a personal computer" .... "Mal bounds down the stairs ... his mind seemingly locked in another world." Hey, management! Mal used to be like that at work, too. Then you took it away from him ... his enthusiasm, his project, his prido.

The manager who offers his subordinates active participation and a worthwhile goal needn't monitor employee briefcases.

What happened to all those guys who wouldn't go home? They were having too much fun.

Phil Good
Kalamazoo, Mich.

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Reader Commentary

Definition of Software Cannot Be Dictated

By Robert M. Sherin

Special to CW

"Identity and image — that is the most serious problem facing the software products industry today." So wrote Martin A. Goetz in an informative feature, "The Software Products Industry: Its Future and Promise" [CW, Oct. 16]. What Goetz wrote about the software products industry can also be applied to the data processing industry in general. People simply don't understand what we do.

Output is readily understood, but the word "software" presents problems carrying multibillion-dollar implications for DPers. Goetz suggested the word stand for "one of the machine components of a computer system." Others say "software" is computer input. Caught in the middle are lawyers, not knowing what to think, proposing a single definition.

There can be no monopolistic claims to the word "software," no single definition dictated to DPers. The industry should not be deprived of the benefits of recent decisions under state tax laws construing software as tax exempt computer input.

Software's definition in those cases translates to broad exemptions, basically because it makes no sense to tax those working with input and exempt those working with output. Moreover, an exemption across the board amounts to professional status under the sales tax law — parity with lawyers and accountants — the object!

Let the word "software" develop to reflect custom, rather than dictates.

Sherin is a nonjudicial legislative adviser to the Data Processing Management Association.

Analogies Clarify DP for Users

(Continued from Page 21)

of the fundamentals of this problem so that they at least will be able to convey intelligently the amount and type of information they want stored so that the professional programmer will be able to do a good job.

In any case, the user must not be like the owner of a new house who continually wants to change plans during construction and eventually ends up with a very expensive disaster.

Now that we have discussed filing and storing, the next item to be covered is the movement of information. In the library, this comes in two basic categories.

First is the control of books being checked out and returned. There are many systems, some quite elaborate, which have been developed for this purpose.

In the case of the new computer, the user must establish a system for adding and removing information to the machine's storage capacity. In the modern DP world, many quite complex machines have been developed with elaborate methods of entering and retrieving information.

Just the problem of maintaining security and privacy of the stored data has resulted in quite extensive coding systems.

The second problem in moving information is illustrated by the case of the librarian who wants to move sections of books to make room for new books or different categories of books. This also requires careful planning by the librarian.

In a computer, this problem occurs quite often as the user's needs change. A good systems designer will anticipate most changes so that the number of times stored information has to be moved is kept to a minimum.

This very briefly covers the functions of a computer as compared to a library and leads us to the second item, comparison to the adding machine. For this, we will use the hand calculator.

The user of the standard calculator with no significant memory can usually operate it on a step-by-step basis using a manual document as the source for input. The simplest operation is adding a column of figures. The operator enters the first number, presses the "add" key which tells the calculator to get ready to add the next number entered and so on until a total is requested.

In a computer system, the user must first set up a process for obtaining the required data from storage and then move it to the processing section of the computer before the mathematical process can actually begin. This means a computer system must have information transferring capabilities as well the ability to file, store and calculate.

Part of the information transfer process must include a system that will select, under the operator's direction, those specific items to be manipulated and the order in which they must be manipulated to obtain the required results. This can be — and usually is — an elaborate process.

To summarize, the new computer user must be prepared to define the data to be used in the computer in precise, types and amounts, set up proper filing and storage systems and arrange to find a means of transferring data from storage to a mathematical processor.

Finally, when all of this has been accomplished, all of the raw data for the user's application must be coded and properly input to the system.

By this time, it must be obvious to the new user that buying or leasing the computer may actually be only the final result of all the studies that must be made prior to that decision.

The amount of study the user must undertake is somewhat related to the total amount of data to be controlled or processed.

For example, the use of the ordinary hand calculator needs very little study if all that is required is the solution of a specific problem. However, if the application requires any amount of stored information, then the whole problem of filing, storage and transfer of information must be explored. Usually the greater the amount of information to be processed, the more complex this portion is.

Up to now, I have deliberately avoided the use of DP jargon. Understanding computer phraseology will be another challenge for the new user as strange words are tossed around as if they were commonly used by the general public.

Strangely enough, if the user listens closely, he will find that most of the words are based on their English meaning but they seem to be in a new context. Further, the user will find that the more sensitive professional computer people will be able to communicate with the user without excessive technical jargon.

All of the filing, storage and movement-of-information studies are covered in a term known as software — as opposed to hardware, or the physical components of the computer. Software is well named because it certainly requires a lot of tender loving care, and if help wanted advertisements are any indication, software people are in great demand. The user should pay particular attention to this part of his installation.

The new user should be prepared to work hard but the rewards of careful planning are well worth the effort. The larger the installation, the greater the need for careful planning.

Ryan is a retired DPer.

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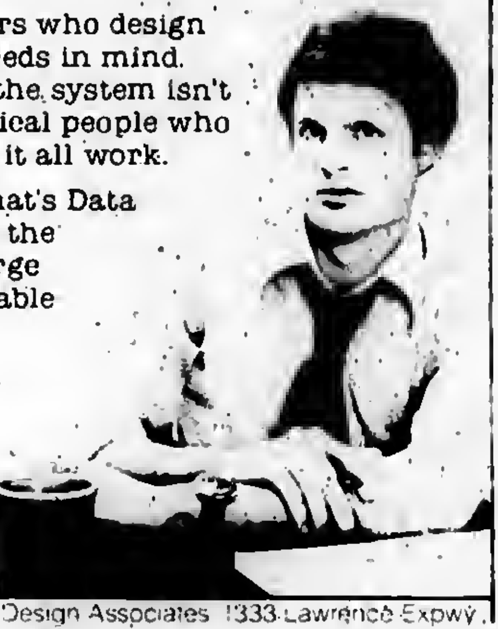

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Audit Firm Faulted for Unethical Practices

(Continued from Page 21)

the final phase of a customer billing and information system as well as the preliminary phase of a water and sewerage model.

Arthur Andersen already had a $630,000 contract with the department including $95,000 for the initial design of the customer billing system, $355,000 for the design of a personnel payroll system and $180,000 for the plans for a financial reporting and accounting system.

The reason for the "no lid" award was that Arthur Andersen's intimate knowledge of the computerized accounting system would make the final costs lower. The idea was supposedly checked with verbal bids from other firms which were "higher than Arthur Andersen's proposal because the other companies had less knowledge about the computerized acounting system developed hy that firm," according to water department officials.

However, Perry Koslowski, president of Detroit's Senior Accountants, Analysts and Appraisers Association — a union composed of some 200 city government employees — had some questions about the matter, and in the end, competitive bidding was reinstated.

As it turned out, Coopers & Lybrand offered a bid of $695,000, which was lower than the original $906,000 offered by Arthur Andersen or whatever modified bid it may have offered during the bidding process. So, Coopers & Lybrand got the job.

A common strand between the school board and the water department matters, mentioned in the press, was City Finance Director Dennis O. Green, a former Arthur Andersen employee. It appears he recommended Arthur Andersen for various jobs.

In March 1977, the Green connections highlighted the news; at this time, the school board and the water department matters were general knowledge. In particular, Green's connection with the new Detroit auditor-general, one of his — not Arthur Andersen's — ex-employees was mentioned.

Marie D. Farrell-Donaldson, a certified public accountant, was appointed to the post of city auditor-general by the city council in March 1975. At that time, she was in her 20s. With the job situation so tight, this seems to have meant quite a jump in position for her.

Three years earlier, Farrell-Donaldson had worked for Green "only for eight or nine days in 1972 before taking a job as a junior accountant in the Model Neighhorhoods Program, according to a report in the *Detroit Free Press* [Feb. 20, 1977].

In March 1977, as auditor-general, she was asked to submit a report to the city council ahout the biggest Arthur Andersen project, the City Financial Information and Control System (Fics). This project had earned the consultants from Arthur Andersen some $1,772,600 in fees from May 1974 to June 1977.

Breached the Contract

The auditor-general did present a report, but it failed to mention her staff's findings that the consultants had breached its contracts.

A copy of the suppressed draft report came into the possession of the press. It contained statements like "User departments stated that they were not contacted during the system design and that Fics reports have not been useful." It also charged noncompliance with the contracts.

But in the report to the city council, Farrell-Donaldson blamed the admitted lack of success with Fics on city departments' unwillingness to change. She claimed that vague contract terms made it very expensive to determine noncompliance.

Failing to send the contract to the city law department, she allegedly threatened the senior accountants with disciplinary action. The senior accountants, in turn, claimed she was keeping important information from the public..

All this did no good for the general integrity of the audit process. But at that time, nothing much came of it.

Now, however, the situation is clearing, and it is easier to look at the source of conflict, the Arthur Andersen Fics system for Detroit. But that will have to wait for another week.

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For Honeywell Users

'IDS/I' Gains Data Dictionary Option

By Don Leavitt
CW Staff

PHOENIX — Honeywell, Inc. has introduced an optional data dictionary package for use with its integrated Data Store/I (IDS/I) data base management system (DBMS) on large-scale Series 6000 and Level 66 mainframes.

The IDS/I-Data Dictionary (IDS/I-DD) provides the user with the means of implementing a customized facility for the definition, integration, management and control of the data elements that affect a data base system, a Honeywell spokesman said.

Beyond the support it directly provides IDS/I users, the dictionary package is significant because it indicates Honeywell intends to continue supporting users working with systems they like even if the vendor has — as with IDS/I — introduced new systems which it feels offer more and better capabilities, the spokesman added.

IDS/I was the first DBMS offered by Honeywell — perhaps, indeed, the first offered as a commercial product from any vendor.

IDS/I-DD is said to feature exception reporting and privilege deletions through password protection. The data dictionary system consists of routines that analyze Cobol or Honeywell's unique Index Sequential Processing (ISP) and Transaction-Driven Systems (TDS) source programs.

The dictionary support includes data element reporting, dictionary indexes, record creation, "where used" reports, IDS/I chain definitions, on-line maintenance through TDS and normal maintenance reporting, the spokesman continued.

The analysis support determines what data elements a source program is accessing and how each element is being utilized within the program, he said.

Within IDS/I, the dictionary can be used both for data analysis — to determine the fundamental structure of data — and for functional analysis, to determine the way in which events and functions use the data.

It can be used during the design phase of a data base or conventional file development project as well as in the storage structure design phase, where it is used as a tool for the refinement of the initial design as it is actually implemented on the physical storage media, the spokesman said.

Significant Features

IDS/I-DD can also support the running of application programs, the collection and evaluation of performance, statistics, the performance-oriented tuning of the data base and the restructuring that is almost inevitably part of a data base operation as the user needs change, according to the spokesman.

In particular, the dictionary is said to support the creation of keyword, title and Cobol mnemonic indexes; the creation of dictionary reports and record definitions; and the resequencing of data elements, if required.

Honeywell's IDS/I-DD requires 48K words or 192K bytes of memory for its implementation. The package, excluding training and support, costs $14,500 and is expected to be available before the end of this year.

Ten Steps Offered

Consistency Urged in Software Selection

By Tim Scannell
CW Staff

CHICAGO — Consistency may be "the hobgoblin of little minds," but it is probably the most effective approach a DP manager or executive can take in selecting software, according to a recent speech here.

Without a structured and defined evaluation procedure, a manager will constantly be in the position "of having to defend every recommendation he is called upon to make," Gregory Walsh, assistant vice-president of the New Jersey-based Colonial Life Insurance Co., said. "And this task can only become more complex as the industry grows."

Participating earlier this month in a software products panel at the Information Management Exposition & Conference (Info '78) here, Walsh presented 10 steps that managers or executives might find useful when dealing with software vendors.

First, Walsh stated, the manager should regard his particular situation as totally unique. Other users' software should be investigated only for reference and not for duplication: "What is going to work for the fellow down the street who has the same equipment will probably not work for you."

Second, the user should determine his requirements and thoroughly explore the problems to be solved. Although this sounds simple, it is probably the most important step because all future decisions and the final package selection will be based on the user's knowledge of the original problem, Walsh pointed out.

Possible Solutions

Third, the manager should determine the possible solutions and compare them to what's offered by the software vendors and user groups. Buyers' guides, trade publications, sales presentations, industry consultants and other users can all provide input on the "basic features" and "bells and whistles" of the products under consideration.

The fourth step is to prepare a list of specifications and requirements desired in the software system. The list's composition should involve as many people as possible and the requirements should be compiled in "ranked order of importance."

Including the opinions of several people in the list not only offers different points of view, Walsh noted, but also "cuts down any resentment that might exist between [the manager] and the users of the product."

The next step involves developing a detailed evaluation plan. The manager has to determine which factors are most important to his installation, whether they consist of machine runtimes or information reported or developed by the package, Walsh said.

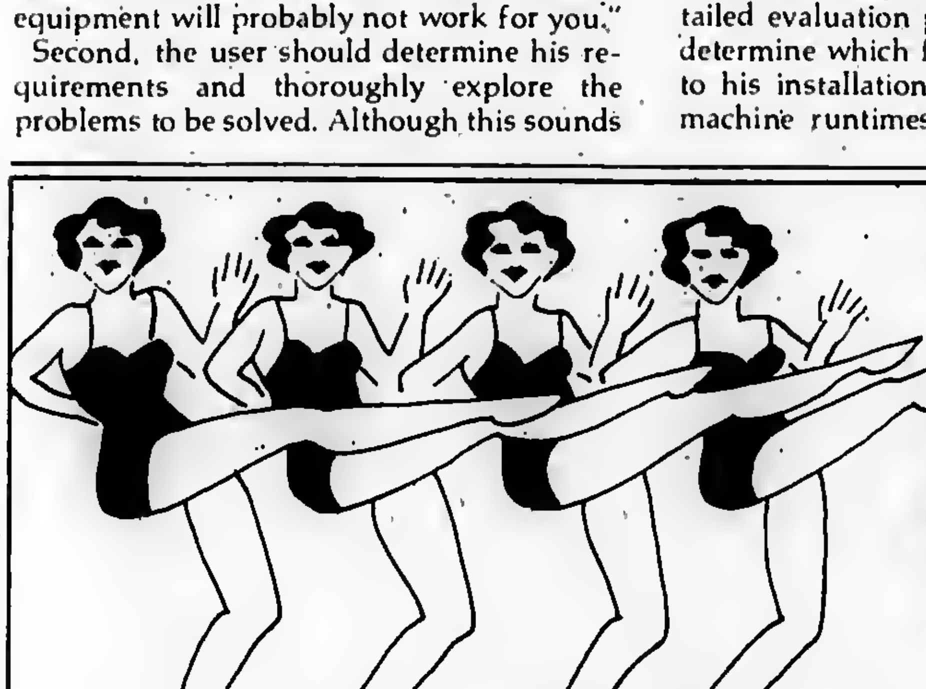
Sixth, the user must match all of the information gathered during the preselection process and compare it with the specifications offered by each of the package vendors. Those products that do not meet the manager's requirements can be eliminated and the best ones put aside for further examination.

Next, the user should personally interview each of the vendor finalists, keeping in mind all of the original requirements. "If you go to a demonstration, the vendor will show you a product that works," Walsh noted, so the user should not be swayed by first impressions.

The eighth step involves calling several companies on the user list, even though the list may be slanted in favor of the vendor. The potential user should have a series of questions ready to ask the present user.

Ninth, the manager should select two or three vendors for final consideration and bring in their respective systems for an in-house trial. Employees can benefit from vendor-supplied system education while the vendor "works for his sale," Walsh said.

The potential user should consider the price of the total hardware/software system last. The original objective was to find the best solution — not the cheapest.



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DP Director Maintains 'Programming Not Art'

By Tim Scannell
CW Staff

CHICAGO — The coded objets d'art of even the best programmers will, unfortunately, never be displayed alongside the masterpieces of Cezanne, Modigliani or Monet. Programming, from a manager's point of view, is a measurable labor and therefore subject to production and completion schedules.

"Programming is not an art ... and if you're not measuring productivity, then you're not producing," according to Walter Czerniak, DP director of Chicago-based Phoenix-Hecht, Inc.

Czerniak chaired a panel on productivity in software development at the recent Information Management Exposition & Conference (Info '78) here. The panel discussed and fielded questions on such topics as schedules, project development and cost-effective productivity techniques.

'Benchchecking' Urged

The programming manager — like the manager of any other department — must set certain measures or goals for the people on his staff, Czerniak stated. These measures could be lines of usable code, the number of completed projects or even a program's "dollar return to the company," he explained.

Before a programmer's production time can be measured, however, the manager must examine how much time the programmer spends "not writing code." Vacations, administrative duties, meetings, research periods and time spent discussing problems with the operations staff and waiting for program printouts all detract from the actual time a programmer spends coding a program.

In fact, Czerniak said, the normal 40-hour work week shrinks to about three and a half days when all of these "distractions" are considered.

The manager "has to know exactly how much is necessary, then proceed to eliminate wasted time."

Czerniak suggested "benchchecking" a programmer's work in much the same way that a machine is tested before it is presented to the user. Keypunch errors and "deliberately" sloppy programming should be eliminated before a program, rather than having the computer point out the errors and then rewriting corrections.

"The more time you spend up front, the less it will cost in the long run," Czerniak noted.

Productivity assessment begins with an examination of three key areas, Czerniak said. First, the manager has to be aware of the knowledge level of each member of the programming staff. This knowledge includes the amount of formal education, work experience, familiarity with the machine and ability to "do things faster," he stated.

Second, the number of tools available to the programmer is an important consideration for an accurate productivity evaluation. The type of computer equipment, whether it operates in batch or on-line mode, the data entry methods and compiler design all have a direct effect on a programmer's cost-effectiveness and speed, Czerniak indicated.

Finally, the type of controls specified by the manager and the assessment method used is significant to the rating process. How well a supervisor manages a group and whether a manager rates programmers according to their effectiveness or speed will influence the productivity rate.

Most importantly, Czerniak added, a manager should "be less concerned with equipment ... and give his own people the same aids and assistance given to the system's users."

'Credibility Gap'

Fellow panelist Frank Van Husen, group manager of Chicago's Shield Enterprises, Inc., stressed "common sense" software expectations.

"More projects have been devastated and destroyed by wishful thinking and poor planning than by anything else," Van Husen declared.

Van Husen focused his speech on the "credibility gap" that exists between a software vendor's initial promises — unrealistic installation times and capability claims — and the reality of the delivered product. First hardware/software communions, he said, invariably feature poor reliability and a variety of excess user tailoring; they are never installed according to predetermined deadlines.

Managers should set priorities rather than deadlines and seek to identify variables that might affect the final results, Van Husen stated.

The panelist also warned his audience not to assume a "perfect world" and to allow for "illnesses, lunches and going-away parties for other employees." Responsibilities should be spread out among several employees rather than just one, he cautioned, alluding to the more than 30% turnover rate in the DP industry.

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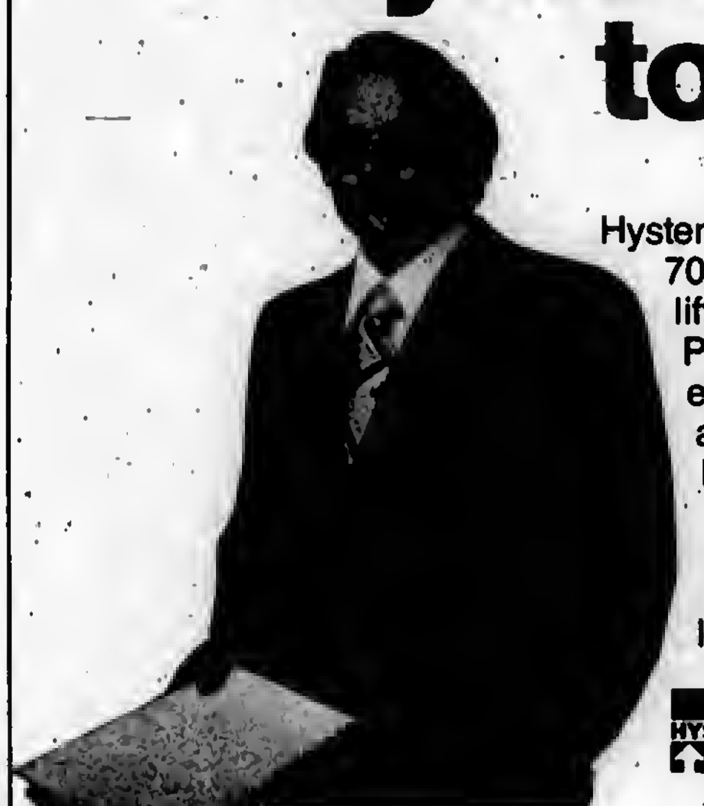

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Unite End User, System

High-Level Language: Revolution After DBMS

By Charles Ziering
Special to CW

The concept of data base management represents a major advance in the field of software systems development. While debates continue over the best underlying data model (Codasyl or network, relational and so on), the central thesis of the data base approach remains unquestioned.

A much more significant and less publicized breakthrough, however, comes with the advent of high-level, nonprocedural languages that operate on top of data base management systems (DBMS). Although data base management can yield significant percentage improvements in system development and maintenance time, improvement resulting from the use of higher level languages must usually be measured in orders of magnitude!

At a recent comparative data base symposium in New York, vendors were given a chance to present their data base system offerings. In the course of their product descriptions, it soon became clear that much of their comparison criteria were superfluous. One group, for example, boasted its data manipulative language was implemented in host language (e.g.. Cobol) verbs. The other group championed its use of call statements.

The relative impact of these two approaches on the manpower required to develop a system, if measurable at all, is negligible.

Data Basics

Further, as hardware costs decline, most traditional comparison points become increasingly insignificant, especially in view of the dramatic increase in productivity achieved through higher level languages.

The experience of Mitrol, Inc. with the application of its Mitrol Industrial Management System (Mims) provides compelling evidence of these benefits. Mims is a high-level, nonprocedural request language that directs a network model data base manager. In addition to general report writing and transaction processing capability, Mims provides special manufacturing-specific functions.

The approach is quite different from that of the canned, menu-style systems normally offered for manufacturing applications.

Rather than selecting options from a predefined list of available functions, a customized application of the system is developed. One first defines the data base structure and the items of information to be recorded through an English-like data definition language. Then the request language is employed to custom-define all transactions, reports and queries.

Note that this is not simply a query language, but one that can handle all aspects of data base use. The power and flexibility of this language obviates the need for programming in all but isolated cases.

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Of all our customers, only a third have found the need to resort to any traditional programming, typically for one or two transactions or reports out of 150. Thus, by eliminating virtually all of the traditional programming required, development and maintenance can be cut by orders of magnitude.

The experience of a large housewares manufacturer dramatically affirms this claim. Having worked extensively to specify the requirements for its proposed manufacturing system, the company projected it would take six man-years over 2-1/2 to three elapsed years to implement the system in a conventional programming language.

Four of our analysts accomplished the feat in six weeks, actually spending much of the time debugging the specifications. That represents a factor of 13 reduction in man-time and a 26-fold reduction in delivery time.

Perhaps more interesting, as a result of real experience working with the system, improvements and extensions effected changes to 70% of the reports and transactions during its first year of operation. That degree of change in a traditionally implemented system requires tremendous resources.

It is significant to note that data base management was an important prerequisite to the development of nonprocedural languages. Languages must be built on some framework of world knowledge or model of the data under consideration. To many, unfortunately, data base management seems to represent a record processing expedient. It can take on much added significance, however, when viewed as a mapping of real world associations.

As such, the data base can provide the information model required to support the structural framework needs of a language. Thus, it is not necessary to define a new language for each application.

High-level, nonprocedural languages provide benefits far beyond reductions in development and maintenance time. These languages also help reduce computer system alienation by bringing the system closer to the end user.

Ziering is a systems consultant for Mitrol, Inc. in Lexington, Mass.

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Not From Users, But From DP

Resistance to 'DA' Coming From Strange Place

By Robert Chamberlain
Special to CW

For many years, those of us who take data base seriously as a device for representation of real business activities — instead of as a file management frill — have treated data base administration as very central to a true integrated data base system.

For an equal number of years, it seems, installations have been determinedly ignoring it or paying lip service by giving the person who designs the data base file the title of data base administrator (DBA). If, however, the DBA ever attempted to administer anything, he could expect to have his design pencil broken and be sent back to the programmer pool.

An attempt is being made at present to step around this lessening of the DBA's responsibility by creating a distinction between "data administrator" and "data base administrator." This would allow the file designer to retain his classy title while reporting to a new position, the data administrator (DA). The DA would carry the authority originally intended for the DBA.

Data Basics

The DBA would be a member of the data administration staff; the DA, by virtue of staff and responsibility, would have a position of significant stature. The question of the exact proper placement is political and would vary from organization to organization.

The DA would then lead the internal determination of the following data issues:

- Data dictionary scope.
- Data applicability vis-a-vis user requirements.
- Data base design/redesign.
- Supervision of conventional file structure.
- Performance measurement supervision.
- Future configuration analysis.

These data issues reflect no new developments or claims for originality or inclusiveness.

Serious Resistance

Rather than reexamining the list's contents, let's find where the most serious resistance to the DA approach is found. It is not, by growing observation, in the user area but rather in the DP group.

The real reasons for this resistance are not being candidly stated now. The typical reasons being given are that "The idea is not real world" or "It can't be done here." Let's look at these in a little more depth.

The phrase "real world" connotes a tough performance-oriented, shirt-sleeves management type of approach. It also indicates a predisposition to pragmatic, successful implementation.

Current implementations of low-level DBAs are notable in their use of the DBA as only a technical consultant. The resulting creation of a multitude of mini data bases consisting of converted conventional files cannot be termed implementation success.

Since this does not meet the test for pragmatism, "real world" must mean something else.

Used as a code phrase meaning "anti-academic," it implies the rejection of impossible "theoretical" standards. In this case, the radical academic notions which are being rejected include control, definition and centralized accountability — concepts to which performance-oriented management should be cordial.

Brave But Outgunned

Something else must be at work, then, which is more challenging to DP management. Examining "It can't be done here" may be helpful.

At first blush, this implies a brave but hopelessly outgunned DP department frustrated by user or upper management intransigence. An attractive picture to DPers, but quite at odds with reality.

Looking at the changing DP environment, we can see a combination of vastly increased computing power and sophistication (witness the tremendous advance of the microcomputer, the superchips, etc.), combined with an increasing user awareness of technological capability; the office of the future will reflect this changing structure.

Firms which work with large and medium-size organizations are currently constructing increasing numbers of multifunctional teams which simultaneously work with users and DP.

Interfaces with an increasingly large number of users have shown their rapidly growing awareness of data administration principles. Furthermore, it should also be an open signal to DP that these users do not couch their awareness in terms like "too theoretical" or "DBA's task is data base file design."

And if that is not a sufficient signal, the fact that users are comfortable with concepts like nonmechanized data elements in the data dictionary and DA review and supervision of conventional file contents should sound a real alarm bell to DP reactionaries.

Issue of Property

It is against this background that we can determine the real source of the resistance to the data administration concept. It is simply that DP is resisting the idea of data being a corporate resource rather than DP's property.

The more blurred the distinctions become between DP and non-DP work (e.g., in the area of distributed processing), the more determined the foot dragging regarding data administration becomes in some DP departments. Why? Because of a fear of the unmentionable: that the DA may be a non-DP type.

Rather than seeing this as an opportunity for expansion of its influence (perhaps by gaining a DP DA over non-DP staff), DP has chosen to gather its wagons into the proverbial circle with the so-called DBA wandering inside, measuring data base accesses. "It can't be done here" has become "It won't be done here."

Let's hope more changes in nomenclature won't be necessary to overcome this current DP resistance and put real DAs into positions of influence. I, for one, would rather not have to start advocating a "chief data officer."

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See Page 3
(MAIN SECTION)

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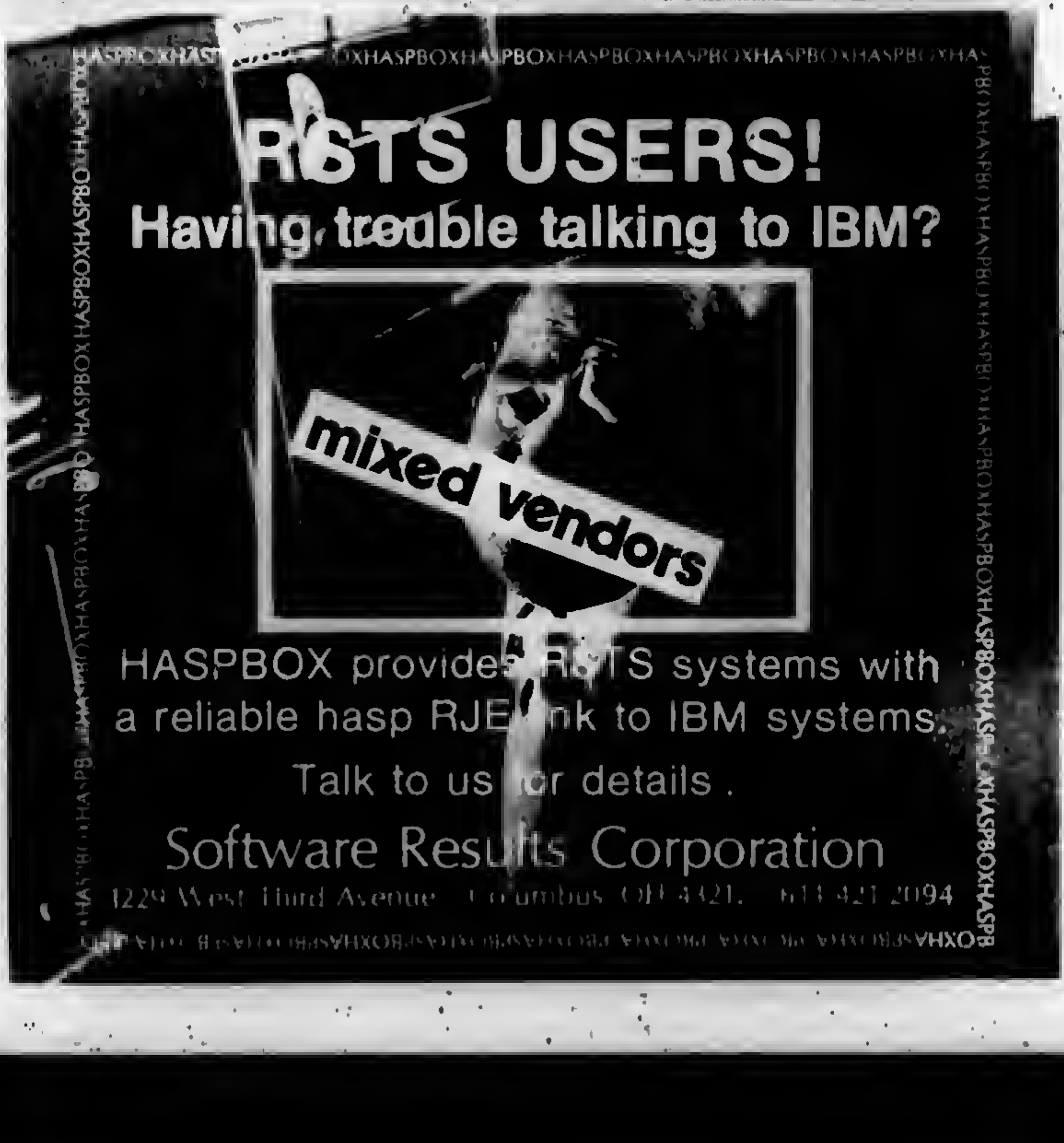

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With T/S, DBMS No Longer Just for Big Users

By Robert C. Pinto
Special to CW

Data base management systems. Even today, that term still evokes many erroneous images.

Many people, for example, believe a data base management system (DBMS) is a quite expensive piece of software that only large organizations with their own computers and massive quantities of data to process can afford to use.

The reality is quite the opposite. To be sure, many giants in both the governmental and corporate worlds rely on DBMS. It is equally true, however, that many small enterprises with DP budgets as small as $1,000 to $2,000 a month are making quite effective use of DBMS.

How? The answer, as you may have guessed, is through the use of time-sharing services purchased through commercial service bureaus.

Data Basics

Today, almost all remote-computing service (RCS) vendors offer a complete line of data base management products: They are able to do so mainly through licensing agreements they have with both minor and major software producers.

Considering the communication networks offered by these RCS vendors, DBMS are available by a local call from an estimated 95% of all the telephones in the world. Amost any organization of any kind can thus, on a fee basis, access one of the DBMS on the market.

More and more organizations of all kinds, from the smallest to the largest, are learning that DBMS services purchased through a service bureau are the answer to their DP needs. Even organizations with in-house computers often use such services for special purposes, such as prototyping an application before moving it in-house.

Users who rely entirely on remote time-sharing services, however, differ significantly from large users with their own in-house computers. The small user is, in almost all ways, a different breed.

First of all, the user who relies entirely on RCS usually is little concerned with such performance measurements as I/O rates, throughput or storage requirements. All he is really concerned with is how effectively the DBMS can satisfy his problems at hand, whatever those problems may be. His evaluation criteria are generally reduced, via various formulas, to costs and dollar savings.

The RCS user differs significantly from the in-house user, too, with regard to how he defines "small," "medium" and "large" data bases. For the RCS user, a "small" data base is one that is less than 1M characters. The range for a "medium" data base is from 2M to 10M characters; a "large" data base ranges from 10M to 50M characters.

Another significant difference concerns costs. In the RCS market, the monthly dollar outlay for data management processing averages between $2,000 and $5,000. For in-house installation, in contrast, monthly costs are generally $15,000 or more.

Satisfactory Results

For his relatively small expenditure, however, the RCS user generally gets just the kind of services he most desires. The main reason is that his objective is typically to obtain very specific results on a relatively short-term basis.

Generally, too, the RCS user designs each given data base for a single-purpose application that will be used by relatively few individuals. It is rare that the RCS user uses a data base for multipurpose applications.

The specific applications may cover a wide range, but quite often they are of an inventory nature. The word "inventory," however, must be used somewhat loosely rather than in a strict accounting sense.

Typically, inventory-like data bases are used to keep track of quite specialized resources, such as engineering or architectural drawings, outstanding loan commitments or vehicles in a motor pool.

Quite often, RCS users, including many large organizations with their own in-house computers, buy data management services for the purpose of prototyping applications or individual features of applications. They find it easier, quicker and cheaper to make trial use of applications before fully developing and installing them.

Many other kinds of firms, however, use RCS data management services for project control. Included among them are scientific research organizations, research and marketing firms, hospitals, architectural concerns and even theatrical companies.

Pinto is with MRI Systems Corp. in Austin, Texas.

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NAC Report Concludes

Packet Switching Best for Voice, Data

By Ronald A. Frank
CW Staff

GREAT NECK, N.Y. — Packet switching is the most effective technique for implementing a voice/data communications system, according to a study completed by Network Analysis Corp. (NAC).

Although the study was undertaken for the Department of Defense to analyze its future needs, the NAC report stated that the conclusions "relate to large users who lease tariffed lines and lease or purchase hardware."

In determining that packet switching is the most efficient method for transmitting voice and data, the study also found that the conclusion remained the same for an integrated voice/data network or for separate voice and data nets.

The study examined packet switching, circuit switching and hybrid (circuit/packet) switching techniques. Each technology was studied in respect to the handling of both voice and data traffic.

It was assumed that digitized voice would be transmitted over packet-switched networks. Using vocoders to digitize speech information, it was found that even at 2,400 bit/sec, traditional circuit-switching network costs were higher than those for packet-switched nets using 64 bit/sec digitizers. Low-bit-rate voice digitization systems may include speech quality degradation and may not be acceptable for certain user environments, the report noted.

Packet-switching technology was found to be superior over the range from 2,400- to 64 bit/sec voice digitization rates.

The study findings are considered significant because previously it had been generally assumed that circuit-switched facilities such as those provided for private lines were best for voice applications, while packet-switched facilities were best for data. The findings imply that users who implement packet networks can optimize their communications efficiency and costs by handling both voice and data with packet technology. Additional research into the operational benefits of packet networks is anticipated, an NAC spokesman said.

The study found that segregated voice and data nets result "in only slight cost increases over an integrated voice and data network for all network technologies considered. Further, segregated packet nets for voice and data cost less than integrated systems using either hybrid or circuit-switched technologies," the report said.

(Continued on Page 34)

Public Networks Still Safer For Many Users, Experts Say

By Brad Schultz
CW Staff

CHICAGO — Although soaring public net rates and uncertainties about federal regulation of communications are moving many large corporations to consider establishing their own private networks, experts warned here last week that public tie-ins remain the best choice for many users.

The advantages of a public network include immediate availability of the services, widespread geographic coverage, no entailed capital investment, high component reliability, equitability of cost based on use and easily accommodated expansion. In addition, maintenance burdens are placed on the carrier's shoulders, Howard Anderson, president of the Yankee Group, said at the Information Management Exposition & Conference (Info '78).

Addressing a session on "Information Systems Planning for the 1980 Corporate Environment," Anderson predicted AT&T's proposed Advanced Communications Service (ACS) will obviate the need a number of the largest U.S. manufacturers now have for multiple network services. He noted that General Motors Corp. has 29 networks and Ford Motor Co. has six nets "out of the same building."

Just deciding whether and how to implement a private-line net can cost up to $1 million and drag on from four to 18 months, according to Michael D. Sims, Consolidated Rail Corp. assistant vice-president for systems.

The benefits of the private-line alternative were said to include "economy of scale," cost stabilization, enhanced productivity and service or control of the user's own products.

To decide whether such service would be

(Continued on Page 34)

Computer Optics Adds Line Printers, Cuts Prices Across the Board

BETHEL, Conn. — Computer Optics, Inc. has announced two line printers for its IBM 3270-compatible CRT systems and across-the-board price reductions.

The 8150 is a 150 line/min matrix line printer that includes a 96-char. Ascii set rated for 132 print positions.

The second printer, the 8130, offers the features of the 8150 with a 96-char. Ascii set but is twice as fast with speeds to 300 line/min at the same rated 132 print positions. Both the 8150 and the 8130 print up to six copies with no ghosting, smearing or imprinting.

The printers can operate in receive-only mode using IBM 2780 and 3780 protocol.

The 8130 is available with a one-year lease for $540/mo or a two-year lease for $405/mo and the unit can be purchased for $13,250. Deliveries of the 8130 are scheduled for 120 days. The 8150 costs $365/mo on a one-year lease, $275/mo on a two-year lease and $10,700 to purchase.

Price reductions of as much as 30% were announced on other Computer Optics products, including remote and local CRT systems.

A typical IBM 3270 system with local controller, 10 displays and two printers costs $65,125, while a similar Computer Optics system using the 8150 printer can be purchased for $43,480. Similar savings occur on a two-year lease program. The IBM system is available at $1,529/mo, compared with Computer Optics' system rental of $1,233/mo, the company said.

Computer Optics, Inc. is at Berkshire Industrial Park, Bethel, Conn. 06801.

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Scanner Added to National Semi System

SANTA CLARA, Calif. — If the checkout clerk at a supermarket counter can see the Universal Product Code (UPC) printed on a box or can, then the National Semiconductor Corp. Bar Double-X (BDX) point-of-sale (POS) scanner can read the code without the article being tipped in its direction, according to the vendor.

Part of National Semi's Datachecker POS system, the BDX unit reportedly eliminates three problems encountered with other UPC scanners: the need to fit the product carefully to the scanner; poor recognition arising from nonstandard package shapes or dimensions or labels of marginal quality, and the dependence of checkstand design on the physical dimensions of the scanner and related terminal components.

In spite of these common problems, UPC scanning yields savings from enhanced productivity, reduction of shrinkage and improved data collection, the vendor stated.

The "front read" range of the BDX is 180 degrees and the "bottom read" range is 360 degrees, reportedly allowing the unit to scan a product with the code label facing the checker — even if the label is held upside down. This results in less checker fatigue and more one-pass scans, the firm noted.

The BDX can read code labels printed on plastic, cellophane and wax-coated containers more accurately than conventional POS scanners do, the vendor continued. Unique features of the unit's decoding logic are said to include a beam speed fast enough to read every label many times and a constraint that two consecutive readings must agree before the logic will decode the symbol and apply the check digit algorithm.

As a result, poorly printed symbols and symbols on reflective packages are read correctly at a much higher rate than for any other scanner system, with productivity improving proportionately, National Semi claimed.

The scanner can fit into an over-the-counter checkstand and still permit the cart to pass underneath.

The BDX with interface to the Datachecker system costs $3,745 with quantity discounts available. National Semi is at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Packet Switching Seen Best Technique

(Continued from Page 33)

According to the study, traditional circuit switching has poor price/performance characteristics for interactive data applications because channel capacity is dedicated to users during idle periods. This method is poor for voice applications because it does not detect and eliminate periods of silence during speech.

It was recognized that a transition period may be required for users to phase from traditional circuit to all packet technologies. It was noted that during this transitional period, hybrid systems incorporating both technologies would be suitable.

The study said that packet technology would be suitable for varied levels of access and transport priorities while in a circuit switched environment, facilities must be dedicated to high-priority customers. During high load conditions, this would result in low priority preempted users placing an additional burden on the network with redialing attempts.

Using standard tariff rates in effect on AT&T's Dataphone Digital Service (DDS), the study found that packet switching will remain superior even if switching or transmission costs "decrease by a factor of 10."

Copies of the study are available from the Defense Documentation Center, Washington, D.C. The study is titled "Economic Analysis of Integrated DOD Voice and Data Networks," Arpa Order No. 2286, Contract No. DAHC 15-73-C-0135.

Public Nets Safer for Many

(Continued from Page 33)

appropriate, a company must conduct an economic evaluation, a technical evaluation and a trade-off analysis, Sims said.

The economic study must consider both the firm's prospects and those of the general economy; the technical appraisal must examine the state of the art and speculate on how it will change many years into the future; and the trade-off analysis must carefully weigh the pros and cons in light of the firm's priorities and objectives.

Reasons for Popularity

Anderson has attributed the popularity of private nets to plummeting transmission costs. According to a Yankee Group report just completed, the cost of transmitting one million bits declined from $10 in 1962 to $1 in 1968 and will drop to a projected ten cents in 1980. This drop was described as having moved "savvy communications managers" in the private-line direction.

"Commercial users began to put multidrop facilities, concentrators or multiplexers at the ends of their lines — to build networks dedicated to specific applications," the report said. "It was the decrease in communications and switching costs [that] allowed for many private networks in the first place."

However, "in Europe, from the beginning, the [postal, telephone and telegraph authorities (PTTS)] felt that private networks were not the answer," the report continued. "The PTTS themselves installed a public network — it was there if you needed it . . . [and] conserved the need for capital because it was shared.

"Not the least of the advantages was the redundancy built in because of dual nodal processors and lines — a redundancy that essentially no commercial firm could cost justify," it said.

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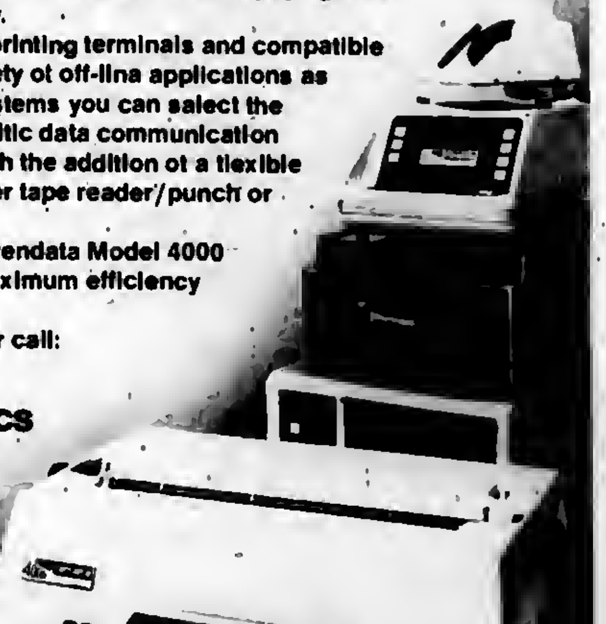

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Fiber Optic Link in Works For Alberta Phone System

MELBOURNE, Fla. — Harris Corp., has released details of the T4 trunking system it claims will be the longest fiber optic link of its type when completed for Alberta (Canada) Government Telephone.

Harris is constructing the 50-kilometer link between southwestern Alberta sites in Calgary and Cheadle.

The fiber optics hardware was designed to be physically compatible with existing telephone-type equipment, according to J. Richard Jones of Harris Fiber Optics Systems Engineering.

Designed to have minimum impact on maintenance and training procedures, the optical fiber trunking hardware will be nearly identical to existing equipment insofar as appearance, installation, operation and maintenance are concerned, he said.

At the Electro-Optics Laser Conference in Boston last month, Jones reported that considerable theoretical and experimental effort was involved in selecting the best system configuration for the project.

A sophisticated computer simulation technique was used to study the tradeoffs between cable parameters and repeater parameters, Jones said, and a parallel effort involved evaluation of existing Harris equipment in field environments. This included the repeater and terminal transmitter and receiver modules used in multiple service operator trunks and other high-speed systems.

In addition, a field trial was performed to confirm that optical fiber cables could be installed with conventional field plowing procedures.

Jones observed that use of a microprocessor-based system controller improves the reliability and maintainability of the T4 trunk. The controller automatically monitors the in-service performance of working and protection lines, he noted, causing the link to switch traffic to a protection line in the event of failure.

After this switch is made, an automatic fault isolation procedure is executed in which the repeater sections of the failed line are sequentially tested to locate the failed repeater or terminal module, he added.

Lower Cost Stressed

Jones stressed that fiber optics can be significantly lower in cost than conventional technology — especially at the higher T3 and T4 capacities.

Cost per circuit-mile of fiber optic cable diminishes sharply at the T3/672-voice and T4/4,032-voice circuit rates, he noted.

The full text of Jones' Electro-Optics Laser Conference address is available at no charge from William R. Fitzgerald, Harris Fiber Optics Systems, P.O. Box 37, Melbourne, Fla. 32901.

DMC Offers POS Terminal With Built-In Diagnostics

SANTA CLARA, Calif. — The microprocessor-based DMC 9301 transaction terminal from the DMC Division of Cetec Corp. features built-in diagnostics, a 10-key numeric pad, six programmable transaction keys and eight prompter/status indicators.

The point-of-sale (POS) terminal provides an alphanumeric display with 16 positions and allows scrolling through the receive buffer for as many characters as the user wishes to define, DMC states. Customization can entail protocol, operation code and field descriptors, prompter light designation and customized case and key colors.

The DMC 9301 was designed to operate on a variety of communications networks, the vendor said, noting that a starter package is provided to tailor the product to specific applications.

The starter package consists of all customized software as well as two Model 9301s for multiple terminal testing. Optional features include a magnetic card reader, personal identification number pad, internal modem, six line cut form printer and a cluster controller.

The optional features are said to allow the terminal to address virtually all POS applications.

Base unit cost for the DMC 9301 is $995 with quantity discounts available. The product is warranteed for one year, and nationwide toll-free central dispatch service for either depot or in-field maintenance is available, DMC said from 2300 Owen St., Santa Clara, Calif. 95051.

CRT Emulates Several Units

CHICAGO — A low-cost intelligent terminal for the OEM user that features firmware emulation of several vendors' terminals was unveiled by Infoton, Inc. at the Fifth International Information Management Exposition & Conference here recently.

The Infoton I-100 terminal contains a Z80 microprocessor and a number of programmable read-only memories (Prom). The Proms reportedly emulate the control code sets of Digital Equipment Corp. VT-52, Hazeltine Corp. 1400/1500, Lear Siegler, Inc. ADM-3A, Perkin-Elmer Corp. Fox and Applied Digital Data Systems, Inc. terminals.

The I-100 is said to provide computer control of keyboard scanning, screen formatting and editing, paging and line drawing with a 32-char. set. A 1,920-char. screen (80 char./line) offers a 25th line for status displays as well as a full 96-character Ascii set, switch-selectable transmission rates to 19.2K bit/sec, block mode transmission with protected/unprotected fields, up to eight programmable function keys and a 15-key numeric cluster, the vendor stated.

The I-100 costs $849. Infoton is at 520 Second Ave., Burlington, Mass. 01803

CRT Displays 132 Char./Line

CAMBRIDGE, Mass — The ECD Corp. Smart Ascii is billed as one of the few intelligent CRT terminals able to display full line printer format: up to 132 char./line.

The terminal can display up to 40 lines on its 15-in. CRT screen, representing a total of 4,096 characters

The standard font is the full upper and lower Ascii character set, but by employing the supplied font editor program, the user can reportedly design his own special characters. Further, the keyboard is "relegendable," meaning the user can "easily" match a new character set, and foreign language fonts can also be implemented, ECO said.

The Smart Ascii interface does not require any special protocol from the host CPU. The terminal communicates via an RS-232 line and "looks like a simple printer/-keyboard combination to the host," the firm said.

This characteristic allows for either direct hookup or remote use via dial-up lines with keyboard-selectable transmission rates in the 110- to 9,600 bit/sec range.

The Smart Ascii comes with a text editing program.

The terminal, including 37K bytes of memory, a 78-key keyboard and two mini-cassette drives costs $7,900 from ECD at 196 Broadway, Cambridge, Mass. 02139.

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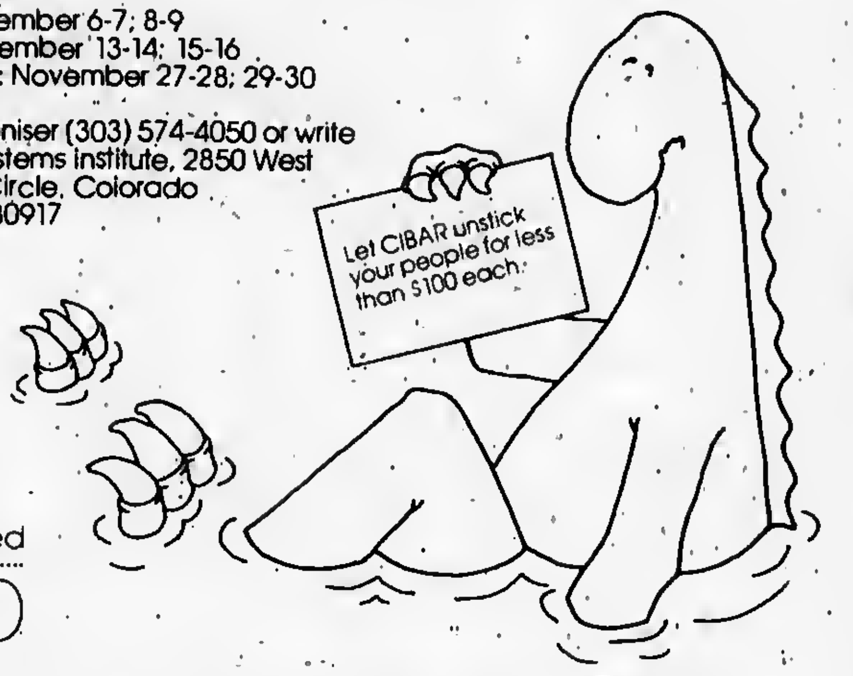
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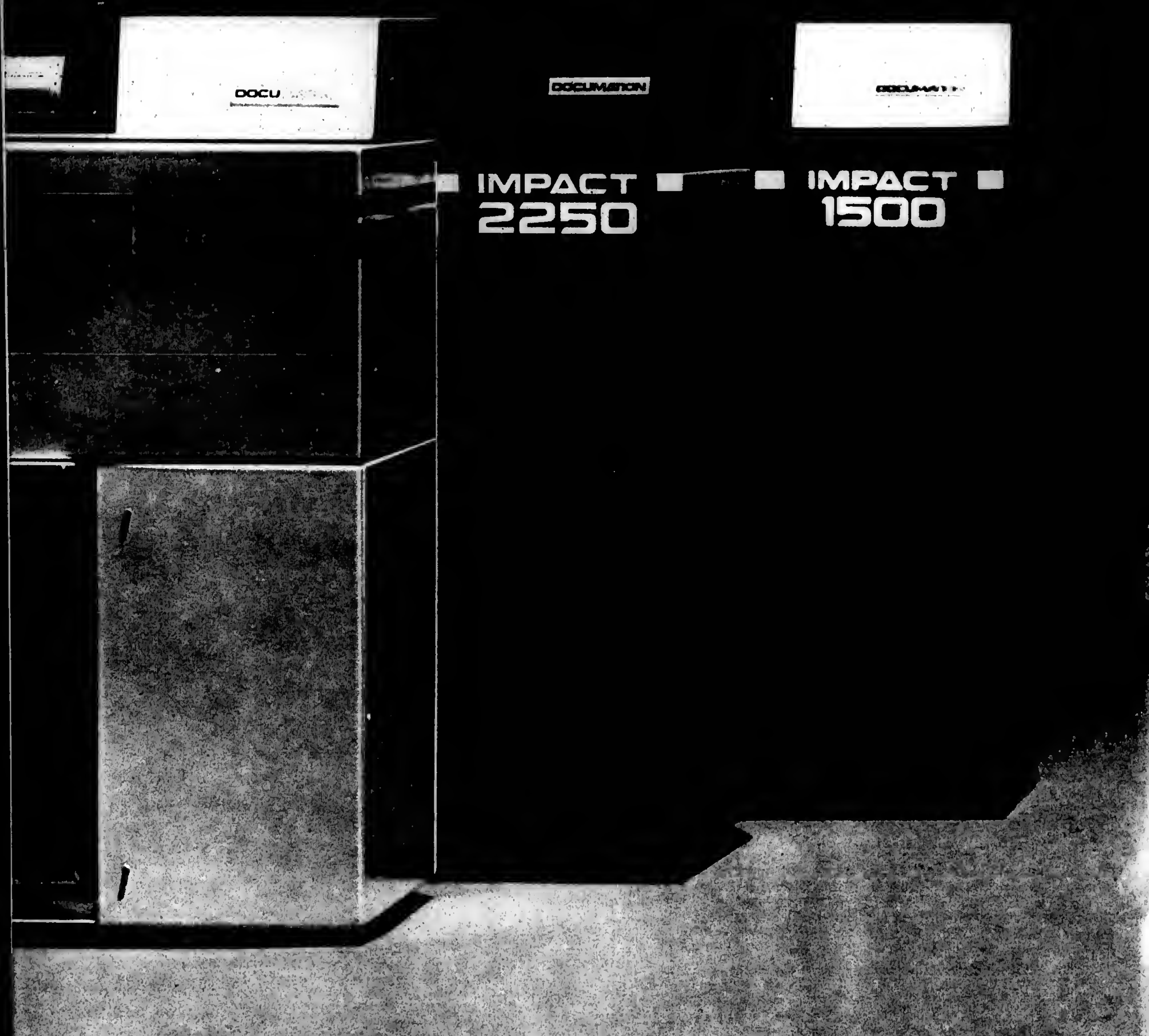

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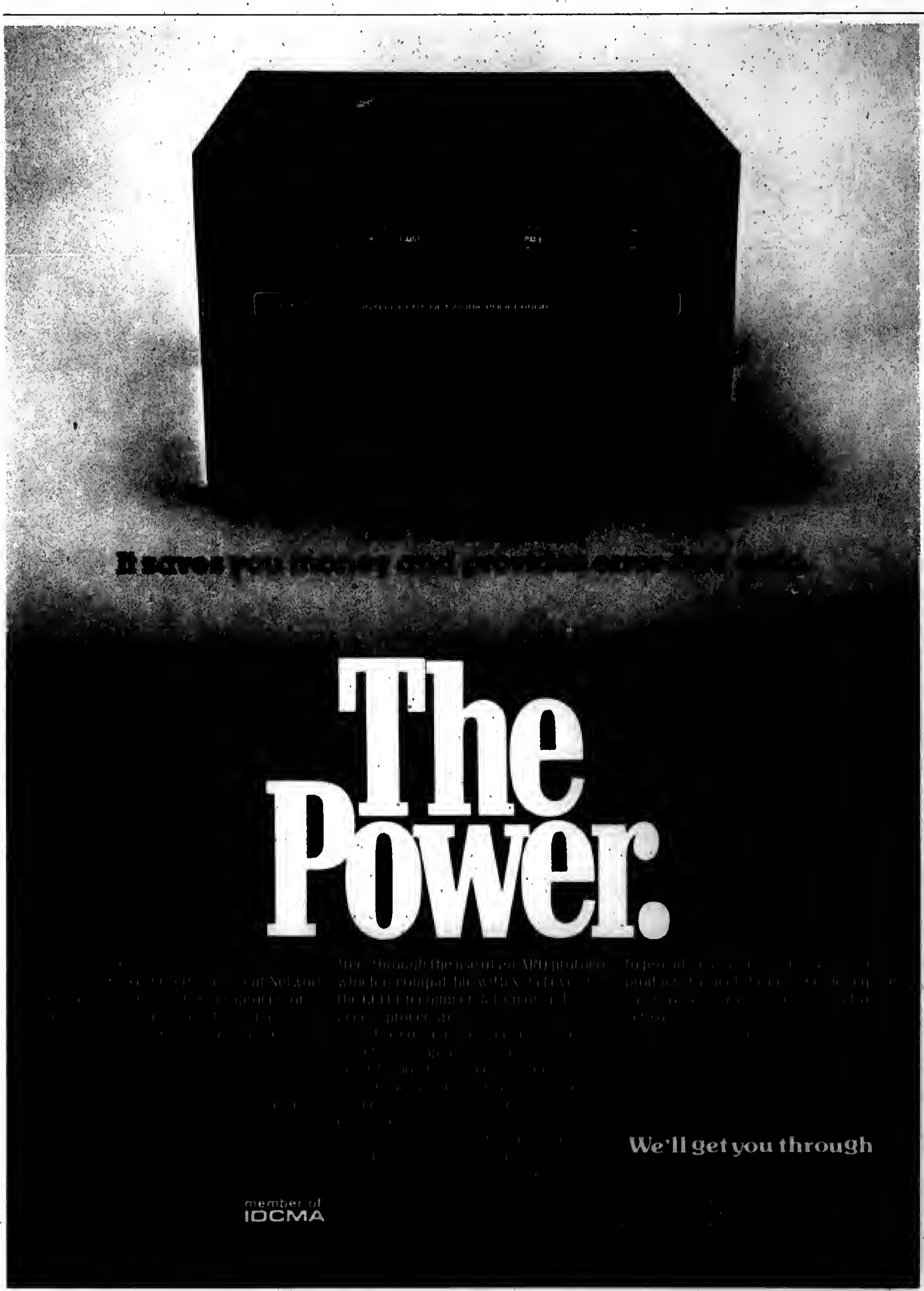
Infotron Adds Smart Modem

CHERRY HILL, N.J. — Infotron Systems Corp. has introduced a microprocessor-controlled, 9,600 bit/sec modem whose design reportedly permits it to withstand line transients lasting up to 2 sec without retraining.

The DL 9600 operates point-to-point in full-duplex mode on a four-wire Bell 3002-type private line at 4,800 - or 9,600 bit/sec, switch-selectable. All-digital filters eliminate the drift found on analog units and provide an error rate of less than 1 bit in 10^9 at 9,600 bit/sec on an unconditioned line, the vendor claimed.

The LSI unit, priced at $5,500, features optional dial backup and self-testing capabilities including digital or analog loopback of remote unattended units. The operator can perform both local and system diagnostics and can select all mark or all space transmission. The automatic equalization device features four front-panel switches and nine LED indicators, including one to signal when the telephone line is degrading.

Infotron is at Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.



Data 100 Users Gain IBM 3776 Emulation

MINNEAPOLIS — Data 100 Corp. has announced a software package that allows appropriately configured systems to emulate an IBM 3776 remote batch terminal with Binary Synchronous Control (BSC) line protocol.

The package can be used on any Data 100 remote batch terminal system equipped with a keyboard/CRT terminal, 4,800 bit/sec BSC communications and one system and one data diskette, according to a spokesman.

Optional peripheral equipment reportedly includes a second data diskette; interface compatibility with synchronous communications at a rate of up to 19.2k bit/sec; card punches; card readers operating in the 150 - to 1,000 char/sec range; and printers in the 125 - to 1,250 line/min range.

The data diskette can be used to read and write data to the communications line and other systems peripherals, Data 100 said.

Information received on the line can be defined in either printer, punch or diskette.

The system diskette can store and execute a number of communications functions, job procedures and data set tasks and display operator statistics, he added.

System messages are displayed in English on a full-screen CRT rather than as three-digit numerical readouts for operator interpretation.

The package is available immediately at no charge from Data 100 at 6110 Blue Circle Drive, Minneapolis, Minn. 55435.

Code Conversion Offered as Option For Terminal

CAMPBELL, Calif. — A code conversion option for the Data Terminals & Communications, Inc. (DTC) Model 382 provides operator switch-selection of Ascii, BCD or correspondence line codes.

The firm said the option introduces the following features:

- IBM 2741 emulation in BCD or correspondence codes.
- Data transmission rates from 110-to 9,600 bit/sec in all codes.
- Line turnaround buffer (type ahead).
- Automatic log-in in the end-of-address.
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- Normal Ascii operation.

The option costs $200, DTC said from 590 Division St., Campbell, Calif. 95008.

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Easier for Student Operators

College Goes Diskette, Saves $10,000

By Roy James Parrish Jr.
Special to CW

DANVILLE, Va. — Danville Community College (DCC) has implemented a cardless computing environment for its instructional programs through the use of key-to-diskette units. While the use of diskettes for data entry is by no means unique, it is relatively rare for an educational environment, Almost all administrative applications of the college have also been converted to diskette input.

DCC is located in southern Virginia and has an enrollment of approximately 2,000 students. Computing service for the college is provided locally through an IBM 3776 terminal consisting of a card punch, 50 card/-min card reader, 300 line/min printer and two diskette readers.

This batch terminal is on-line to dual IBM 370s at a consolidated computing center operated by Virginia Commonwealth University and the Virginia Department of Community Colleges in Richmond.

The primary academic use of DCC's computing facility involves batch processing of jobs for students enrolled in programs offered by the Division of Business Sciences. A two-year Associate in Applied Science degree in DP technology is offered; the normal enrollment for this degree is approximately 50 students.

In addition, all students enrolled in the "Principles of Accounting" course use an instructional accounting package developed at the college. About 200 students take the accounting course at any given time.

All business division programs require the introductory course in DP, which places an additional load on equipment. Statistics, engineering and drafting courses also require use of computing facilities, but to a lesser degree.

Prior to installation of diskette-type equipment, DP hardware at DCC consisted of traditional keypunch machines (IBM 129s), with jobs being submitted in batch mode to the consolidated center through an IBM 2780 terminal. Last year, the decision was made to upgrade the existing hardware by replacing the 2780 and 129s with the IBM 3776 terminal and IBM 3742 key-to-diskette units. This change has reportedly resulted in improved operations and a considerable cost savings.

For example, replacement of the 2780 with the 3776 resulted in a savings of $1,956/year in rental costs. In addition, six IBM 3742 dual data stations provide 12 data entry stations at a cost of $14,040/year, while the same number of keypunch stations would cost $22,264.

Data Entry Dimensions

Therefore, the switch to the diskette as a data entry medium has reduced the cost of data entry equipment by $8,424/year and batch terminals by $1,956/year, resulting in an annual hardware savings of $10,380 on these two items.

Better Transmission Operations

Diskette usage has improved data transmission operations significantly, according to college spokesmen. During a typical month of the academic year, more than one million cards (or card images) may be transmitted to the consolidated center. The

(Continued on Page 41)

Utility Links OCR Units, CPU; Quickens Remittance Processing

INDIANAPOLIS — A utility here that handles 200,000 customer payments a month has found moving to optical character recognition (OCR) for data entry provides it with improved turnaround times compared with earlier key-entry methods.

Citizens Gas and Coke Co. has linked two Burroughs Corp. S1800 OCR processing systems directly to its Burroughs B3700 mainframe. Operational studies of the remittance-processing system have shown several benefits, according to Paul McClellan, director of accounting for the firm.

These include improved customer relations because the files are updated more quickly, permitting operators to answer customer questions more accurately; same-day verification of cash; and more timely bank deposits, he said.

Cycle billing for the firm's 200,000 customers results in an average volume of 10,000 payments a day, with a peak of 15,000 transactions on certain days, McClellan noted. On the average, 48% of payments come by mail, 43% are from agencies (banks where customers pay bills) and 9% are over-the-counter or from Citizens' night depository.

Bills sent to customers are produced by a Burroughs line printer in OCR-A type font. A scan line on the front of the bill contains a control code, the customer account number and the payment amount.

In the remittance-processing operation, mail returns (bills and checks) are sequenced and fed automatically on the S1800s. The system reads and stores information from the bill. Each transaction is proved individually, eliminating the need to balance by batches, McClellan said.

The electronically endorsed audit trail on the backs of the documents contains sequence numbers, dates processed, amount paid and the customer's account number. This account number on the back of the check significantly reduces research time on any check returned by a bank for any reason.

Customers paying bills at agencies make checks payable to the bank, and totals are credited to the utility's accounts. Deposit slips and bills are returned for processing. Bundles are read by the S1800s, information is captured on cassette and totals are proved against deposit slips.

Over-the-counter and night depository payments are treated as agency payments, McClellan said, with cutoff times for the cashier area of 9 a.m. and 2 p.m.

"Early timing studies of the S1800s indicated the systems were performing up to or exceeding our original estimates," McClellan said. "At the time of early studies, the systems were processing an average of 3,700 agency items an hour and 887 mail returns an hour."

Bob Eberg, manager of DP for Citizens, said transmission of data from S1800 cassettes to the B3700 four times a day "is an efficient technique that minimizes contention for the B3700's processor time, especially since we have several on-line terminals and applications on the B3700 are closely scheduled."

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With Few Performance Problems

Service Bureau's Add-On Quest Ends Happily

By a CW Staff Writer

SAN FRANCISCO — Rand Information Systems, Inc. is a service bureau which provides language conversion services and sells a teleprocessing system for order entry. With a work backlog presently estimated at $7 million to $8 million, the company can't afford to have its system down for long.

Several years ago, in an attempt to save money, the company installed an add-on memory system from an OEM vendor. Although the memory unit (whose maker the company declined to identify for publication because of a pending suit) worked fine for the first six to eight months, it began to fail thereafter. The performance of the add-on became intolerable, according to Charles Harbour, Rand's data services operations manager.

"The memory would constantly fail. It went down too frequently for us to tolerate, and when we called for service, the response time was far too slow. In addition, it was inadequate; a person would be sent out to pacify us four or five hours later, and he wouldn't be able to solve the problem," Harbour noted.

To remedy this situation, Rand began to look for alternatives and considered in the process, American Micro Systems, Inc., Electronic Memories & Magnetics Corp. and Intel Corp.

After evaluating the alternatives, the company was almost convinced the add-on memory from Intel's Commercial Systems Division would meet its needs. However, it was unable to find a system compatible with its own that also had Intel memory attached, so "a reference check of users helped in selecting Intel," Harbour explained.

Acceptance Tests

To avoid doing benchmarks, Rand had decided to conduct acceptance tests before officially accepting the system. "We thoroughly tested all our applications and then compared the time and cost of running several jobs using Intel's memory and using ours." According to Harbour, "the results were approximately identical."

Rand uses an IBM 370/158 with 6M bytes of real memory to process its own work and to service outside time buyers. Several single- and double-density disk and tape drives, an IMS port, several telecommunications devices and a dual Computer Communications, Inc. CC-8 telecommunications controller complement the hardware, which runs under MVS release 3.7D. The installation also uses TSO and Tcam for telecommunications control.

Harbour finds the company's latest add-on memory far superior to the earlier product. "Overall, we are satisfied with Intel's performance. When we do experience an outage caused by Intel memory, its service people have been able to diagnose the problem and repair it very quickly.

"We are in the type of business that requires a high uptime — more than 90% — because we are on-line and [with the older add-on unit] we were constantly showing outages. It got to the point where we couldn't tolerate it any longer," Harbour said.

The operations manager feels the advantages of Intel's product, in addition to saving his company money, are better fault diagnosis and increased throughput. "The increase in throughput is primarily because its memory capacity can go up to 8M bytes whereas memory from the other add-on vendors and IBM will only go up to 4M bytes."

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Stand-Alone Handles Distributed Data Entry

MELBOURNE, Fla. – Optical Business Machines, Inc. (OBM) has announced the Lasor OCR-One for distributed data entry applications.

The system is a stand-alone DP facility consisting of software and various hardware modules that can be interconnected to construct a processing system tailored to a user's needs, according to a spokesman.

The Laser OCR-One can capture source data, edit and check input data, update and maintain files and generate output files and/or reports relating to the processes that have taken place, he said.

The basic system configuration consists of a central processing module, 10M-byte disk drive, CRT terminal, Laser OCR-One optical character recognition (OCR) reader, a desk-type cabinet and supporting software.

Options are available to enhance the processor and scanner, as are additional 10M-byte disk drives. Also available are the PB-600 matrix printer and floppy disk subsystem.

The basic software includes a multitasking disk operating system, assembler and utility programs. Additional available software includes applications packages, a Fortran compiler, RPG-II, Cobal compiler, Basic, Isam and Itam.

An accounting system can be put on the Laser OCR-One, OBM said, that will allow the user to do the following:

- Handle the capture of employee time records for file updating and generation of paychecks.
- Capture vendor invoice data to update an accounts payable file and then generate payment checks to vendors.
- Capture information pertaining to sales activity so an accounts receivable file is updated and generate periodic reports showing the status of all receivables. The file can be used for generating invoices.
- Consolidate financial operations of the user's business and generate the usual reports with a general accounting module.

A basic system costs $135,000, the firm said from 804 W. New Haven Ave., Melbourne, Fla. 32901.

Diskettes Save for College

(Continued from Page 39)

amount of operator intervention required in the transmission of this volume of records has been greatly reduced by transmitting directly from diskettes, and dropped card decks and the problem of continuously reloading a card hopper on large jobs have been eliminated.

However, the switch from cards to diskettes was not made without some misgivings about the compatibility of diskette usage with an academic environment in which many users, primarily students, are not trained data entry operators. These misgivings were heightened by a failure to locate any other user of diskettes in a student-oriented, academic environment.

DCC found, however, that IBM 3742s can be operated as easily by nontrained personnel as keypunch machines. Operating instructions have been listed in exact steps for the non-DP student.

Some Drawbacks

While there are many advantages derived from using diskettes in an academic environment, there are also some drawbacks. The student must insert the diskette into the IBM 3742 in order to perform any action (look at or change a record). A problem arises when all units are occupied by students keying long jobs and another student wishes to change one record; however, much the same problem exists with keypunches.

This problem has been alleviated to some extent by designating one workstation for use in making corrections only, thus allowing the student with minor corrections to have access to a data entry unit.

The major shortcoming of diskette use involves insertion of records into an existing data set. The 3742 moves records forward from the point of insertion, leaving room for the desired number of records to be inserted.

If the insertion is to occur near the beginning of an extremely long program, several minutes may be required for the movement of records before the insertion can be keyed.

The reusability, simplification of operation procedures, ease of use by non-DP students and cost savings provided by using diskettes as an input medium have validated the decision to switch from card to diskette input at DCC. The continuing decline in the cost of diskettes adds additional weight to this decision.

While a savings of approximately $10,000 may be the proverbial "drop in the bucket" to a major installation, this amount represents a significant percentage of funds allocated for DP hardware at DCC.

Parrish is associate professor of DP technology at Danville Community College.

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Printers Speed Daily Reports to Caseworkers

LANSING, Mich. — The state's Health and Welfare data center here has turned to a nonimpact printing system to help it produce the thousands of daily reports needed by caseworkers throughout the state.

The center serves thousands of caseworkers in three separate departments in the state — Public Health, Mental Health and Social Services — with centralized DP services.

Since their installation two years ago, the two Honeywell, Inc. Page Printing Systems (PPS) used by the center have taken over a large percentage of the printing load from the center's impact printers, according to a spokesman for the department.

Paper Savings

We knew we needed a better means of getting printed computer reports to our staff," William Nash, director of the data center, explained.

"We saw the PPS and decided to rent two of them," Nash remarked. "The additional rental of equipment has been more than justified by paper savings alone. Two PPS are doing the work of seven or eight impact printers."

The systems at the data center produce reports for two categories of caseloads. The Client Information System (CIS) contains data on welfare applicants and recipients, and the Michigan Medical Information System (MMIS) covers Medicaid and Medicare claims.

Caseworkers and administrators benefit by speedily receiving regular reports of their accumulated efforts and by getting faster response to their special requests for printed data from the computer system, according to data center officials here.

Easy to Store

Joel Heilman, director of systems development for the data center, said the PPS reports are easy to handle because they are cut to size and have holes punched within the PPS, making them easy to place in ringbinders and file cabinets.

"The PPS reports have been welcomed by all levels of the departments we serve because they are easy to store," Heilman remarked. "They have an added value because every page is an original with high legibilty.

"With our old impact printers, we made from one to several carbon copies of each page. The top page is usually clear but when you get to the carbons, they can be smudged and hard to read. The PPS eliminates that problem."

The data center deals with requests for assistance, inquiries about welfare eligibility and changes in the status of welfare recipients.

Continuous Updating

In the current CIS file, there are 1.2 million recipients' names that require continuous updating. Another 700,000 names are in the inactive file.

The data center processes an average of 85,000 transactions daily from outlying district offices of the departments it serves. These transactions relate to information on welfare applicants or recipients.

In addition, some 50,000 medical invoices must be processed each day under the Title 19 Medicaid program.

The Department of Social Services has 8,000 social workers in 83 countries, and the data center, which operates within a $20 million annual budget, employs 600 people, including 125 analysts and programmers.

The center's data base can produce all stored information on an individual upon command.

Printing Time Slashed

Bill Griffith, director of operations at the data center, noted that the PPS has cut printing time from hours to seconds in some cases. "Under Medicare, we handle hundreds of thousands of requests to pay drug prescriptions," he explained. "Every day we must process and prepare to mail a large report on these requests.

"With our impact printing system, it took one to three days to take each report through the stages. With PPS, we accomplish the same project in four hours," he noted as an example.

The capability of the PPS to print forms at the same time as data eliminates the need to purchase preprinted forms and makes possible on-the-spot form changes by programming the PPS, Griffith observed.

Information for reports produced by the PPS is fed into the nonimpact printer on magnetic tape prepared by the data center's master computer operation. The tape contains a control block for each job, giving it parameters that govern the printing process.

Ready-to-Mail

"We're saving a great deal of time and money because we purchase rolls of blank, treated paper and roll-feed it into the PPS," Griffith explained. "The control block tells the PPS what size finished product we want, how many copies, how many punch holes and on which side of the paper the punch holes should go. We watch it come out with every copy a ready-to-mail original.

"Before this, we took a great deal of time separating carbons and folding reports to fit into envelopes. With the volume we handle, elimination of any step means large cost savings. The PPS accomplishes many print shop steps at once," he said.

The data center uses a Honeywell Series 6000 quad processor 6080 with five front-end network processors. Linked to the quad-processor are 53 tape drives and 70 disk drives. The system has 1M byte of MOS memory and is linked to approximately 400 CRTs throughout Michigan.

Trial Sample

Griffith explained that he sent a trial sample of the PPS printouts of computerized health and welfare data to district offices before starting to use the PPS on a regular basis.

"I got instant favorable response," Griffith remarked. "Our users are so happy with the PPS output that we couldn't revert to the old method.

"These printouts are much easier to handle, read and store."

The data center's two PPS, which have their own minicomputers, currently run at 12,000 lines/min. They have the capacity to print 132 char./line at 4-, 6-, 8-, or 10 line/in., and they can cut paper to 14 different lengths, Griffith noted.

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Mini Bits

Media, Supply Vendors Graded in User Survey

DELRAN, N.J. — Caelus Memories and Wright Line, Inc. have earned the highest user ratings in their respective product areas following a Datapro Research Corp.'s survey of DP media and supplies customers.

On a scale of one to four — with one representing the lowest score and four the highest — Caelus led the field of disk pack, module and cartridge vendors with an average user rating of 3.8, while Wright Line topped the list of diskette and minidiskette suppliers with a perfect 4, according to Datapro.

In the disk pack and cartridge sector, 3M Co. placed a close second to Caelus with an overall rating of 3.7, while BASF Systems, Inc.; Control Data Corp., IBM and Nashua Corp. all ranked third with 3.6, Datapro said. 3M also finished second in the user ratings of diskette and minidiskette vendors. The St. Paul, Minn-based firm scored 3.7, compared to Memorex Corp.'s 3.6 and IBM's 3.5.

These and other survey results appear in Datapro's feature report "All About EDP Media and Supplies," which also rates suppliers of cassette/cartridge tapes, printer forms and ribbons and punched cards. At a cost of $12 per copy, the report is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

Units Let HP CRTs Yield Hard Copy

AUSTIN, Texas — Any of the Hewlett-Packard Co. 2640 series CRT terminals equipped with HP's 13254A interface can reportedly output hard copy when linked to the first two members of Houston Instruments' 8600 series CRT copiers.

Designated Model 8640 and 8640A, the two copiers use two rows of styli with overlapping dots to produce hard copy in 10 seconds, according to a Houston Instruments spokesman.

When used with electrostatic paper, the 8600 series units can reportedly yield copies of CRT output for one-third the cost of copiers using dry silver paper.

Models 8640 and 8640A cost $4,495 and $4,995, respectively, and are available from the firm of One Houston Sq., Austin, Texas 78753.

Correction

A story about the Seventh-Day Adventists' use of a Wang Laboratories, Inc. minicomputer [CW, Oct. 9] mistakenly carried a photo of two employees of Trans-Air Forwarding and Brokerage, Inc., also a Wang equipment user. The two men were misidentified as Adventist programmers.

Tighten Control of Minis Or Risk Crime, Users Told

By Harry Zimmerman
Special to CW

Minicomputers are inherently more vulnerable to DP crime than standard computers because the three principal protections — division of labor, limited user access and printed audit trails — that are relied upon in standard computer environments are often not realizable or practical in minicomputer installations.

Here's why those precautions are not applicable:

- A mini site usually is too small to economically institute a division of duties for operating personnel.
- Ease of use is a minicomputer selling feature that is compromised when access is limited only to specially trained staff.
- Printed records for audit trails of processed transactions are unprotected and can usually be destroyed without trace.

Many computer professionals and knowledgeable auditors attribute the relatively low rate of minicomputer-related crime to the fact that so many user staffs and potential criminals are not sophisticated enough to attempt embezzlement. The latent thief does not know how easy it is to commit larceny.

It would appear to be quite easy for a minicomputer user to be "taken" since his "till" is open and unprotected. Possibly it is only a matter of time before user staffs become more sophisticated and we begin to hear more about minicomputer-related crime.

Fortunately, users can take steps to discourage minicomputer crime, and we need not depend upon chance or the implicit honesty of staff members. These precautions include physical access restrictions, program and data file access restrictions, control totals and variance tests.

- *Physical access restrictions.* Minicomputers are often situated in a user area such as a warehouse, receiving platform, accounting department or office area. Wherever practical, minicomputers or minicomputer terminals should be located in a locked room that does not permit general access.

Hardware vendors and users should not overlook the need for limited access in designing installations but this neglect appears to be occurring.

When a machine or terminal cannot be kept in a locked room, the unit should have a key lock similar to that found on automobile ignitions. Keys should be issued only to authorized staff, and most important, they must be used and the devices locked when unattended.

- *Computer program and data file access restrictions.* Most minicomputer manufacturers provide software for security passwords. Assignment of these passwords should be restricted to authorized personnel who need to access sensitive programs. For

(Continued on Page 48)

Low-End System Acts as Node In Industrial, Lab Networks

By Jeffry Beeler
CW Staff

FORT LAUDERDALE, Fla. — Just as some small business computers can provide remote processing power in commercial systems networks, so the latest addition to the Modular Computer Systems, Inc. (Modcomp) Classic family provides distributed intelligence in industrial automation and scientific communications networks.

Compatible with all members of the Modcomp II series and some of the company's other minicomputer systems, the Classic 7810 constitutes a low-end addition to the Classic line, which previously consisted of just two models — the high-end 7860 and 7870 systems.

Although the 7810 has limited usefulness as a stand-alone unit, the product serves primarily as a node in distributed processing networks using 7860 or 7870 superminis as hosts, according to a Modcomp spokesman. When operating in a network with the company's recently introduced standard link I/O controller, the low-end system communicates with its hosts in either the High-Level Data Link Control or Synchronous Data Link Control protocol.

Typical customers of the 7810 will use the system for measurement and control in applications like engine testing, energy management and scientific computation, the source explained.

Modcomp places the system in the same product class as the Digital Equipment Corp. PDP-11/04 and the Data General Corp. Micronova and Nova 3. But unlike its DEC and DG rivals, which accommodate a maximum main memory of 64K bytes, the 7810 holds up to 128K bytes, the spokesman noted.

Modcomp also credited the system with providing twice the price/performance of the Model 2 and other low-end members of its Modcomp II systems series.

(Continued on Page 44)

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EAS Dual-Drive Floppy Holds 250K Byte/Drive

LEDGEWOOD, N.J. — Up to 250K byte/drive can be accommodated by the Electro Analytic Systems, Inc. (EAS) dual-drive floppy disk unit, which accesses in 211 msec (average) and in 8 msec (track to track), according to an EAS spokesman.

In addition to the two 8-in. Shugart Associates SA800R or SA801R diskette units, the EAS system incorporates a Tarbell controller, which accepts up to four drives and uses a controller chip and on-board programmable read-only memory for the operating system.

Compatible with the Z80, 8080 and other microprocessors, the diskette system provides a disk operating system as a separate module.

The EAS floppy diskette unit, which holds 3.3K byte/track, costs $1,995 and is available with a 90-day warranty from the company at Box 102, Ledgewood, N.J. 07852.

EAS Floppy Disk System

System Performs as Node In Industrial Networks

(Continued from Page 43)

Unlike the 7860 and 7870, the 7810 uses no virtual operating system and provides no memory mapping or floating point capabilities, the source said. The system also incorporates a traditional 16-bit architecture, whereas the high-end members of the Classic line use a mixture of 16-bit, 32-bit and 64-bit words.

To permit communications with hosts in a distributed processing network, the 7810 uses much of the same software as the 7860 and 7870. For example, the low-end system accommodates Max II, a batch operating system also used by the 7860, and Max III, a realtime operating system for processors incorporating 128K bytes of main memory or less.

Requiring a minimum main memory of 64K bytes expandable in one or two 32K-byte increments, the 7810 comes in three versions — an unadorned CPU board that OEMs can incorporate into larger designs, a basic 7810/2 configuration and a fully packaged system.

In its basic form, the system consists of a CPU and chassis with integral power supply, cooling system and up to three console disk controllers. As a fully packaged configuration, the system typically incorporates one to four of Modcomp's 10M-byte disk units and up to 16 of the company's CRT terminals.

The 7810's processor operates with a 600-nsec memory cycle, provides 15 general-purpose registers and uses the same set of 169 basic instructions as the Modcomp II series.

As a board-level processor with a 64K-byte MOS memory, the system costs $3,250; as a basic 7810/2 configuration, $7,500. With a 10M-byte disk unit and a CRT terminal, a packaged system sells for about $26,000.

Deliveries of all three versions start next year during the second quarter from Modcomp at 1650 W. McNab Road, Fort Lauderdale, Fla. 33309.

Cartridge Transport Unwrapped by DEC

MARLBORO, Mass. — A cartridge tape transport system from Digital Equipment Corp. reportedly stores 256K byte/cartridge and records data in block-addressable form.

DEC credited the TU58's recording technique, which is said to be usually associated with floppy disk systems, with allowing users to replace blocks randomly without disturbing previously recorded data. Many other tape units in the TU58's price class, by contrast, store data in variable positions and thus complicate data replacement, a DEC spokesman explained.

Using DEC's DLV11-J interfaces, the system transmits full-duplex, serial data asynchronously at 150- to 38,400 bit/sec to the company's LSI-11 or its packaged version — the PDP-11/03.

In quantities of 100, the system costs $446 per unit, with additional orders costing $116 in quantities of 100. Volume shipments begin this fall from DEC's Components Group at One Iron Way, Marlboro, Mass. 01752

EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer — the Burroughs B1700 — with card input sequential files and no video displays; we suffered long delays and storage constraints.

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds — all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested — all by only two people — and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance; language-availability, user-utility software.

"I think the real key for the DP manager is the utilities available with the VS — its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it: Thanks to the programming power of the VS, I actually came up with more.

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."

EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason.

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One more thing: the entry level price of the VS is under $50,000. Which is perhaps the most remarkable thing of all about this computer.

For more information on the VS, return this coupon to Wang Laboratories, Lowell, MA 01851.

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Mini Turns Firm's Data Snags Into Smoke

By **Marcy Rosenberg**
CW Staff

WINSTON-SALEM, N.C. — By substituting two small computer systems for a time-consuming manual filing method, a tobacco company has speeded access to production data in its machine shop, which makes spare parts for cigarette production equipment.

The Hewlett-Packard Co. 1000 systems allow R.J. Reynolds Tobacco Co. to track in real time the location and status of jobs in the shop by displaying route sheets on a CRT terminal, according to John Wall, computer systems and group leader for the cigarette manufacturer.

Under the previous manual routing method, Reynolds personnel tore small tickets from a route sheet and posted them as each task was completed. As a result, 1,000 to 2,000 pieces of paper circulated through the shop daily. To determine the status of a given job, the firm had to find the last torn ticket after first looking up the job number.

Besides being time-consuming, the old method did not permit statistical analyses of workload, produce management reports or monitor shop performance, Wall noted.

"The computer systems," he said, "can compare in about 20 minutes the hours needed to produce a part at any time this year to data for similar jobs within the past three years. With the manual filing system, this could have taken months."

Other information processed in batch mode and available to managers includes weekly progress reports indicating shop workload, data on manpower and raw materials needs and biweekly reports of overdue orders.

Numerical Control Tapes

Besides providing data for shop management, the systems generate numerical control NC tapes for Reynolds' growing number of NC-operated machine tools. Previously the company used a Singer Business Machines Model 2301 Flexowriter to produce the NC tapes, "which was a manual method and slower," according to Wall.

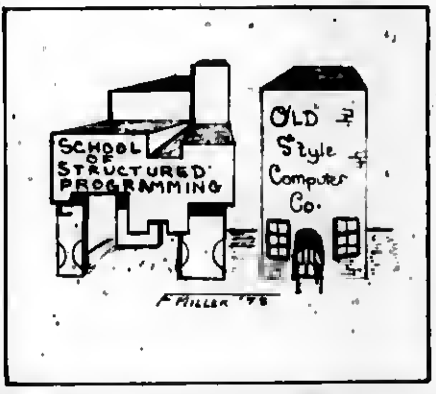
As the firm began to add more NC equipment, "we considered buying another Flexowriter but decided in favor of a computer system, which could not only make tapes but also produce and analyze information for the machine shop."

Both HP1000 systems store 64K words and incorporate a 15 M-byte disk system and 1,600 bit/in. magnetic tape unit. Other hardware includes a paper tape reader and punch, a flat-bed plotter, card reader, line printer and two teleprinters for I/O and punched tapes.

When it originally considered buying a computer system, Reynolds did not want to have to develop its own software. The firm considered the Digital Equipment Corp. PDP-8 and Honeywell, Inc. 2020 systems but chose the HP models because of their Image/1000 data base management software and Query language.

With Image software, Wall explained, "we can put route sheet information on the computer and have the on-line production control we want."

In another application, the firm's engineering department has started within the last three months to use three HP terminals - two Model 2645s with tape cassettes and one Model 26 154 — to determine its project costs.



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WESTLAKE VILLAGE, Calif. — Designed for the Motorola Exorcisor I, Exorcisor II and 6800 evaluation modules, a semiconductor memory from Chrislin Industries, Inc. expands in 4K increments to a maximum of 64K bytes.

Users can expand the CI-6800 by exchanging its 4K by 1 Model 4027 memory chip with its 16K-bit equivalent.

A 16K by 8 version of the product costs $390; a 64K by 8 version, $995.

Chrislin Industries' Computer Products Division is located at Suite 102, 31312 Via Colinas, Westlake Village, Calif. 91361.

Users Warned to Tighten Mini Controls

(Continued from Page 43)

example, a payroll supervisor should be the only one given a password to access a payroll file maintenance program which is used to change pay rates.

The changing of pay rates should be a protected function performed by a payroll supervisor who has been entrusted with the correct password. A second person, such as a controller in a small company or another supervisor in a large company, should have access to this program as a backup precaution.

Similarly, password access can be placed on computer files or specific records in files or libraries. Only an authorized person with the correct password, for example, can query the files for pay rates of employees or other sensitive data. The procedure should include a user list with different passwords for each authorized user in the security system.

In an installation with several terminals or stations, it is often possible to limit queries of sensitive files to the systems or main control station. A user operating a terminal or station on a receiving platform for example, would not be able to access the protected, sensitive files.

Attempted access to the protected programs, files, libraries or data fields would trigger a display of error messages and a processing halt. With some systems, it is possible to log successful accesses and periodically print the log for scrutiny. Such an audit trail is always welcomed by DP auditors.

- *Special control totals.* Control totals are customarily used to ensure input accuracy. However, establishment of "hash" control totals on the pay rate of every active employee in the file can be useful as a security measure.

The basic concept of hash totals is far from new, but it is now more important because of the absence of other safeguards to data and files. Procedurally, the correct hash control total is maintained by the authorized payroll supervisor.

Whenever payroll is processed, the individual employee pay rates should be accumulated and the total printed on a payroll register. The payroll supervisor can examine this printed total to ensure it is correct.

Similarly, in an invoicing system that maintains the selling prices of product numbers in the file, a hash control total of the accumulated selling prices can be established. Whenever the system calculates invoices, it can also accumulate the product selling prices as a hash total. Fraudulent charges could be detected because the hash total would be incorrect.

If a potential perpetrator were aware of the hash control, he could alter the selling price — to favor a chosen customer — and make a compensatory change to the selling price of another product that is sold infrequently to keep the hash total correct.

Knowledge, therefore, of the application of this technique, must be restricted. Obviously, hash totals should not be considered foolproof.

- *Variance tests.* In special situations variance tests can be quite effective. Consider an example in which the selling price is reduced for a customer. The system can provide a monthly detailed sales journal that includes a test and an exception flag for a deviation from a given percentage markup.

The person of authority reviewing the report will be alerted by the deviation and can have the actual invoice examined. A possible loss would be avoided by issuing a corrected invoice.

This precaution also is not foolproof. If a thief knew about the deviation test, he could thwart it by correctly altering the product cost used to calculate the ratio. Obviously, it is advisable to restrict knowledge of this control.

Necessary Bother

Many of the procedures described here can be bothersome to minicomputer users. Locked doors and key locks get in the way. In practice it is often difficult to keep passwords private. Therefore, they should be periodically changed. Passwords have even been written on blackboards for easy reference.

Hash totals are easy to use and effective if the number of changes are reasonable. The variance test is completely nonoffensive. It is operated programatically and rarely requires attention and intervention.

It would become ineffective if the number of legitimate deviations were excessive because a reviewer could not take the time to examine each flag.

For adequate protection, minicomputer users must avail themselves of a judicious selection of available safeguards. Just as insurance is necessary and has a cost, these safeguards are necessary and incur costs.

Zimmerman is manager of management advisory services at Wiss & Co., an E. Orange, N.J., accounting firm.

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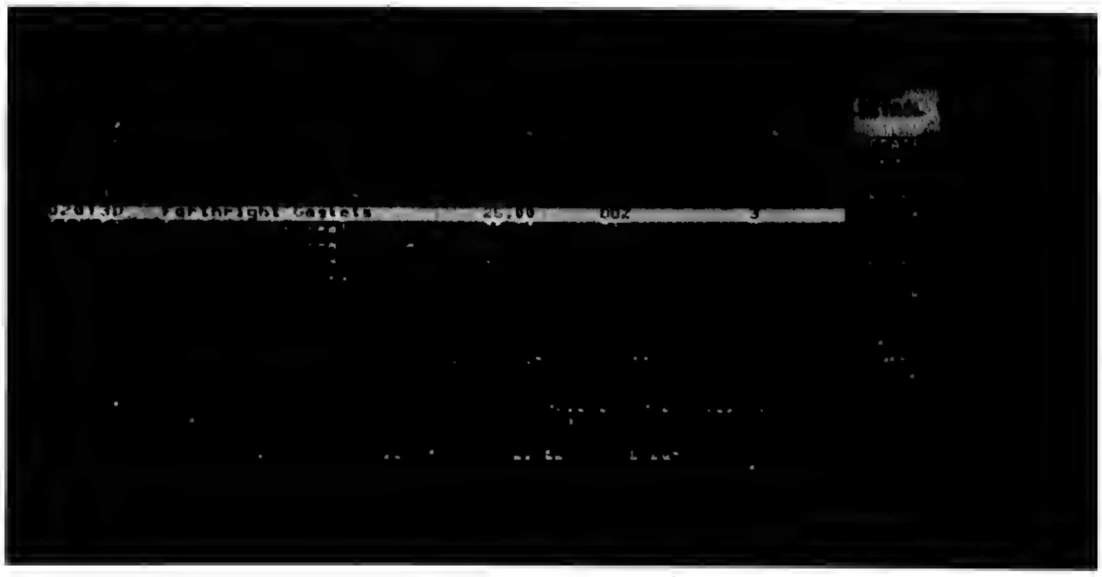

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Guide Geared to Novices

Look Beyond Price Tags, Users Warned

By Ann Dooley
CW Staff

CHERRY HILL, N.J. — First-time users of microcomputer systems should not be swayed by the low price of small business systems but must consider other factors before making a purchase decision, according to a new publication by Management Information Corp. (MIC).

Entitled *Personal Computers for the Businessman*, the publication explains what a microcomputer is and outlines the differences between a micro- and a minicomputer.

Many businesspeople are becoming interested in microcomputers because of their capabilities and low cost but know little about them or what to look for when buying a system. Much of the computer "jargon" is unfamiliar and leaves the businessperson confused and often stuck with a micro system he purchased but which does not really suit his needs, the report indicated.

The publication is intended to help these businesspeople ease their way into the world of microcomputers as opposed to being thrown in full force, according to MIC.

Although price is certainly a consideration, the publication warns that buying too cheap a system may lead to problems later. An expandable system is important to a user, according to the report. If a system cannot be expanded, the user may have to switch systems or even manufacturers, resulting in high dollar and time loss.

MIC advises users to select equipment capable of accommodating more and larger tasks but without extensive, time-consuming and costly alterations.

When purchasing a system, the user should look for a microcomputer which can accommodate the amount and type of peripherals needed. According to MIC, if the system can support only a limited amount of peripherals, the user should know it.

The potential buyer should check that the supplies necessary for the system such as disks, paper and ribbon can be purchased locally at a reasonable price.

Another area of concern for the buyer is the manufacturer's support and service. On-site repair, service turnaround time and peripheral service are important considerations when coping with daily workloads, according to the report.

Turnkey systems might be advisable for many first-time users, MIC pointed out, since otherwise, the user will have to learn to operate the system himself or hire someone else to operate it. It is also important to find out if the system is capable of fulfilling the buyer's requirements for the uses he has planned.

The future of the manufacturing firm should be examined when buying a system. Whether the company is going to continue to diversify its product line, whether it may

(Continued on Page 54)

Underwater Inspector Depends On Micro System for Control

SURREY, England — An unmanned underwater inspection vehicle, developed here, dives, navigates and relays picture signals of an ocean or lake's bottom to the surface with the help of a Motorola Semiconductor Products, Inc. 6800 microcomputer system.

Smartie, an underwater inspection vehicle, uses an onboard microcomputer to record underseas data.

Developed by Marine Unit Technology Ltd., the Submarine Automatic Remote Television Inspection Equipment (Smartie) uses the onboard micro system to interpret manually input signals from the surface and control speed and direction.

The system also accepts input from the submersible's manetic compass and gyroscope to project an artificial navigation target the operator can follow on his CRT screen even if Smartie is passing through an area of low or zero visibility. If Smartie is operating in fast currents, the operator can maintain a fixed position in the water by pressing a "hold" button, and the system will automatically compensate for the current to keep the vehicle in position. The "hold" button is also useful for keeping the craft steady at fast speeds.

The system uses a 6802 microprocessor which includes a CPU and 1K byte of erasable programmable read-only memory. Information is communicated on a time-multiplexed system and comes up from Smartie superimposed on the CRT.

Smartie is linked by a single core cable to the surface and the device is driven by an electrically powered water pump. The unit is also equipped with at least one low-light silicon intensified target camera and a high-resolution video camera and can operate to a depth of 1,000 feet.

Smartie is for hire in the U.S. and comes with three skilled operators. Inquiries can be directed to Marine Unit Technology Ltd., 3 Friars Lane, Richmond, Surrey TW9 1NL England.

National Semi Adds Coder/Decoder

SANTA CLARA, Calif. — Described as the first commercially available monolithic single-channel coder/decoder (Codec) that meets both U.S. and CCITT specifications, the TP3000 from National Semiconductor Corp. was designed for digital coding and decoding of analog signals in the voice frequency band.

The CMOS/Bifet Codec is available in two versions: the TP3001 utilizes u-law coding while the TP3002 is an A-law system. The pulse code modulation systems (PCM) sample a filtered analog signal at 8 kHz and then convert the sampled voltage to an 8-bit companded digital code. The code is then loaded into a high-speed serial output buffer operating at 64K- to 2,100k byte/sec.

Each system consists of two circuit packages and features a power-down mode that when the system is not acutally processing signals, drops power consumption to less than 4% of the standard operating level. In addition, the mode does not have to be externally initialized when starting the system up, the firm said.

Each 2-chip system includes a nonlinear D/A converter, voltage reference with long-term stability, an input digital buffer, input and output samples and holds and control logic.

The TP3000 costs approximately $23 in single quantities from National Semiconductor Corp., 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

First Users Warned Not to Look at Price Only

(Continued from Page 53)

be absorbed by a larger company or even whether it may go out of business are all factors to consider to make a sound financial investment, according to the report.

Talk to Users

Before making a final decision, MIC advises a buyer to talk to current users of the system and find out how it is working for them; if they are unhappy with the system or if the manufacturer won't provide user names, that system should no longer be considered.

In addition to hardware considerations, software capabilities should be examined, MIC suggests. A common complaint among users is the lack of good application software for the kind of job they need to have performed.

Since customized software is expensive, and therefore unattractive to many small business users, off-the-shelf or packaged software that has undergone a few alterations is most often used.

Users should know how to go about purchasing applications software, and MIC suggests four primary sources including the manufacturer, the computer store, mail order programming houses and magazines. Since the manufacturer's software is not necessarily the best, MIC suggests looking at one or all of the other sources before buying.

Introduction and Guide

The publication is intended to be a combined introduction and guide for microcomputer users. In addition to advising buyers how to purchase a system, the report also outlines a number of representative real-life systems to demonstrate both the typical system and the variation between typical systems.

The micro systems discussed in the report are limited to those that are available through retail computer and department stores or through the mail. The report does not deal with higher priced systems or those marketed through other channels.

Prime Candidates

Providing an overview of the microcomputer, the publication suggests prime candidates for a small system. Many of the suggested users are small businesses with less than $2 million annual sales which previously used DP service bureaus, purchased a more expensive minicomputer system or adopted a "wait-and-see" attitude.

Simple definitions and explanations of system components and common micro terms are presented in the report. Hardware and software are defined and explained for the understanding of the average user.

Major manufacturers' systems are presented with an indication of what a typical configuration includes, what applications it can perform and how much the system costs. A complete list of manufacturers and their addresses is also included as well as a glossary of terms and information on the major micro magazines.

The report costs $7.50 from MIC at 140 Barclay Center, Cherry Hill, N.J. 08034.

Rental Company Offers Analyzer

WESTLAKE VILLAGE, Calif. — Microcomputer Rentals has added to its line the Millenium Microsystem Analyzer for development, testing and diagnostic analysis of microprocessor-based products.

The unit is capable of supporting many of the common microprocessor types to provide versatility, the firm said.

The basic monthly rental rate for the unit including an in-circuit emulator is $254. Longer term rental rates are lower and leasing is available from Microcomputer Rentals, 705A Lakefield Road, Westlake Village, Calif. 93161.

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Albert W. Paul
Data Processing Manager
Minolta Corporation
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Recovers From $21 Million Loss

MDS Turnaround Makes Ink Run Black

By Marcia Blumenthal
CW Staff

HERKIMER, N.Y. — Mohawk Data Sciences Corp. (MDS) has been experiencing a financial reversal for the past three years — but it is the kind of reversal that turns red ink to black.

In 1975, MDS lost $21 million, its total debt was $163.8 million and its equity stood at a paltry $13 million. By the end of its last fiscal year in April, the firm posted earnings of $6.2 million, reduced its total debt to $117 million and increased its equity to $40 million.

Obviously relishing the task, Ralph H. O'Brien, MDS chairman and president, recounted the details of the company's capital restructuring at a special press day held here recently. Other executives presented the company's future marketing plans and outlined manufacturing strategies to a group of financial analysts, trade press representatives and industry observers.

O'Brien attributed the company's turnaround to the skills of the firm's top management. Of the 15 top executives at MDS today, 12 have joined the company since March of 1975. All of the newly hired executives are seasoned, viewing themselves as professional managers rather than entrepreneurs, O'Brien stressed.

Moving quickly, O'Brien and his management team streamlined the company's operations, terminating several unprofitable product lines such as plug-for-plug disk replacements and printer products, which were OEM-oriented. In addition, MDS management reduced employment by 40%, closing six domestic and two foreign plants.

Selling off old rental equipment generated needed cash flow. With the funds realized from these sales, O'Brien began to refocus the company's emphasis from the OEM market to the end-user market. He decided to spend $25 millon to launch a distributed data processing (DDP) system; that decision resulted in the Series 21 product line introduced in January 1977.

(Continued on Page 56)

Four Mainframers Report Strong Gains in Third Quarter

Earnings increases for four mainframers during the third quarter ranged from 27.5% to 100% while revenue increases stretched from 15% to 83%.

Amdahl Corp. was the leader in the percentage race, posting a 100% gain in third-quarter earnings as they climbed to $12.8 million or 75 cents a share, up from $6.4 million or 40 cents a share in the year-ago quarter.

Revenues for the period topped $84.9 million, an 83% increase of the $46.4 million revenues reported a year ago.

For the nine-month period, Amdahl's revenues showed a 72% improvement, soaring to $222.6 million from $129.5 million in the corresponding period a year ago. Earnings tallied $33.4 million or $1.95 a share, an 89% increase from 1977's nine-month postings of $17.6 million or $1.10 a share.

All earnings figures were adjusted for the two-for-one stock split in April, the company noted.

In commenting on the company's performance, John C. Lewis, president, said initial shipments of Amdahl's 470V/7 were made before the quarter's end. Shipments from new production facilities in California and Dublin, Ireland, have started.

(Continued on Page 60)

Hawaii Striving to Lure DP Industry

By Ronald A. Frank
CW Staff

HONOLULU — Hawaii provides an ideal setting for computer and other electronics companies to base their research and manufacturing operations, but companies on the mainland are not aware of this, according to Herman Hu, director of engineering at Hawaiian Telephone Co.

At present more than 95% of the electrical engineering graduates from universities in Hawaii have to leave the state to get jobs, Hu remarked, but steps are being taken to reverse this trend.

One of the most ambitious efforts to bring new industry to Hawaii is the formation of the Hawaii Institute of Electronic Research. Established as a nonprofit corporation, the institute will foster research and development designed to create a favorable climate for firms to locate in Hawaii, Hu explained.

Computer communications is a highly promising area; it is basically the type of high-technology, clean industry that the state is trying to attract, Hu noted.

Promise for Industry

Computer development, including the creation of local data base services, holds promise because of the state's orientation toward the leisure industry, Hu said. In addition, the natural distances separating Hawaii from the U.S. mainland act as a spur to research and development in the area of telecommunications.

As one of its first major goals, the institute is determined to create 1,000 jobs in Hawaii in the next five years. Hu believes this goal could well be surpassed once industry becomes aware of the academic research facilities available in Hawaii as well as the labor pool waiting to be tapped.

Despite its image as a playground, Hawaii can offer business a central base from which to open Asian markets. And many corporate executives frustrated with battling severe winter weather would welcome the opportunity to develop their companies in Hawaii, Hu believes.

The institute is being launched by the Hawaii Department of Planning and Economic Development in collaboration with the University of Hawaii and major local industries such as Hawaiian Telephone Co.

Information about the Hawaii Institute of Electronic Research is available from Andrew Gerakas, State of Hawaii Department of Planning and Economic Development, Kamamalu Building, 250 S. King St., Box 2359, Honolulu, Hawaii 96804.

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MDS Gains Turn Red Ink to Black

(Continued from Page 55)

Another cash generator was the company's lease base, which O'Brien still considers one of MDS' strongest assets. Until recently 70% of the firm's revenues were derived from rentals, with the remaining 30% generated from outright sales.

While this strategy is still considered strong, O'Brien noted that a decision was recently made to change that mix slightly. In the future, MDS plans on a 65%-35% rental to sales ratio.

The financial turnaround for MDS occurred in the second quarter of fiscal 1978, O'Brien said. By then, MDS had reduced its interest expense from 10.4% to 4.5% and raised its pretax profit from a negative 10.2% to a positive 8.9%.

Recently a greater emphasis has been placed on marketing and, over the past three years, MDS has increased its marketing and general administrative costs as a percentage of sales from 26.2% to 29.7%.

An industry observer noted that in 1974 MDS had severe weaknesses in its marketing force. The analyst also hinted that the sales force may still constrain MDS because its current products are much more technically refined, calling for a sophisticated sales crew.

MDS will continue to stress data systems in the future, O'Brien said. In 1975, such systems accounted for 43% of MDS' activity; today 75% of its business is derived from sales and rentals of systems.

The systems emphasis along with international marketing capabilities, a broad customer base and streamlined production facilities are, according to O'Brien, the company's other main strengths.

F. William Stamper, vice-president of product planning, said MDS is focusing its marketing efforts on distributed, interactive systems that are host-related. The equipment requirements for this market, Stamper said, "are small intelligent devices to capture data, with limited processing ability but the capability to transfer to the host computer."

Right now, according to Douglas A. Davidson, senior vice-president of marketing, "most DDP users do not require large, clustered terminals at local sites, but rather dispersed, keyboard intelligent devices at many stations. Most configurations need two terminal stations."

MDS' future plans call for product enhancements in three directions: additional functions, including peripherals and communications abilities; additions of high- and low-end systems; and networking abilities which would allow the interconnection of local Series 21 systems. The 21/20 and 21/40 systems will offer a concurrency feature within the next six months, Stamper said.

However, Davidson stressed MDS is not narrowing its product line to only DDP systems. "We have not neglected data entry nor do we intend to. Although we intend to stress the Series 21, we have 400 new customers for our 1200 and 2400 products.

Claiming that the demand for the Series 21 is exceeding the 25% to 35% growth predicted by industry experts for DDP equipment, Davidson said MDS now has 300 sales offices in 13 countries, with more than 2,600 people employed in sales and service.

Although increased marketing capabilities is a high priority with MDS, the vendor has not neglected production efficiencies. The production cycle is now geared to turnout Series 21 products for eight-week delivery, O'Brien noted.

Production Efficiencies

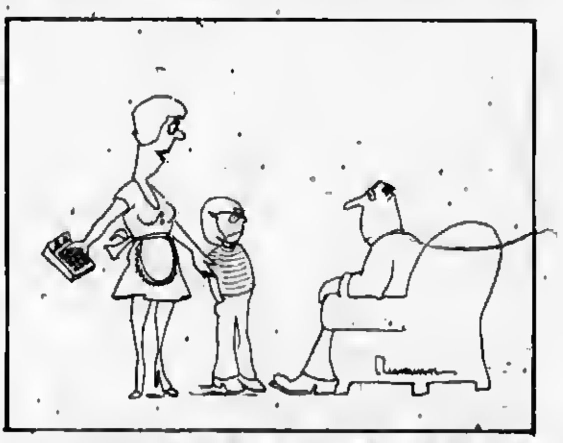
William J. Mann, senior vice-president of operations, attributed the increased plant efficiency in part to MDS' $1 million investment in test equipment. With the new equipment, Mann said, MDS requires fewer technicians and less skilled personnel for assembly.

As a result of the stringent testing capabilities provided by the equipment, Mann said, the Series 21 was introduced with significantly fewer start-up problems than any other product manufactured.

Although MDS seems to be thriving, some industry observers are eyeing excess plant capacity as an indicator either that demand is not growing as fast as MDS executives claim or that the sales force is still a limiting factor.

Furthermore, analysts have pointed out that the Series 21 lacks a transaction processing capability and that its software applications are written in a nonstandard language — Mobol. And, of couse, the effect of IBM's 8100 system is still to be determined.

In the next 18 months, the effects of any weaknesses should begin to surface, one analyst noted. For the moment, however, he was impressed with the financial turnaround MDS has achieved in the past three years.



'He Flunked Math. His Batteries Failed.'

VDP-100 Gets Six Distributors

ANAHEIM, Calif. — Lear Siegler, Inc.'s Data Products Division here has signed six firms to distribute its VDP-1000 small business computer system. It plans to eventually market the system through a worldwide distributor network.

The division expects to have 22 distributors by the end of the year, according to Cathy Raftery, product manager.

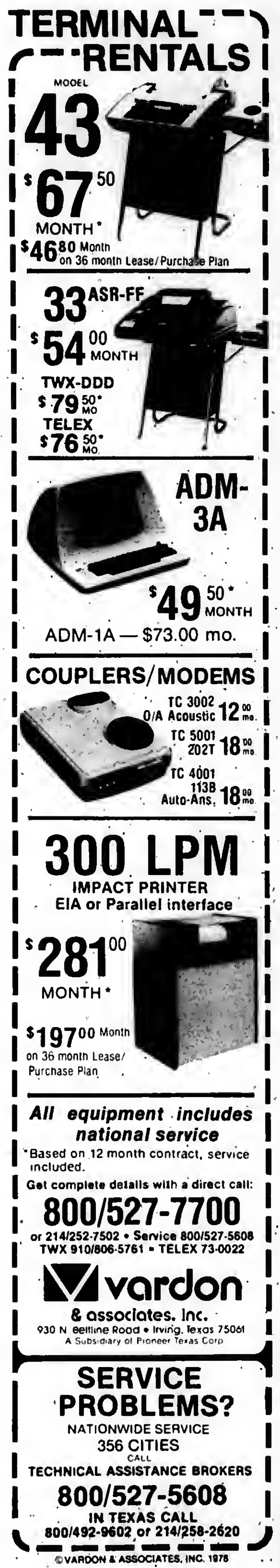
Distributors will fall into three categories — software development firms, service bureaus and systems houses. These types of companies are anxious to enter the small business system hardware market, which is expected to grow "from a current $850 million in annual sales to $1.2 billion by the mid-1980s," according to Raftery.

"Particularly in the service bureau industries, companies are concerned they will lose current customers if they do not have a complete system to market," she added.

While the VDP-1000 is designed and manufactured by Lear Siegler's Data Products Division, most companies producing small business systems do not manufacture their own equipment, Raftery said.

"Most of the available equipment," she noted, "is assembled by small start-up companies. Users therefore must be concerned about how long such firms will be around to support and maintain the products."

The VDP-1000 system is priced at $21,000 through distributors. Its applications software — such as for retail pharmacy, oil products distribution, government and general business uses — is priced "from a few hundred dollars to several thousand, depending on its level of sophistication and on the orientation of the distributor," she said.



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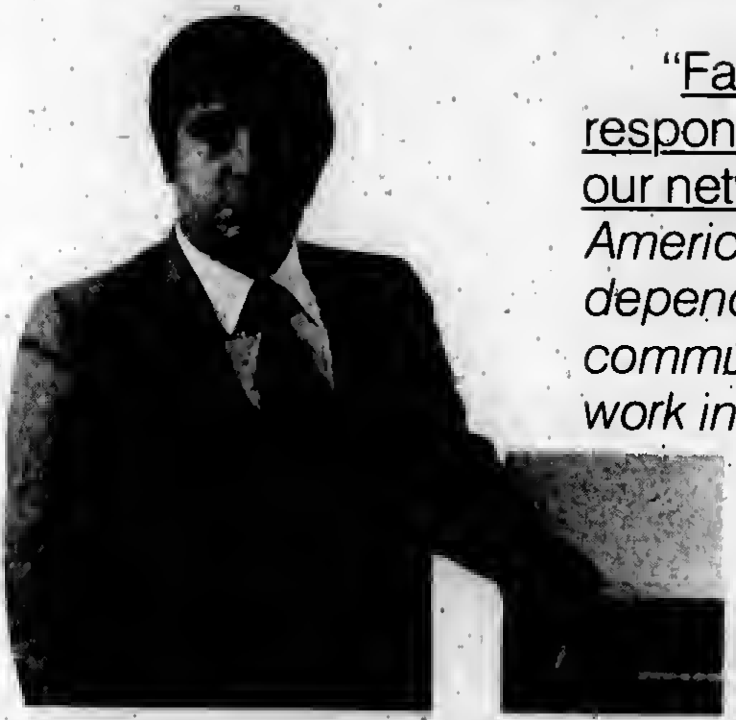

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Canadian DP Trends Predictor Moves to U.S.

FORT LEE, N.J. — Evans Research Corp. (ERC), a Canadian firm that specializes in monitoring and predicting trends within the computer industry, has extended its services to the U.S by opening offices here and in Minneapolis.

The company, a 10-year veteran of computer industry research, plans to provide a series of quarterly updated reports, as well as sponsor a number of DP seminars geared toward the remote computing services (RCS) user, an area which includes everything from remote batch to time-sharing systems.

Info-Dyne, Inc., a local firm interested in RCS applications, will research and write the user-oriented reports and also supply speakers and instructors for each "how-to" session, according to Ron Evans, ERC's president.

The Canadian research company will also publish statistical industry forecasts that will track the corporate motions of the 50 leading RCS vendors through 1985, Evans said.

"We will provide RCS users and suppliers with an in-depth understanding of how to plan for, select and manage a remote computer facility," Evans continued.

Users can benefit from the firm's detailed research reports while suppliers can use the forecasting profiles for "competitive purposes," he added.

The research service is aimed at senior DP managers and executives who need to decide how to choose between RCS, small, decentralized business computers and large-scale mainframes: "As users become more sophisticated and realize they should be using a mix of all three modes of processing . . . we will be there to address their needs."

The firm has already prepared its first user guide and has scheduled a one-day seminar for the upcoming months.

"A Guide to Planning, Selecting and Managing Remote Computer Services" is available at the introductory price of $345, while the course, "How to Plan, Select and Manage Remote Computer Services," will cost $295 and will take place in Stamford, Conn., on Nov. 28 and in New York City on Dec. 5.

ERC's American headquarters is located at 1394 Palisade Ave., Fort Lee, N.J. 07024.

3M Officer Elected Head Of Cbema

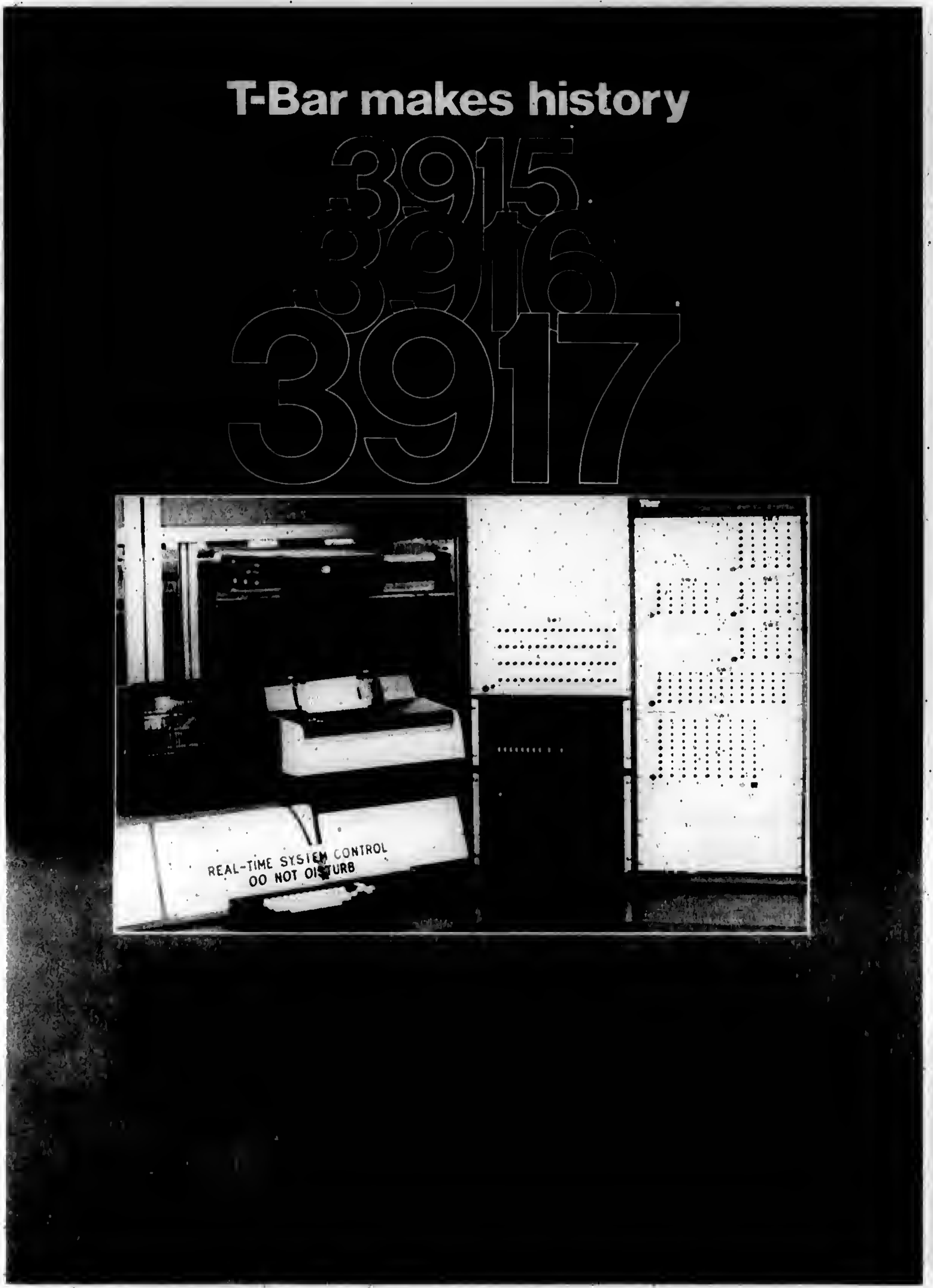
WASHINGTON — Carl A. Kuhrmeyer, vice-president of 3M Co.'s Graphic Systems Group, was elected chairman of the Computer and Business Equipment Manufacturers Association (Cbema). He succeeds Roy L. Phelan, NCR Corp. vice-president of research and development.

Kuhrmeyer heads the 1978-1979 slate of officers elected at the association's annual fall meeting here.

Wallace C. Doud, IBM vice-president of commercial and industry relations, was elected Cbema vice-chairman, Earl P. Behm, 3M Business Products sales manager in the Government Department, was named Cbema Office Equipment Group chairman and Edward Lohse, Burroughs Corp. director of engineering for operations, was elected chairman of the Cbema Data Processing Group.

In their positions, Behm and Lohse will also co-chair the Cbema Plans and Policies Committee, which oversees day-to-day operation of all the association's programs.

Herbert M. Kaplan, director of business planning for Dictaphone Corp. Products & Systems, and Carl Rench, NCR assistant vice-president for research and technical affairs, were elected vice-chairmen for the Cbema Office Equipment Group and Data Processing Group, respectively.



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Decides Against System/4

Decision Data Triples Quarter Net

HORSHAM, Pa. — Decision Data Computer Corp. reported third-quarter earnings of $1.2 million or 30 cents a share compared with earnings of $377,000 or 10 cents a share in the year-ago quarter.

Revenues for the quarter were $14.5 million, up from $8.7 million in last year's third quarter.

Nine-month revenues just topped $32 million compared with 1977 nine-month results of $25.1 million.

Earnings for the nine months were $1.8 million or 44 cents a share compared with $894,000 or 24 cents a share earned in the corresponding period last year.

Equipment Sold

Third-quarter earnings included the gain realized from the $7.7 million sale of the company's U.S. installed base of 96-column card equipment to North American Corp.

The sale of this equipment allowed the firm to prepay $7.2 million of its bank debt, according to Louis H. Benzing, Decision Data's president, resulting in a favorable renegotiation of its bank loan agreement.

The amended agreement provides for a term loan of $12 million and a revolving credit line of $2 million until February 1980. It will result in considerable savings in interest expense, Benzing said.

Decision Data decided to de-emphasize its System/4, a small business computer system during the quarter. This decision was based on the company's assessment that the market penetration for the System/4 over the past year was lower than expected.

In addition, the funds required to achieve the desired earnings were considered excessive, particularly in light of other product opportunities, Benzing said.

"The company's withdrawal from the System/4 program will be done in a planned and deliberate way so none of Decision Data's existing customers will be adversely affected by our decision," Benzing stated.

The firm will concentrate on its printer products, he said.

Financial News

Computer Horizons Gains

NEW YORK — Computer Horizons Corp.'s second-quarter earnings climbed 101% and revenues rose 39%.

Earnings totaled $112,678 or 18 cents a share compared with $56,059 or 10 cents a share in the year-ago quarter. Revenues stood at $2.3 million, up from 1977 second-quarter revenues of $1.7 million.

First half earnings rose 140% reaching $254,519 or 43 cents a share. Last year's first half earnings were $106,224 or 19 cents a share. Revenues for the half topped $4.7 million, up 53% from $3.1 million in the 1977 period.

Commenting on the record year-to-date performance, Ronald Finegold, chairman of the board and president, attributed the gain to the continuing growth of the Software Services Division's client base.

New Registrations

NATIONAL SEMICONDUCTOR CORP., 2900 Semiconductor Drive, Sente Clere, Celif. 95051, has filed to register 600,000 shares of common stock. No underwriter is involved.

DATA DIMENSIONS, INC., 51 Weever St., Greenwich, Conn. 06830, has filed to register 440,000 shares of common stock. Underwriters: D.H. Bleir & Co., Inc.

AUTOMATIC DATA PROCESSING, INC., 405 Rt. 3, Clifton, N.J. 07015, has filed to register 500,000 shares of common stock. No underwriter is involved.

MCI COMMUNICATIONS CORP., 1150 Seventeenth St. N.W., Washington, D.C. 20036, has filed to register 1,120,000 shares of cumulative convertible preferred stock and 240,000 shares of common stock. Underwriters: Allen & Co., Inc.

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Four Mainframers Increase Nets

(Continued from Page 55)

Two products, the 470V/5-II and the 470V/8, have been added to the product line [CW, Oct. 23]. The company also reduced the price of memory for the 470V/7 by $25,000 for 1M byte to conform to the memory price for the rest of the product line, the firm said.

Reductions in U.S. prices for its V/5, V/6 and V/7 were also made, amounting to a 7% price reduction for a typical system configuration, the firm noted. However, Amdahl increased its U.S. maintenance charges by about 5%.

NCR Net Up 68%

NCR Corp. showed a 68% increase in earnings for its third quarter. Earnings topped $46.9 million or $1.66 a share compared with the $27.8 million or 99 cents a share earned during the third quarter last year.

Revenues climbed to $638.3 million, a 15% increase from last year's quarter revenues of $554 million. The figures reported do not include gains from the sale of the company's Appleton Papers Division, which was sold to B.A.T. Industries in June, the company said.

To date, 1978 revenues have passed $1.7 billion, a 10% increase from 1977's nine-month revenues of $1.5 billion.

Earnings for the nine-month period totaled $228 million or $7.95 a share compared with the $83.1 million or $2.98 a share earned in the first nine months of 1977. However, these earnings figures include the contribution of the Appleton Papers Division through June 30 and a nonrecurring gain of $110.4 million or $3.78 a share from the sale of the Appleton Division.

Sizable revenue growth in the third quarter that allowed better allocation of cost items was a major factor in the significant increase in earnings, a company spokesman said.

Control Data Corp. increased its earnings 33% from 1977's third quarter. Earnings totaled $24 million or $1.39 a share, up from $18.1 million or $1.06 in the year-ago period.

However, earnings from CDC's computer business surged ahead 85%, reaching $11.3 million compared with the $6.1 million earned last year.

Revenues from the computer portion of the business came to $479.3 million for the quarter, a 28.7% increase over 1977's third-quarter computer revenues of $373.5 million. The quarter revenues were split just about evenly between sales and rentals of computer equipment.

CDC's nine-month revenues from the computer business topped $1.3 million compared with revenues of $1 million for the first nine months of 1977.

Year-to-date earnings from CDC's computer business reached $28 million vs. the $14.6 million earned in the same period last year. Consolidated earnings were $65.2 million or $3.77 a share, up from 1977 nine-month postings of $48.2 million or $2.80 a share.

In noting that the computer sector of CDC's business was responsible for the largest earning gain, CDC Chairman William C. Norris said the rental base of large-scale computers continues to expand in line with the company's strategic goals. OEM business continued to rise, and data services revenues increased 19% during the third quarter.

Honeywell, Inc. posted third-quarter earnings of $45.9 million or $2.15 a share, up 27.5% from 1977 third-quarter results of $35.9 million or $1.70 a share.

Total revenues were $867.1 million compared with 1977 third-quarter revenues of $711.5 million. Revenue from computer rental and service was $178.9 million, up 18.5% from $151 million in the corresponding period a year ago. Computer sales figures were not available from the company.

For the first nine months of 1978, Honeywell's revenues were $2.5 billion compared with $2 billion last year. Nine-month revenues from computer rentals and service totaled $514.9 million vs. $438.7 million for the period a year ago.

Earnings for the nine-month period were $125.2 million or $5.87 a share compared with 1977 nine-month earnings of $96.4 million or $4.58 a share.

"All major segments of Honeywell's business contributed to the company's strong performance," Edson W. Spencer, chairman and chief executive officer, said.

Combined Show Set in Sweden

GOTEBORG, Sweden — A conference combining two past Swedish computer shows — the Mikrodator microprocessor and microcomputer exhibition, and the Scanautomatic exhibition on process control and automation — will be held here on Nov. 28-Dec. 2.

Called Mikrodatorsystem '78, the conference will cover such areas as computer peripherals, complete microcomputer systems, microprocessors and memory circuits, process control and automation, hydraulics and pneumatics and power transmission.

More than 15,000 attendees are expected at the show, which will be held at the Swedish Trade Fair Foundation's Exhibition and Congress Center. Further information is available from the foundation at P.O. Box 5222, S-402 23, Goteborg, Sweden.

Itel Organization Formed in Mexico

MEXICO CITY, Mexico — Itel Corp.'s Computer Products Division has formed a marketing organization here in cooperation with Mexican investors.

Called Itel Mexico S.A., the firm will market Itel's line of IBM plug-compatible systems and peripherals, including its Advanced System processors, according to James P. Gafke, division president.

Victorio Sanchez has been named general manger of Itel Mexico, responsible for all marketing activities. Sanchez was chief of the DP Coordinating Committee for the Mexican Ministry of Finance and earlier held management positions with IBM in Mexico and Europe.

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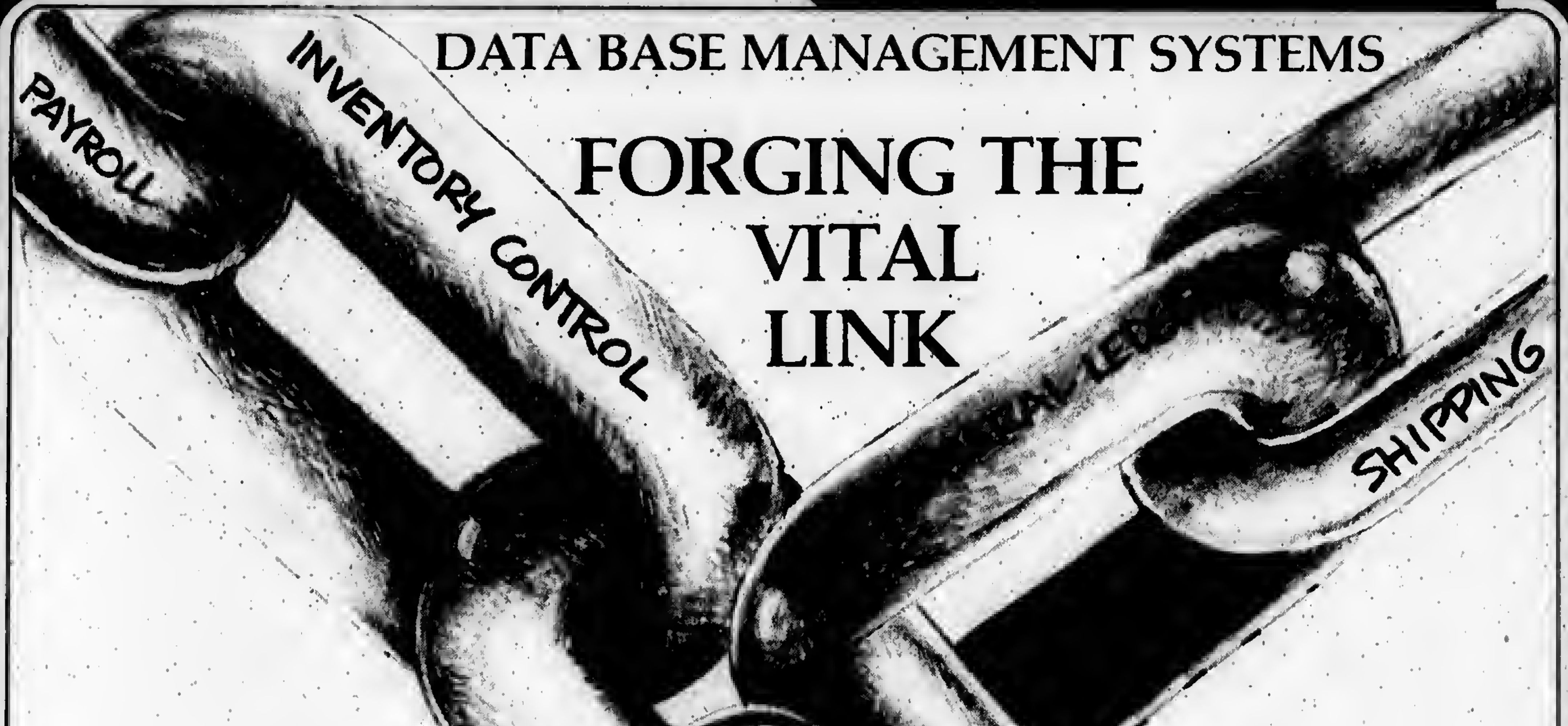
Computerworld Special Report

DATA BASE MANAGEMENT SYSTEMS

FORGING THE VITAL LINK



Oct. 30, 1978
Edited by Don Leavitt

Affects Organization's Planning

Data Base Environment Broadens Users' View

By Leo J. Cohen
Special to CW

Halfway through the 1960s it probably would have been possible to coin a term such as "computer-based data processing." The intention of such a term would be to imply that while all organizations process data in order to manage their affairs, only some of those organizations use computers. If we think in terms of "computer-based DP" as meaning a situation in which an organization carries out virtually all of its DP activities via the computer, then we can see some parallel sense to the term "data-based DP."

In data-based DP, an organization carries out its DP activities in the context of a data base system environment. That is to say, the DP activities largely rely on a common data resource, referred to as the data base, and this resource supports virtually all DP activities of interest to the organization.

This article was excerpted from a forthcoming book by the author.

In this sense, data-based DP might be thought of as the long-term objective for an organization getting into the data base approach. This long-term objective is designed to suite the needs of three broad classes of DP users — end users, those in organizational management and those in systems development. All of them not only have a stake in DP, but potentially can reap certain benefits from the data-based DP environment.

The end user of a computing system, whether he approaches it via a keypunch machine, a remote job entry terminal or a fully scoped console, is generally restrained in the activities that he can carry out by the degree of DP support provided. This is not to say that the user cannot think for himself, but rather that there are limits to what he can do.

As an example, consider a retail buyer who receives a weekly report on current sales by outlet location and merchandise class. This report in effect represents a data base with but a single key — namely, outlet location. That is, the buyer can specify a given outlet location, find the corresponding line entry in the report and read off current sales in each of the merchandise classes.

The buyer may sometimes wonder which outlets have current sales in the range of $8,000 to $10,000 for a particular merchandise class, but in order to determine this he would have to scan the entire column of the report for that merchandise class. This is admittedly not a trivial task if the report has any volume, even though the query, in data base terms, is a simple one.

But here is another query that would render the manual task all but impossible: What outlets have lower sales in merchandise class 3 than in class 4, and have class 1 sales greater than $10,000, or class 5 sales less than $1,000? Faced with the manual processing involved, it is very likely the buyer would go immediately to other things.

Consider now a data base system environment which, instead of producing the report on paper, stores it in the data base as part of the data base system. This makes all of the access methods of the data base package available for referencing the report but, more important, all elements of the report can now be considered as

(Continued on Page S/14)

Perfect Data Base Like Holy Grail

By Garfield Collins
Special to CW

In days of old, knights in shining armor rode off in pursuit of the Holy Grail — the supreme object of Christian relic hunters. Needless to say, they never found it. Perhaps because, as the legend has it, only a knight of extreme purity would ever succeed.

In the modern DP industry, data base has shown a marked tendency to become the new Holy Grail. Those who pursue it often have the same purity of approach as the bold knights were required to have and are equally as unsuccessful.

They pursue a set of supposedly desirable, general objectives without regard to specific needs. This is what we call the "Holy Grail syndrome".

Let us examine the symptoms of the disease and then outline a cure.

What then are these seemingly desirable general objectives pursued by those afflicted with the syndrome?

- Flexibility with changing company requirements.
- Immediate access to the data from many different views.
- No redundancy.
- Program/data independence.
- Accuracy.
- Lower development costs.

The trouble with these as Data Base justifications is that each can be presented equally as disadvantageous. Let's try it both ways.

With data base management systems (DBMS) there can be great logical flexibility of structure and data content.

For example, with a set of product records already in existence, it is easy to add a record type called "Product Type," for a new reporting requirement. The programs that only needed to see "Product" will not need to be changed in any way.

However, if the same company wants to change its distribution philosophy and deliver to customers from a customer-specific depot, instead of from any depot, we are in trouble. The access paths built into the programs must now be changed.

Program logic used to say, in effect, "Access depot stock records for the given product and allocate stock from the nearest depot which enables delivery. Otherwise, generate an order item."

It now needs to say "Access depot stock records for the specific depot which deals with this customer and allocate stock if full delivery" and so forth. The access profile, which is embedded in program logic, has changed.

With several applications accessing a data base from different logical views, the actual organization on disk is a compromise.

When a new requirement comes along, although easy to implement logically, it may not be physically possible to implement within reasonable time without reorganizing the physical structure. But *then* we might worsen

(Continued on Page S/8)

Should Assume Primary Role

Auditors Must Act in DBMS Decisions

By Alan J. Graubard
Special to CW

An entirely new vocabulary has been created and added to the existing collage of acronyms, buzzwords and programming/operational terminology as a result of data base management systems (DBMS).

With this in mind, the adaptation of the DP auditor to the DBMS environment is a colossal task. Unlike DP departments, most audit departments do not have data base experts assigned to their areas. It is therefore the responsibility of the auditor to learn and try to understand the generalities of the various DBMS and then relate this generalized knowledge to the particular DBMS with which he will work.

Given time, the DP auditor would be able to grasp the concepts, learn the internals and understand the techniques involved. Unfortunately, time is not a luxury he can afford.

In many organizations, the auditor is not even involved in the selection process; he is merely told, "We will be using the XYZ data base system." In other cases, the courtesy of being told is not even given, and the auditor becomes aware of a DBMS' in-house use only when trying to access a particular system.

To offset these negative points, the auditor must assume a primary role in DBMS selection and implementation.

Coordinated Effort

The selection process of a DBMS should be a coordinated effort and must include a member of the DP audit department. The criteria established by DP should be reviewed and commented on independently by the auditor.

In addition, efficiency, data security, costs, service, vendor credentials, reliability, backup, implementation, access methods, storage facilities, and future growth potential are areas with which

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BLS Takes Modular Approach to Data Base

By Steve Roman
Special to CW

The Bureau of Labor Statistics (BLS) developed a time-series-oriented information system in the early 1960s. It was a tape sequential system that consisted of a number of subfiles, each of which was stored on one or more reels of tape. The retrieval language that was used provided for extraction, manipulation and tabling of the data.

All in all, it was a reasonably sophisticated second-generation computer system. It did, however, have some drawbacks, among which were overnight runs, a limited responsiveness to user requests and slow turnaround time. In addition, files were not always as current as necessary.

In the early 1970s, a major redesign program was undertaken by BLS to move from the second- to third-generation computers. One of the major objectives of the redesign program was to integrate the requirement for a centralized data base with the production requirements for all of the major BLS surveys. It was hoped that this process would result in a set of readily accessible data bases that could in turn be viewed as one large integrated data base.

Key elements of the plan included a commitment to the data base approach, using the commercially available Total data base management system (DBMS) from Cincom Systems, Inc. and a standard format for time series data.

Labstat, an acronym for Labor Statistics, represents a set of computer programs and a direct access base working in harmony to provide a wide variety of functional capabilities (See Figure 1). The data base approach via the use of Total allows Labstat to be open-ended with respect to the addition of other capabilities and developed in a modular design concept built around an expandable data base with direct addressability.

The Labstat data base resides entirely on direct-access devices, under the control of Total, on an IBM 370/168 MVS system. More than 100,000 time series consisting of roughly 12 million cells reside within 200 million bytes of direct-access storage. Table 1 lists the surveys that currently contribute to the system. From a design point of view, there is no practical limit to the number of series that can be stored.

'Total' Management

As mentioned previously, the Labstat data base is managed by Total. A master or direct access record exists for each series. Linked to the master are record chains of varying length with a set of observations for each year of data associated with the series. This network structure permits direct access on an equal basis to each of the 100,000 series.

The Labstat maintenance module (Figure 2) is a series of subroutines that are called by a drive program to do format conversions and format checking to be sure that the correct files are being entered into the system. The program was designed to allow for the introduction of new data in a simple and straightforward manner.

Since the data is a byproduct of the estimation and/or the tabulation subsystems of the production process, no further editing is required.

User access to the Labstat data base is through four main user-oriented processing systems. Each of the systems, with the exception of the bureau's Table Producing Language (TPL), enters the Total DBMS through a control program that functions as the translation and calling mechanism for each user program. Certain security functions are also performed in the program.

The common interface program assures that data will be retrieved efficiently and correctly. It also means that any modifications to the data base will be transparent to the user programs. Figure 2 depicts the flow of information through the Labstat data base.

Four Major Subsystems

There are four major subsystems within the Labstat data base. A brief discussion of each follows:

- Macro Data Language (MDL) was originally developed by the Federal Reserve Board. The adaptation of the software to our existing data base system was amazingly easy. All data handling is done by a functionally independent routine which was partially rewritten by BLS to access Total files. MDL was designed specifically to handle time-series data and, as such, provides simple but powerful commands for manipulation, displaying and using arithmetic operations.
- The Time Series Processor (TSP), developed at MIT, also provides interactive capability. The system was interfaced with the Labstat data base through the same data handling routine used with MDL.
- The Tailored Retrieval and Information Management System (Trim) was developed to meet the need for utility programs that would load, unload, maintain and list data in the Total system. Trim has become a key element in the procedure to link the Labstat data base with a wide array of user-oriented systems. (Trim was developed before Cincom developed its

(Continued on Page S/4)

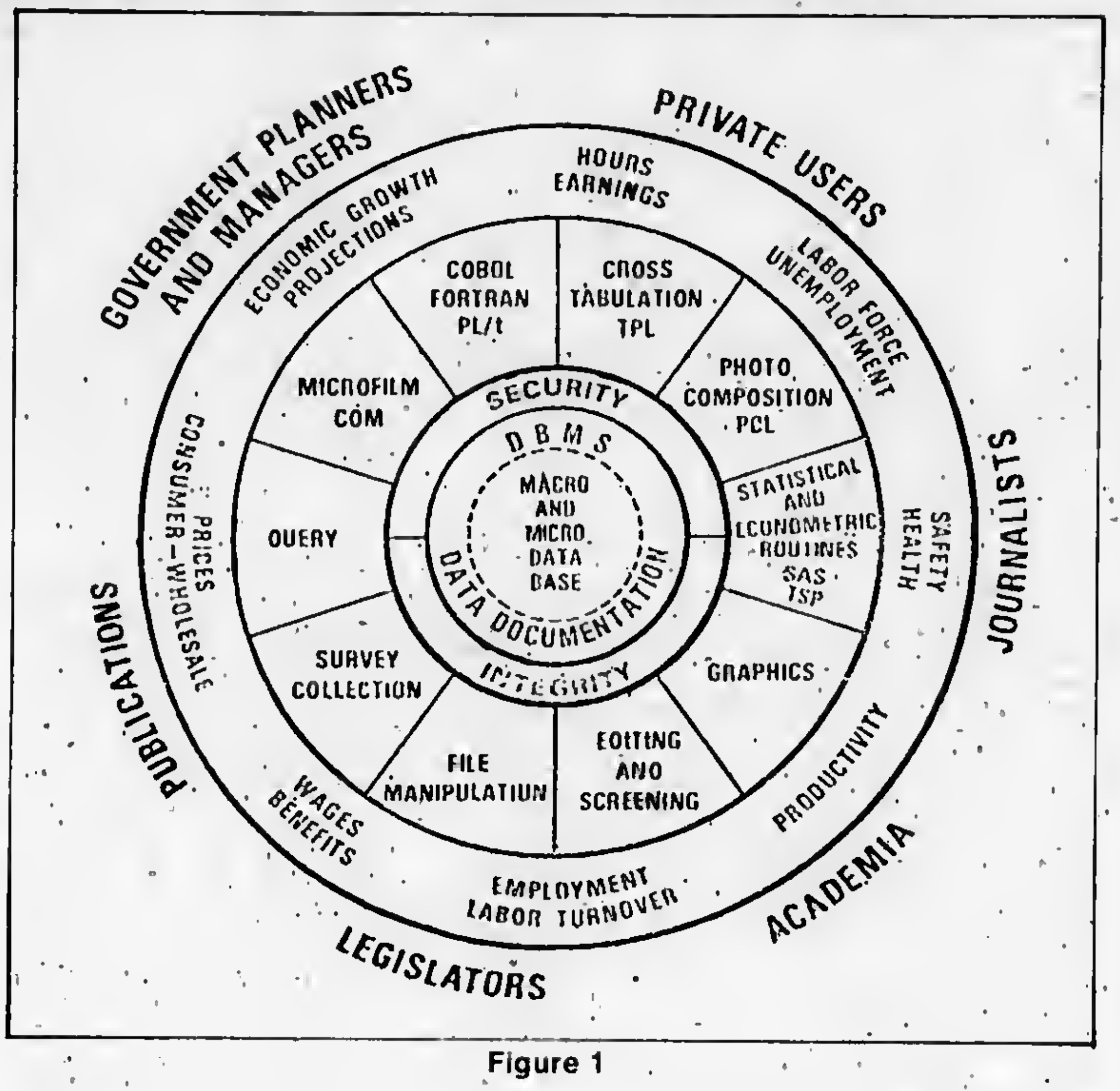

Figure 1

PRINCIPLE TIME SERIES FILES

TITLE	COUNT
Labor force	30,000
Nationwide data on industry employment, hours and earnings	2,850
State and area industry employment, hours, and earnings	20,000
Industry labor turnover	1,250
Consumer Price Index	2,100
Wholesale Price Index	4,100
Industry-sector price index	900
Industry employment and wages covered by unemployment insurance laws	16,300
Unemployment and labor force —	
State and Area	24,200
Imports	700
Miscellaneous	2,200

Table 1

See Us at DECUS Nov. 27-30
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DPL
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Data Base Design Based on Modular Approach

(Continued from Page S/3)

data base administration tools to accomplish the same functions).

- The bureau's Table Producing Language (TPL) has been modified so that it can directly access Total including the special format in Labstat. This interface gives Labstat the capability of producing quality tables for the data in the system. Detailed information on the current version of the TPL, a powerful user-oriented system, may be obtained from BLS.

As previously mentioned, Labstat was developed in the context of an overall plan for the redesign of all of BLS's major systems. The success of the planning effort is indicated by the fact that all of the capabilities as well as an initial data base in excess of 60,000 series, was put in place within seven months by a staff of four analyst/programmers. The addition of series from other sources has turned out to be a relatively easy task, as has been the training of more than 300 people in the use of the system.

The BLS experience shows that long-range goal setting and planning is possible and can pay off. BLS also demonstrated that a modular or functional approach can provide significant advantages with respect to the use of software produced elsewhere.

In addition, it showed that the application of commercially available software significantly enhances the productivity of the development process, not only because of the time saved in not writing some programs, but also because previously used software is relatively error-free.

Finally, the most significant overall accomplishment was the integration of virtually all BLS time series into one on-line data base.

Roman is director of information systems at the Bureau of Labor Statistics in Washington, D.C.

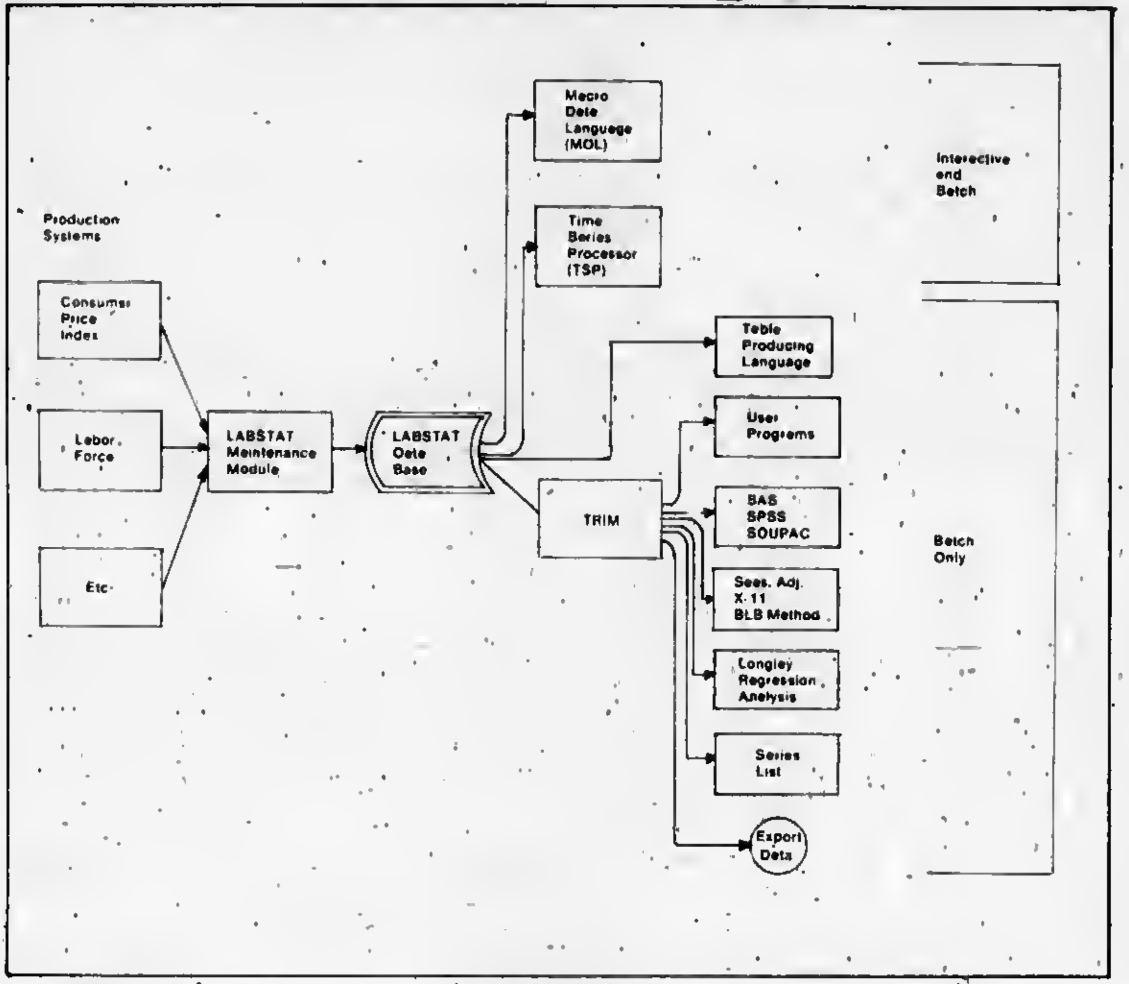

Figure 2

The most exciting DB/DC news isn't in this section
See Page 3 (MAIN SECTION)

Auditors Must Participate in Decisions

(Continued from Page S/2)

the auditor must be concerned.

It is the function of the auditor to investigate the DBMS' potential areas of use in the organization and relate that use to the overall audit plan.

Since independence is of primary concern to the auditor, the methods by which the DBMS will be accessed for audit use must be considered. If an audit software package is in use, the auditor must face certain questions:

- Does it have the ability to interface to the various DBMS being considered or will it be necessary to look for another package?
- Will the auditor have to compromise independence and integrity by being dependent on DP in order to access the DBMS?
- What impact will a DBMS have on existing audits?
- How will the DBMS affect the interaction between the external auditors and the internal audit department?
- What additional costs will have to be incurred in regard to education, program rewrites and additional personnel needs?

Implementation and Use

Once the DBMS has been selected, the auditor has a key role in regard to the organization as well as the audit department.

First, the auditor should be included as part of the team the company puts together to coordinate the conversion. Tight controls must be maintained on all systems and usage of the DBMS security aspects must be reviewed. Any security/control methods currently in use should be carried over, if possible, to the new system.

Also, the auditor should apply the conversion schedule the company will be following to his planned schedule of audits. For example, if the accounts receivable system is going to be the first major system converted to the data base, then all audit plans regarding that system should be changed to adapt to the file and access structures.

Such things as confirmation programs, footing procedures and control listings will have to be altered to accommodate the data structures and additional changes.

The auditor should also include scheduled reports to the organization's audit committee and timely status reports of the conversions' progress.

Graubard is product manager for the Audit Analyzer system at Program Products, Inc., Montvale, N.J.

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At Mobil, RCA

In-House User Groups Discuss IDMS Use

Special to CW

NEW YORK — Mobil Oil Corp.'s International Division and RCA Corp. — users of the Integrated Data Management System (IDMS) from Cullinane Corp. — recently instituted corporate-wide users groups to share working-level experience with data base technology and increase their effectiveness in implementing the IBM-oriented software.

The users group concept has long been used by vendors in supporting their customer installations. While RCA and Mobil both started with the idea, they've taken alternate approaches in implementing it to meet their different corporate needs.

Attendees at RCA's user meetings come from the 12 operating units within the conglomerate that utilizes the IDMS software. The data base system is situated on two IBM 370/168s at RCA's computer center in Cherry Hill, N.J.

The group is informally managed by the users themselves. "People will attend the meetings, get out of them what they want and then not come back for a while," Anthony Somma, manager of accounting projects for the corporate Business Systems & Analysis group, explained.

"The group includes very experienced, new and potential users of IDMS," Somma continued. "And we feel a loose structure best suits its varied needs."

Mobil's User Group

Mobil's user group, in contrast to RCA's, is under the direction of the corporation's computer consulting department. It is a formally constituted committee with attendance limited to less than 20 people.

The company's four European marketing affiliates, which have major computer installations, make up this group. They are either new or potential IDMS users sharing common applications needs.

According to Phillip Allen, senior management sciences consultant and spokesman for the group, "Our main concern is really in developing standards and procedures for the use of the Cullinane software.

"The IDMS systems will have a significant impact on the affiliates' DP operations," he added. "We want to have guidelines for the affiliates to smooth their transition to data base systems technology.".

The ideas for RCA's group originated with Somma when he attended a Cullinane-sponsored users conference in Virginia during March 1978. While there, he recognized a systems programmer from RCA's Telecommunications and Computer Services (Tacs) group. Tacs people run RCA's computer center. They also purchase and maintain hardware and software for the center's users.

Back at corporate headquarters in New York, Somma and his supervisor, Clark Williamson, manager of corporate accounting projects, made arrangements to bring together users for a first meeting on June 13.

"The idea is really perpetuating itself," Somma said. "We had 21 representatives at the June meeting from our operating units which include the Government Business Division, Banquet Foods and the David Sarnoff Research Center in Princeton. There were 38 people at the second meeting and now I'm running out of conference rooms to put all of them in."

Somma described IDMS users' experiences before the group was initiated. "A programmer in one of our units took extension courses to help him implement his application," he noted.

"Another guy just picked up the manual and worked it out that way. Now, with the group, our people don't have to develop applications on their own, using valuable time in the process."

The manager went on to describe meeting topics. "We discuss current and future applications and new software releases. We use the forum to give feedback to Tacs on its users' needs.

"If we see an area where there's a lot of interest, we'll try to form a special interest group," Somma continued. "Presently, one group is concentrating on interfacing IBM's CICS teleprocessing monitor to the system."

Concept Implementation

"The European Data Base Review Committee," Mobil's name for its group, concentrates on new developments and past experiences. The group's two current IDMS users are still new to technology and, therefore, do not have a wealth of information from which to draw.

"We schedule our committee meetings to coincide with our corporate review of data base designs developed at an affiliate," Allen explained. "We want the affiliates to participate with Mobil's Management Sciences Department in evaluating the design. It exposes them to data base concepts they can use and gives the designer added confidence when he goes to implement it.

Mobil's users group originated as a project recommendation of an initial

(Continued on Page S/16)

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College Builds On-Line Information System

By Donald P. Gholson

Special to CW

The application described in this article was developed and implemented by the author at Walters State Community College, Morristown, Tenn., where he served as computer services director for five years. The college has an enrollment of approximately 3,000 students.

MORRISTOWN, Tenn. — In March 1976, Walters State Community College installed a Hewlett-Packard Co. HP 3000. In addition to a wide range of languages, the college also purchased HP's data base management system (DBMS), Image, and inquiry language, Query.

Image is a fully reentrant DBMS that interfaces on the CALL level with applications programs written in Cobol, Fortran, Basic and SPL (an Algol-like assembler language). It uses a partially inverted file structure and can handle up to 99 data sets on an integrated basis within a two-level organization using both tree and plex structures.

Through applications programs, more than one data base can be accessed concurrently. Both Query and applications programs allow concurrent access by multiple users and concurrent access to multiple data sets by one or more users. Read and write access can be controlled down to the item (field) level, as well as at the data set and data base levels.

With this powerful tool at their fingertips (literally, since the majority of the work was done through terminals), the staff began defining the student information system through the medium of the data base's schema. The schema of the data base is analogous to the source program coding of an object-code program. The schema is "compiled" by the schema processor to create a root file for the data base. A second utility program uses the root file to create the empty data base on disk. Once the data base is created, it can be loaded through Query or by applications programs.

The student data base was designed with several factors in mind from experience gained using a batch system:

- There should be one, and only one, source for students' master records, which would serve as the head of chains to each student's individual records.
- There should be a minimum of redundant data stored in the data base (none if possible).
- Because of the requirements for an on-line system, access must be as rapid as possible.
- There should be a single source for all "constant" course data, thus necessitating input of only variable data each term to identify class sections.
- The data base must have the capacity to maintain the schedule of classes of several terms to allow registration for a year's classes at one time, should the administration so desire.
- The data base must have the capacity to maintain permanent records for 25,000 students, including keeping their transcripts on-line at all times.

Using these guidelines, a data base was developed with the data sets and capacities shown in Table 1. The data base used approximately 24M bytes of disk space on the system, which had a disk capacity of approximately 150M bytes on-line.

Data Set Name		Capacity (entries)
SISMAST	Student Master File	25,013
CRSE-CAT	College Course Catalog	1,499
CRSE-MST	College Master Schedule	2,777
ST-HIST	Student Transcripts	250,000
ST-ANNOT	Annotations to Student Transcripts	50,000
ACT-QTR	Current Student Schedules	54,000
FINE-DTL	College "Stop" List	2,500
PEE-DTL	Itemized Student Fees	14,107
FNAIDMST	Financial Aid Master File	73
ANN-MAST	Master File of Annotation Codes	53
PHYSFAC	Physical Facilities Master	497
CAMP-MAS	Campus Code Master File	53
BLDG-MAS	Campua Buildings Master File	17
FINE-MAS	Master File of Fine Codes and Amounts	53
HEGISMAS	Master File of Majors with HEGIS Codes	53
DEG-MAST	Master File of Degrees and Their Codes	53
TCH-MAST	Teacher Master File	401
TCH-HIST	Detail File of Courses Taught by Each Instructor	4,000
DEG-REQ	Requirements for Each College Degree	3,467
FNAIDDTL	Financial Aid Detail Data Set	2,000
GRADS	Graduates of College and Their Degrees	12,000
AUTO-DEC	College Parking Decals	5,000
GRADE-MST	Grade/Course Evaluation Details	15,000

Table 1. Student Information System Data Base

One-Month Conversion

The staff was able to transfer data from various batch-oriented files to the data base and convert the majority of the applications programs to access data in the data base within a month's time. This gave the college the ability to place terminals in the admissions and records office and have them do their own daily processing of applications and updates to student records. This removed a major task from the staff of the computer center, eliminating a duplication of effort, and placed the burden for the integrity of the data on the office that entered and used the data.

In mid-summer of 1976, Steve Jamison of HP's High Point, N.C., office developed an on-line registration program using Image for demonstration at a community college in Virginia. The first pass at a student information system had just been completed when Steve was contacted. He sent a tape of his complete account with the programs and a sample data base.

His program was adapted to the college's data base, and by late August it was running to the point where it could be shown to the admissions office staff. Based on their suggestions and requirements, the program was modified, and it was ready for use during open registration in early September.

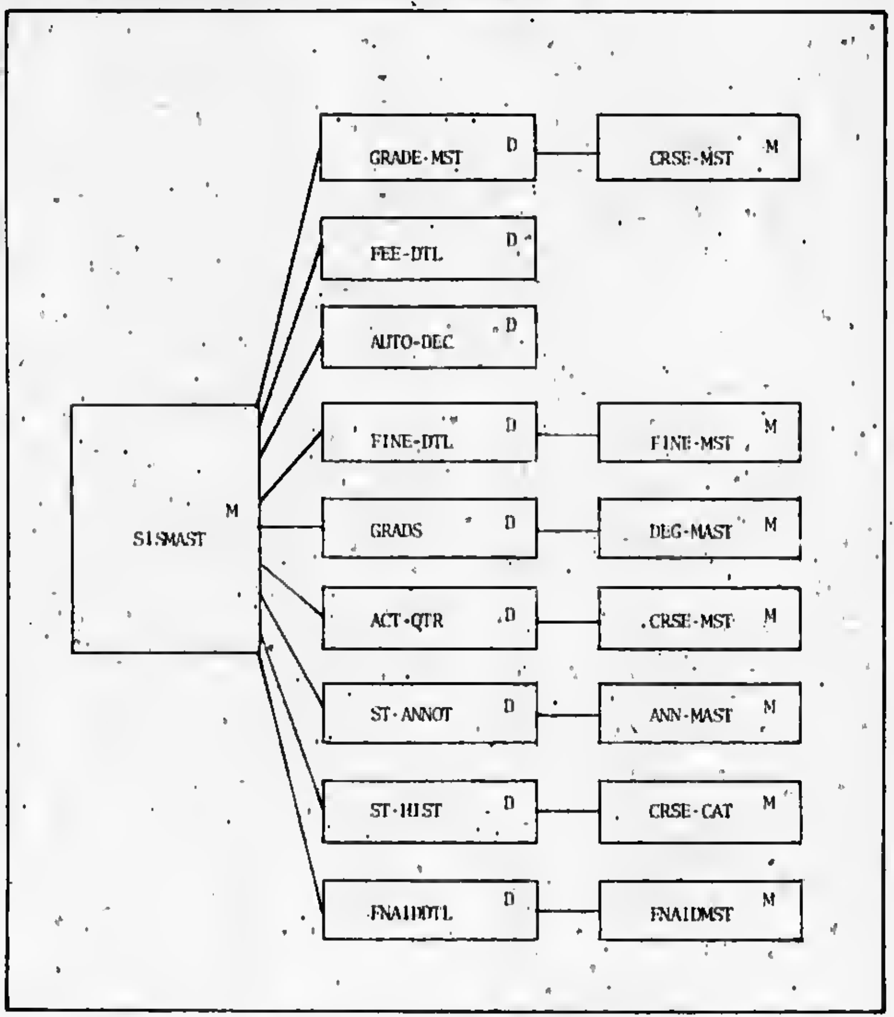

Figure 1. Chaining Pattern

Poor Results

The results - DISASTER! The terminal operators got bogged down right at the beginning with a big rush of students and couldn't recover. Thanks to the quick thinking of the director of admissions and the business manager, the old manual system was used to save the day.

In spite of the difficulties encountered, the staff was determined to make the system work before early registration for the next term, in mid-November. HP was kind enough to have Steve Jamison come in for a day and discuss what had happened.

Basically, we had tried to accomplish too much in one program. Registration fee payment, adds/drops, student inquiry and class rolls were all in one large program. When it ran on five terminals, the system just slowed down.

The solution was to break the program into modules and then use only those needed at the appropriate times. In this way, during registration there were two terminals for loading new students' applications (with an open-door policy new students can apply and register at the same time), one terminal for displaying current closed classes, three terminals for registering students and four terminals for paying fees. With this arrangement, a student could usually register at a terminal in less than a minute and spend less than 40 minutes on campus registering and paying fees.

All of the programs in the student information system were written in Cobol. With the exception of the "granddaddy" program which was obtained from HP and later divided into six separate programs, all of the programs were developed by the college's staff.

In order to resolve the problem of incorrect student numbers or incorrectly spelled names which had occurred in

(Continued on Page S/26)

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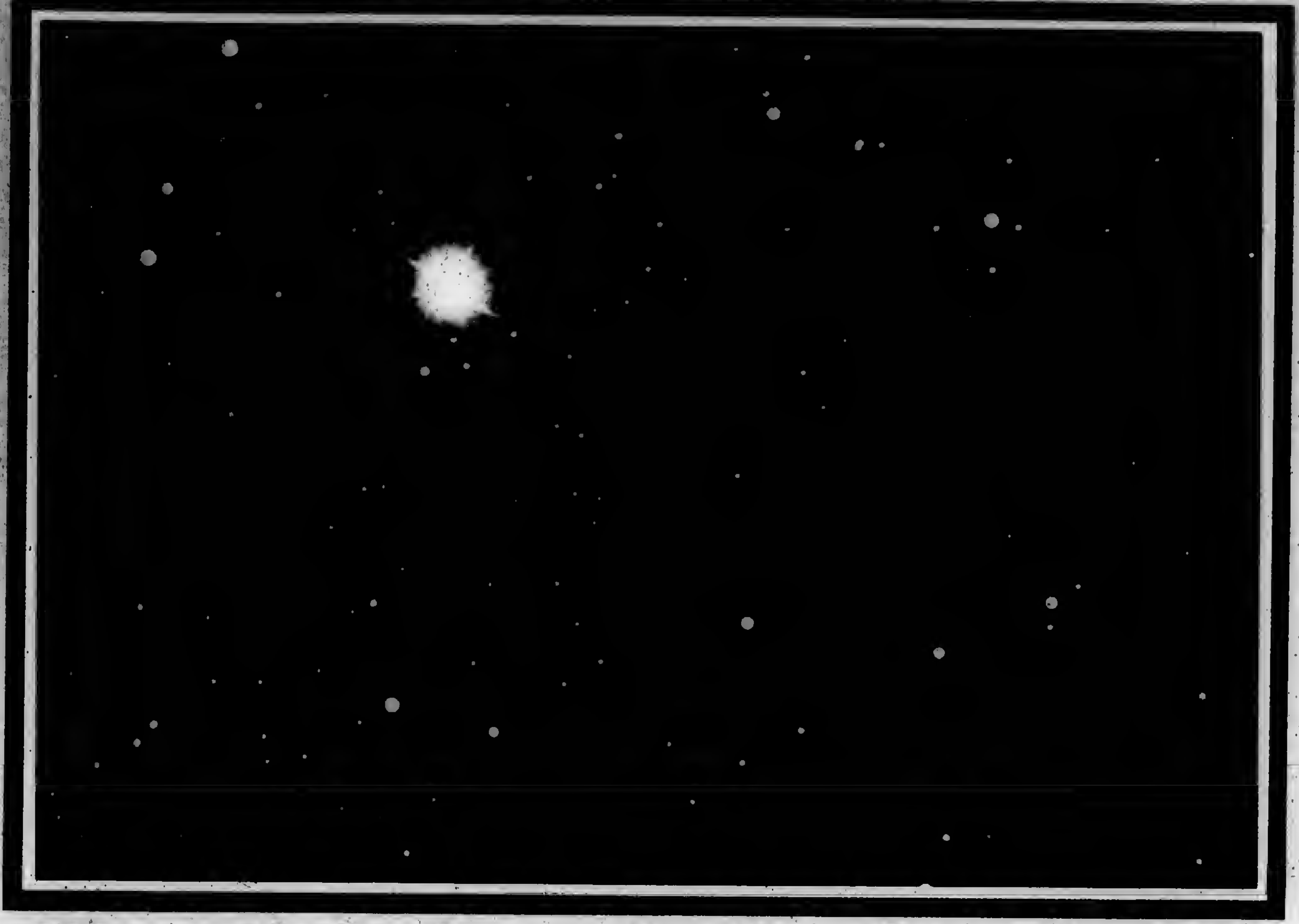

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Data Base Idealists Searching for Holy Grail

(Continued from Page S/2)

the performance of existing systems.

So, should flexibility be a desired goal?

Access from many views is worthwhile, but it is expensive to maintain the necessary linkages. This could be less efficient than successful sorting of data.

Data items are held only once; hence, they are potentially up-to-date, consistent for each use and space is saved.

The cost of maintaining the necessary linkages can be high, though, and in practice, this "advantage" is often at least partially lost because the designers find duplication is necessary to obtain a modicum of physical efficiency.

Accuracy as Neurosis

With data items only held once, more validation can be done on first entry and the use of the data is time-consistent. Unfortunately, the more you achieve this desirable position, the more checking you feel obliged to do to ensure that no accidental corruption has occurred.

As a result, some installations — perhaps rather neurotically — spend as much processing time preparing for, checking for or recovering from integrity faults, than in application processing.

Also, what about human nature? Does the man who maintains this single occurrence of the data actually use it and suffer if it's wrong?

With regard to development costs, programs are much simpler and quicker to specify since the program suite logic is less complex, and increasingly, the data is already defined for the application. In practice, however, the front-end costs can be so high that the effect of these eventual benefits is not very significant.

In addition, access to data can be almost immediate. Any association of data — for which links have previously been established — can be retrieved within seconds. This is fine, if you need it that quickly. But to do it, you need all the data accessible on disk files, all the time.

The Cure

For each of the advantages of these data base goals, there were corresponding disadvantages. Which apply to your installation?

Obviously, the general objectives are not universal truths, merely considerations that depend on what systems are required — now and in the future — for your company.

If you know what you want to achieve in systems terms, you can assess the benefits of data base. The important corollary is that data base techniques will never guarantee your flexibility against completely unknown changes.

A three- to five-year application plan is an essential prerequisite. A strategic study must be carried out across all the application areas in which data base is potentially beneficial.

In the strategic study, an analysis of the overall data requirements is made and trial designs are carried out for a number of DBMS approaches, using the most important functional requirements and a particular data base package as a model.

The outcome is a cost-justified decision on whether data base is to be used and the extent and manner of its use.

For example, it may be decided that the indexes which give the different views of the data are accessed via a DBMS for inquiry and reporting purposes. Operational systems could use logical pointers to files accessed randomly by conventional means.

Following this strategic study, the precise requirements for DBMS software should be known and a formal package selection can be carried out, if required.

Careful Planning

Subsequent development proceeds within the constraint of the overall approach and data structure. This structure is, of course, reviewed if conditions change, but only altered after consideration of its effect on all systems — both existing and future ones.

Let us return to the analogy of the knights, for it appears an effort to attain purity and thus discover the Holy Grail is not enough. The way is beset by pitfalls, unscrupulous plunderers of the unwary, unimagined, steep mountain paths, deep bogs into which the traveler sinks yet deeper as he attempts to extract himself and there is the need for huge supporting armies.

Is it not better to plan the route — and the required logistics — before setting out on the quest?

Collins is consultancy director at BIS Applied Systems, Ltd. in London. His company has carried out data base investigations and projects in 50 organizations in commerce, finance and government installations. He is joint author with E.D.B. Tebbs of Real Time Systems: Management and Design, *published in 1977 by McGraw-Hill.*

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All Have Limitations

DBMS Value Lies in Use — Not Claims, Theory

By William F. Zachmann
Special to CW

Data base management systems (DBMS) are currently the "in thing" in the world of DP. Only distributed processing and structured programming rival the DBMS in evoking articles, buzzwords, seminars, reports and a tireless proliferation of self-appointed experts, consultants and other pontificators.

Suddenly everyone who has had a Rolodex address file on his or her desk and a computer somewhere in the neighborhood has become a specialist in computerized DBMS.

Some very useful things can be done with currently available DBMS. However, some of the things being said about them can make it rather difficult for the prospective user to obtain maximum practical value from a DBMS.

Some rather simple observations about these systems may help put things in perspective.

In particular, three aspects of the current literature, on DBMS make the user's job of obtaining practical value more difficult than it need be:

- The tendency to present DBMS implementation in terms of a "total information system."
- Claims which give the impression that a DBMS does things which, in fact, it does not do.
- Confusion, often engendered by academics, between what a DBMS does in theory and what it can do in practice.

Real Value Overlooked

Every new technology or method with promise tends to go through a period in which it is oversold. In each case, a tool that may be very useful for certain things is touted by its enthusiasts as some sort of "everything machine" that will remove all difficulties. As a result, expectations are aroused which cannot be realistically met. In the disappointment that inevitably follows, the real value of a tool can be overlooked.

Linking DBMS with some notion of a "total information system" very often leads to high expectations.

The best of the DBMS currently available provide a means of maintaining data which can, rightly used, be far superior to older methods. But to link their use to the notion of one monstrous data base which keeps everything from sales information to the chairman of the board's preferred brand of after shave, can prevent organizations from realizing much practical value from the systems.

The "total information system" may be workable in some instances. More frequently, it prevents doing smaller, more useful things, by keeping a systems development staff and users occupied solving problems they never had until the project began. Worse still, the problems they had prior to beginning the project can be made more difficult to solve.

Much of the reason for this, I believe, derives from the second point above. Let's take just one very important example: data independence. Proponents of DBMS (including vendors) will regularly claim that the systems in general, or their own in particular, provide "complete data independence."

This and similar claims make it seem to a prospective user that he need not worry at all about how the data is maintained by the DBMS — a reasonable inference from the claims made. In fact, however, no DBMS now avail-

(Continued on Page S/22)

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Why
did
DATACOM
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See Page 3
(MAIN SECTION)

Should Anticipate Problems

Planning Minimizes Chance of DBMS Failure

By Norbert J. Kubilus
Special to CW

The high cost of gathering, organizing and maintaining data is a growing data processing problem. Most businesses today require data processing to generate their corporate profits, and data bases are regarded as key corporate assets.

Management has increasingly looked to a data base management system (DBMS) to improve its return on the investment in this data. Moving corporate data processing to a DBMS environment, however, is more easily said than done.

Many DBMS installations result in anxiety and frustration. Management becomes skeptical of the DP organization, and end users distrust anyone connected with the DBMS. Analysts and programmers get caught in the squeeze and wonder why neither group appreciates the "good" being done for them.

The failure of any major DP project would elicit similar reactions, but few DP projects are preceded by the promises and optimism of a DBMS installation.

At talks before university and professional groups, I am constantly asked to explain why these installations fail. Smooth conversion of a business to a DBMS cannot be guaranteed, but the chances of failure can be minimized considerably by careful planning, including an open analysis of the potential problems faced in going to a DBMS.

These problems will usually fall into three categories: personnel involvement, applications conversion and cost analysis.

Personnel Involvement

No single individual or department in a company has all the expertise necessary to develop a viable plan for a DBMS installation. Although most of the basic data base management concepts were developed in the 1960s, most of the major systems available today have been developed and marketed within the last six years. In-house expertise in data base management may therefore be minimal within the management, DP and end-user departments.

As many organizations have sadly discovered, attendance at a three-day data base seminar cannot substitute for hard experience with a DBMS. If this experience does not exist in the company, then it should be obtained from the outside — either through new personnel or from a professional service.

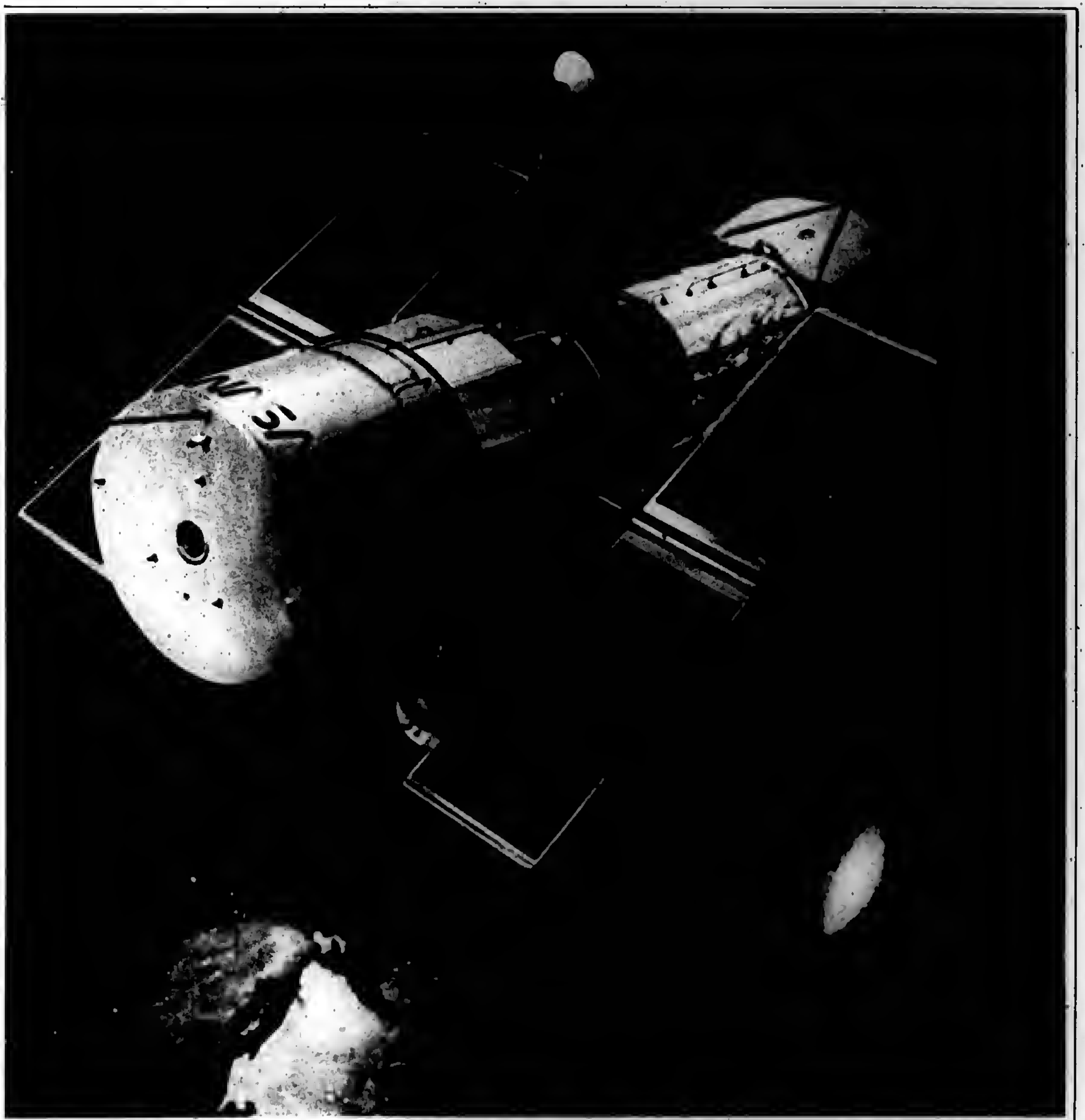
The importance of including management and internal users on the planning group cannot be overemphasized. Both of these user communities have objectives and requirements that must be satisfied by the DBMS.

Nothing can contribute more to a DBMS installation failure than the lack of communication between the DP organization and the rest of the company. As the plan formalizes, the formal education of the affected departments in the company should begin. This keeps everyone up-to-date with the plan and sets the expectation level of users for the DBMS.

Converting a company's DP to a DBMS environment is a large, complex and significant undertaking. A project organization should be set up to manage the conversion effort. This organization's responsibility, authority and accountability will cross departmental lines, as will the impact of the DBMS installation.

A project manager and a second-in-command should be named, and they should

(Continued on Page S/17)



The interactive database system that helps a space-minded company hold costs down to earth.

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Model 204

Computer Corporation of America

SEED ON
DEC 10/20
page S/24

System Helps Drug Producer Teach Salesmen

Special to CW

To help ensure that its field sales force has the training and technical competence required for selling ethical pharmaceutical products, the Career Development Department of Roche Laboratories is using a versatile General Electric Corp. (GE) data management system that is accessed via GE's worldwide computing services network.

Roche Laboratories is a division of Hoffman-LaRoche, Inc., affiliate of the Roche worldwide group and one of the world's largest ethical drug producers. From its U.S. headquarters in Nutley, N.J., the division manufactures Valium and a host of other health care products.

Before Roche sales representatives can make their first sales call, they must complete an intensive training program on the products they will be promoting. Following this extensive training, Roche salespeople must pass an annual qualification test to verify their continuing technical competence.

The Career Development Department has total responsibility for training and testing the entire field sales force, which consists of 700 salespeople and 65 division sales managers. Here, according to Stanley Kleiner, director of career development for Roche Laboratories, is where GE's DMS II data management system and the Mark III network make their greatest contributions.

Roche's entire interactive testing program for sales personnel is stored in the division's data base. Sales representatives attending career development courses can take the tests using teleterminals and CRTs in the Montclair, N.J., training facility.

In addition, 12-pound, portable terminals are available for use in field offices or at home. With these terminals, salespeople can gain access to the interactive testing program anywhere in the country by means of a local telephone call, via the Mark III network.

Visible Measure of Progress

"We are extremely pleased with the way all our testing programs are working on the service," Kleiner said. "They are providing exactly what we need by giving our sales representatives instant feedback and a visible measurement of their progress.

"The interactive testing program also reduces the administrative load on our nine career development trainers, giving them more time to work with individual salespeople," he said.

Bob Braden, a career development regional trainer, fully agreed. Braden indicated that the service helps with virtually every aspect of training and testing.

"Our field force data base contains a tremendous volume of information about our sales representatives, including their education, achievements, prior experience with other pharmaceutical companies, courses and seminars completed and scores on Advanced Qualification Program (AQP) tests. This data helps us determine when a sales representative is ready for additional training and which courses are most appropriate," he explained.

"Initially, we tried to use in-house computers to administer our interactive testing program, but the system couldn't accommodate our needs," Braden said. "The CPU simply couldn't handle the loads we put on it."

In contrast, as many as 20 salespeople now can take computerized tests simultaneously, ranging from such areas as anatomy, physiology and the nervous system to federal regulations on controlled substances. "With our current interactive testing, a person learns by doing," Braden said. "He gets immediate feedback, which reinforces his learning."

Each test question is multiple-choice and if a person fails to select the proper response, the computer provides a reference for finding the correct answer. Braden indicated that the interactive testing program is a great help in preparing sales representatives for the rigorous AQP test, which is administered annually. All AQP questions, answers and sources are computerized and the tests are administered on CRT terminals.

"Throughout all our testing," Braden said, "downtime has been negligible." According to Kleiner, career development has experienced no loss of training time as a result of program problems.

"Our training is geared toward developing and improving our sales force's professional, technical and communications skills," Braden added. "MARK III Service helps show our sales representatives where they are in terms of their learning. This greatly reduces anxiety about taking qualification examinations.

"In fact, we found that if people aren't given access to the interactive testing process, their apprehensions about taking examinations are heightened," he said.

Career development training programs are available to all qualified salespeople. These include basic clinical rotation programs at major medical teaching centers and graduate-level clinical programs at leading medical centers in psychiatry, anesthesiology, clinical pharmacology, cardiology and infectious disease.

The clinical rotation programs allow Roche sales representatives to gain a firm grasp on therapeutic decision-making by observing resident physicians for two weeks, Braden said. "Ob-

(Continued on Page S/22)

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In fact, it's not a Data Base Management System at all, rather the world's most advanced TP Monitor. But TP is one of the most critical elements of an effective DBMS System. The trouble is many users select their DC as an afterthought resulting in a significantly compromised DB/DC environment.

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Data Base Environment Changes Users' View

(Continued from Page S/2)

potential keys and the query capabilities of the data base system may be employed to investigate questions such as those posed above, and a broad spectrum of arbitrary inquiries that go well beyond them.

This aspect of data base allows the user to expand his thinking. With the data and its derivative information available in arbitrary, easy-to-specify form, the thinking that he would devote to the process of manufacturing the information can now be diverted to exploring some of the horizons such information makes available.

Thus, the advent of a data base system environment on which the end user depends for his DP support may indeed radically modify the way in which he envisions his function, plans for its operation and finally carries it out.

Organizational Management

It has been said that a successful data base system that achieves a high degree of data-based DP must necessarily become a model of the organization itself. That is, an organization's activities at present and as projectable into the future are to a very large degree dependent on the ways in which information flows through the organization and interacts with the organizational elements that process, manipulate and employ it.

A data-based DP environment, in which a significant amount of the information processing of an organization is supported by data base, is therefore a mirror of this information flow and as such forms a model of the organization's activities. In this context, then, where information flows from point to point throughout the organization, the model of organizational management becomes one of monitoring performance at critical points of interest, and synthesizing the information thus gathered into tactical and strategic planning. This represents the true function of organizational management.

Thus the data base system environment not only provides the model of the organization in the sense described above, but because of the access that it offers to the data base, which in turn is part of the data base system environment, it is clear that the monitoring of informational flow in the organization is the equivalent of inquiring into the data base system.

Obviously any data base system that incorporates services to support organizational management is one that is prepared to offer that management new latitudes of flexibility. In fact, in terms of management functions this may well represent new dimensions of organizational control.

It is the accuracy, responsiveness and timeliness of information about the organization and its operation that gives this dimension meaning and ultimately makes it one of the most powerful motives for considering the data base approach.

Systems Development

The third strong motive for considering the data base approach has to do with the development of new application systems. As pointed out earlier, the file-oriented approach looks at each problem separately. We specify a problem, derive algorithms for its implementation and directly associate programs with data in files.

This implies that the data has essentially one functional application, so that any subsequent use of the data demands that it be abstracted from the file, reorganized to suit the needs of the new application and replicated for that purpose. The data is redundant, but furthermore a new application also requires the development of additional programs to prepare, present and maintain the data.

In the data base system environment, one of the major virtues is that the data base provides data as a community resource for its community of users. Thus data in the data base is available to all current users (up to privacy and security considerations) and therefore becomes a major building block — already constructed — in the planning and implementation of new systems development.

If the data base grows, this resource of already-developed data modules grows as well, and one consequence has to be that system design and implementation schedules are ultimately foreshortened, since new systems build primarily on what currently exists.

This point becomes more forceful when one considers that application programs in a data base system environment are effectively I/O free. That is, all I/O activity that leads to data presented to an application program in a data base system environment is carried out on behalf of the application program by the data base management package. This is achieved by the application by means of a subprogram CALL.

Thus there is no direct I/O activity and its associated logic need not appear in the application program. As a consequence, the application program itself is less complex; easier to write, debug and document; smaller in the execution environment; and achievable in greatly contracted schedule time.

And finally, this approach to application program development offers an unparalleled opportunity for standardization and documentation.

Cohen is president and founder of Performance Development Corp. in Princeton, N.J.

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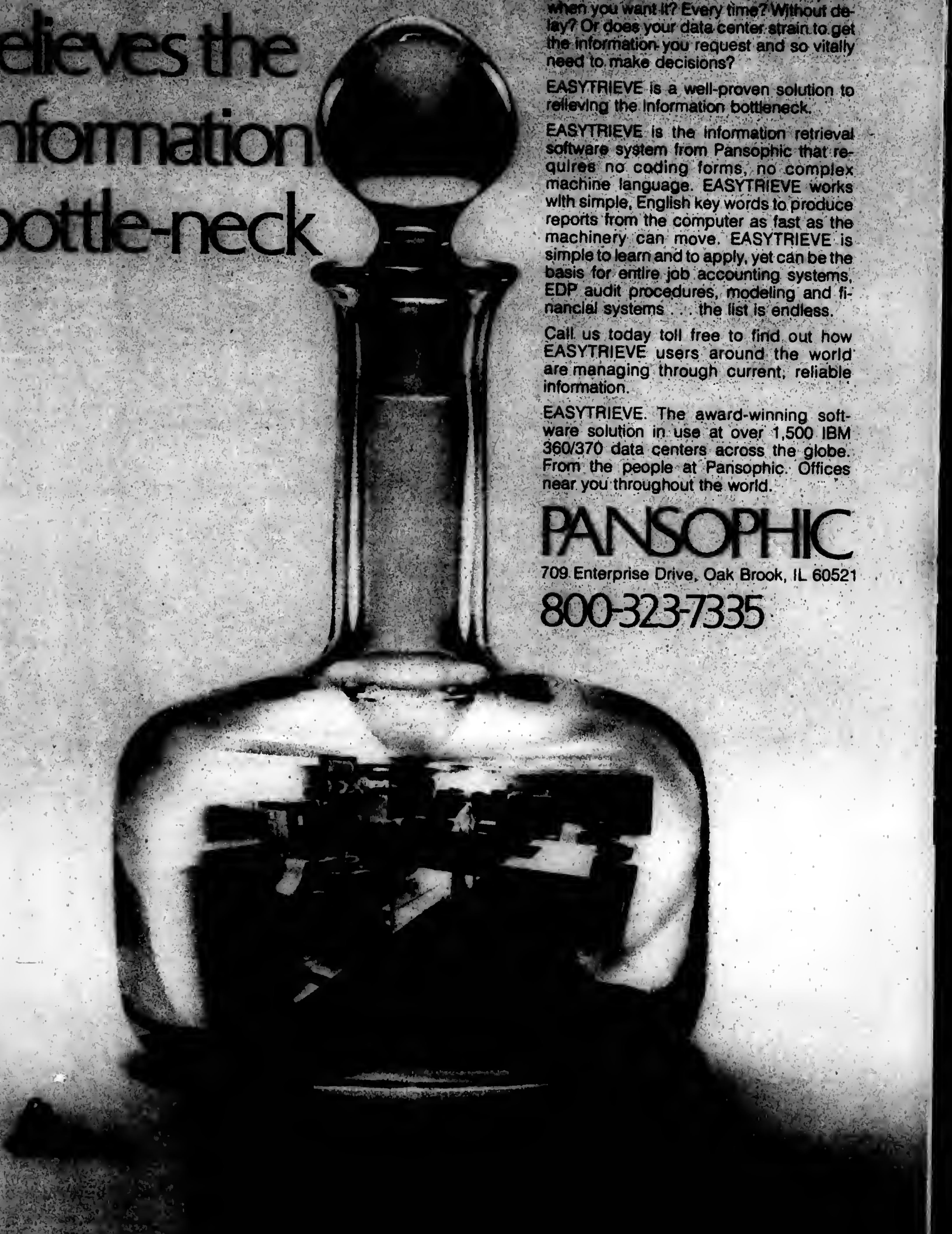

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In Corporatewide Groups

Mobil, RCA Users Discuss IDMS Techniques

(Continued from Page S/5)

study of the IDMS software at Mobil's French affiliate in 1976. Mobil Oil Francaise and the English Mobil Data Services Ltd. have used IDMS since 1977. The company's German, Italian and Japanese affiliates also anticipate using IDMS.

The committee is chaired by Stephen E. Storey Jr., who is manager of commercial applications. After each meeting, a report is written up and distributed to interested Mobil affiliates throughout the world.

Second Meeting

At the group's second meeting in Paris last July, attendees reviewed Cullinane's Integrated Data Dictionary (IDD). The IDD is an add-on package to IDMS which maintains up-to-date information on the location, definition and status of a corporation's entire data resources.

Cullinane's Casey was at the meeting and discussed the system's fine points with Mobil representatives.

"As a result of the French affiliate's study of the IDD and our July review meeting," Allen, the Mobil Group's spokesman, said, "the Management Services Department now recommends the package for the affiliates' use.

"Although our affiliates are autonomous, they rely on the department's judgment," he explained. "Data base management is a broad area to cover, and we realize there's a lot to learn. We're using the committee to help us in the process."

Casey has attended user meetings at RCA as well as at Mobil and discussed Cullinane's own use of the concept. "We listen to user groups whether corporate, IDMS national or IDMS regional to evaluate our software products honestly and thoroughly.

"By continually responding to users' needs, we keep our clients ahead of computer technology. As a result, 99% of our users renew each year," he pointed out.

"This kind of interaction can be as useful to corporate management in improving data base techniques as it is to Cullinane as a vendor in improving its products."

'Trouble Log'

RCA's Craig Kellum, the Tacs product coordinator for IDMS, explained how the group's "trouble log" benefits both users and Cullinane. At each users' meeting, attendees write down problems they've experienced in running their applications. The entries are then discussed.

"By sharing our collective experience, we can see if the problem has cropped up before and if it is in the software or the program being run on it," Kellum noted. "If it is in the software, I can call in Cullinane to install a temporary program fix, and Cullinane can correct the bug in its next software update."

According to Kellum, RCA bought an initial version of IDMS in 1971. "Integrated data base technology has been around for a while, but management has only recently become aware of it," Kellum stressed. "You can see the trend in the increase of users within RCA alone.

"In 1975 we changed to Cullinane's version of IDMS when we upgraded from our Univac Spectra 7s to the IBM equipment," he continued. "At that time we went from one to three users. In the last couple of years, that number has jumped from four to 12 users."

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What's ADR up to in Data Base technology?

See Page 3
(MAIN SECTION)

Planning Can Help Cut Chance of DBMS Flop

(Continued from Page S/12)

have a major responsibility for keeping applications functioning during the conversion process. Many companies choose to make their data administrators totally responsible for the conversion effort; but these individuals do not usually hold a high enough management position to be effective in running a project organization that does not exist administratively.

A DBMS project manager who has the most success is the one who knows the company's objectives, understands the functioning of the internal user departments and their applications and comprehends the DP implications of a DBMS.

Applications Conversion

Not every application can or should be converted to the DBMS. Three classes of applications can be defined: the candidates for immediate conversion, those that will be converted at a later date and those that will either remain unaltered or be replaced.

Phased evolution into the DBMS environment should be a major goal, and the primary candidates for conversion should include only those that can be run in parallel to test the conversion results..

Too often, analysts and programmers see the DBMS conversion as an excellent opportunity to introduce changes in an application or program. What they do not realize is that the expectation of failure during conversion is directly related to the number of unnecessary changes made. Save the modifications and enhancements until after the converted software has proven reliable.

Because of their involvement in the conversion planning, end users will be able to provide feedback that will be extremely useful in determining the success of the DBMS installation and in recommending future data base applications. This feedback also provides the information necessary to make the installation plans more flexible; usage requirements for data are too dynamic to force adherence to a rigid conversion procedure.

The price tag on a DBMS is only the tip of the iceberg. While the software may cost anywhere from a few thousand dollars to more than $200,000 to purchase, this amount does not affect the true cost of ownership.

Maintenance fees, training fees, installation charges, documentation costs and consulting fees are not always bundled with a DBMS. Other software enhancements, like changes in the operating system or the addition of a compiler, will also add to the start-up cost.

Serious thought must also be given to the existing hardware in the company. The DP systems may not have the capacity to handle the proposed data base environment.

Although improved DP efficiency and reduced data handling are two of the benefits of using a DBMS, there is a trade-off in the need for a large amount of main and mass storage. Some systems require overhead exceeding 10 times the size of the data in order to operate; other systems have an almost open-ended requirement for overhead based on the number of linkages requested between data records.

It is not uncommon to hear stories of installations increasing their hardware capacity simply to handle the unexpected load generated by the data base software.

What if a DBMS does not exist for the hardware currently being used? This question hits most second-generation shops very hard, but it also affects companies which cannot find an adequate DBMS for their hardware.

Political and budgetary factors can determine what additional hardware may be considered. For second-generation shops, the cost of a

(Continued on Page S/26)

SEED ON MODCOMP
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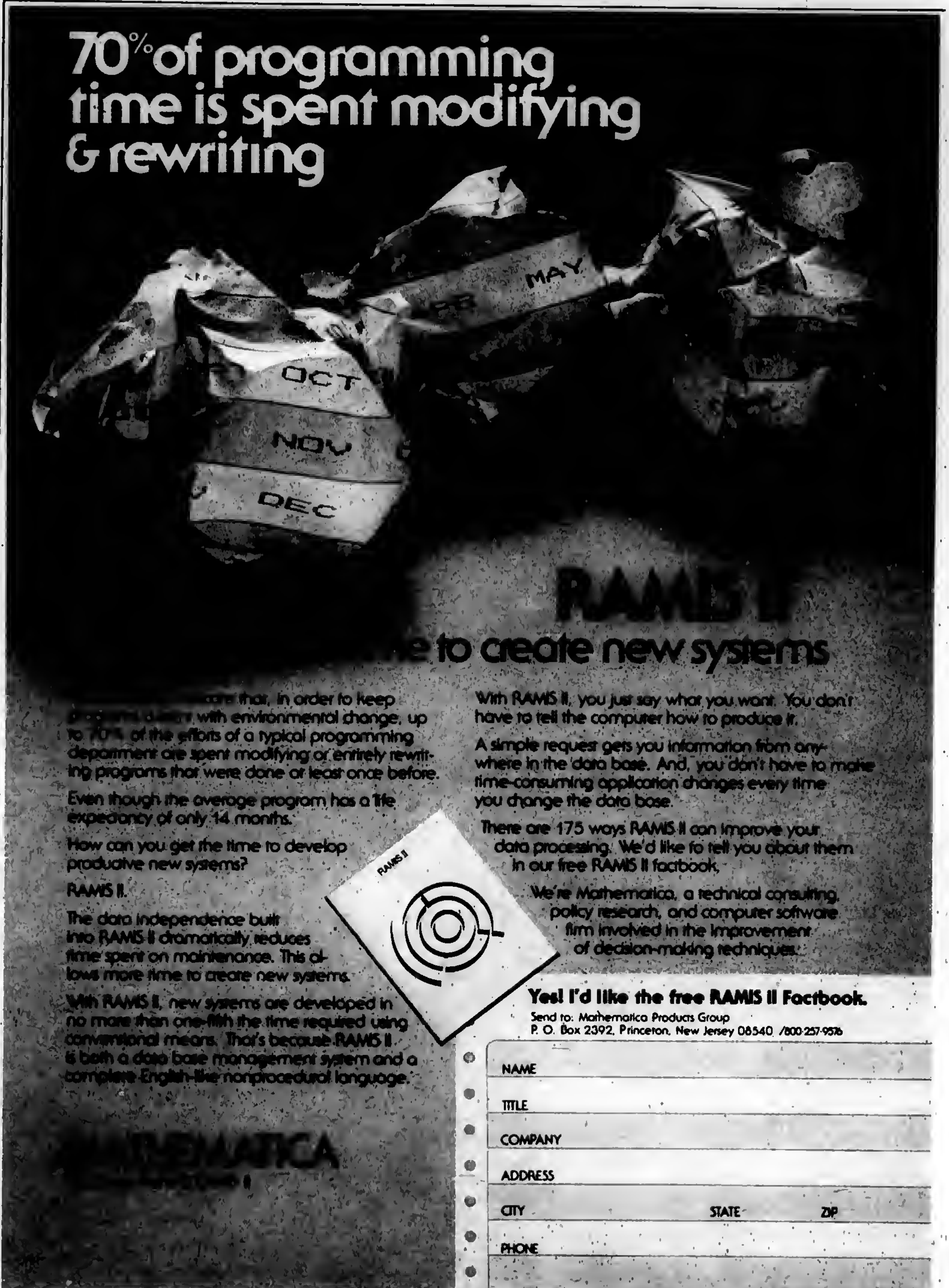

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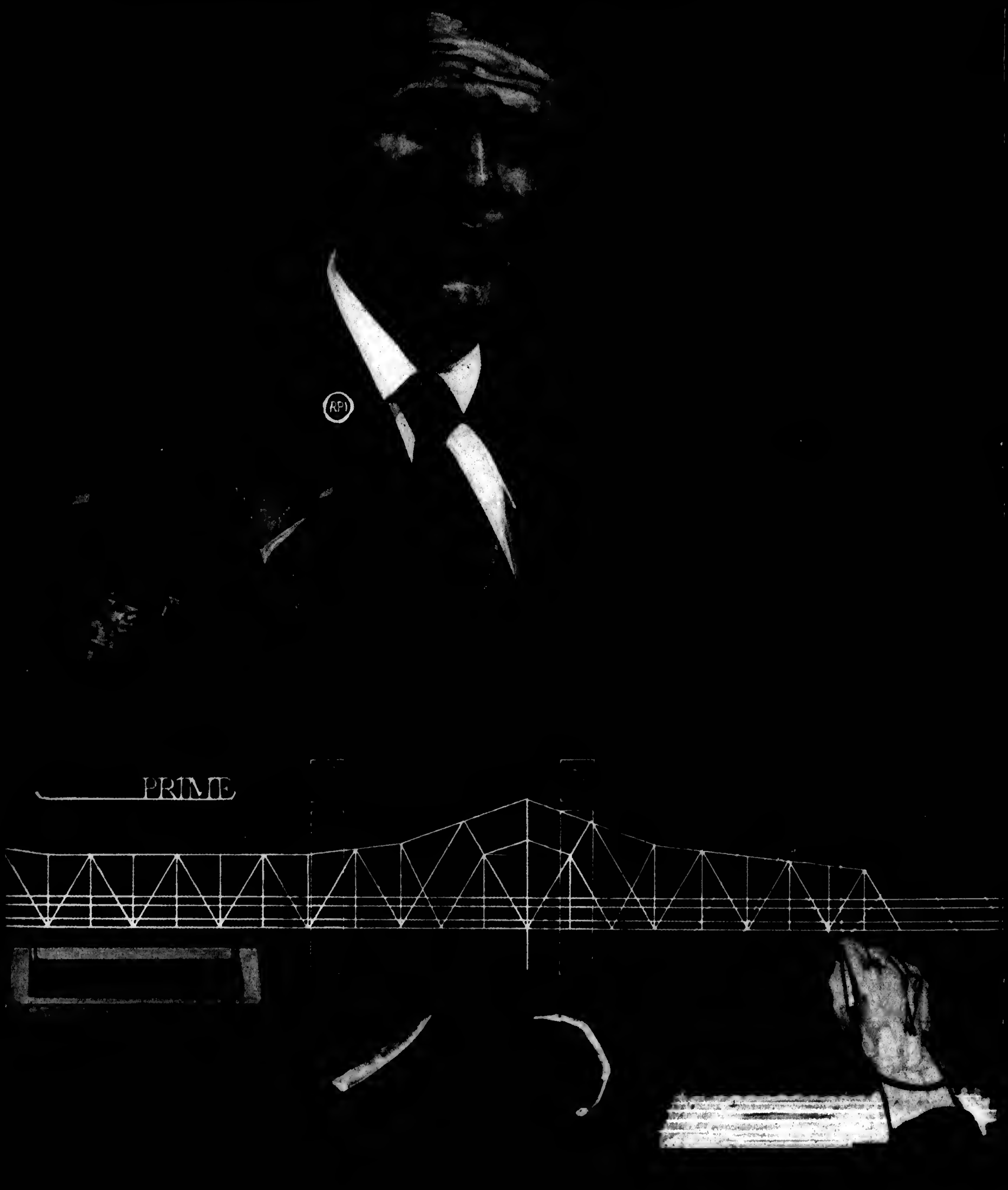
Dr. George S. Ansell, Dean of the School of Engineering, Rensselaer Polytechnic Institute, Troy, New York



Engineering educators at Rensselaer Polytechnic Institute, one of the country's top technological universities, believe that interactive computer graphics offers students, especially undergraduates, an intuitive, visual understanding of engineering problems and concepts that conventional computers, with their emphasis on abstract data, have failed to provide.

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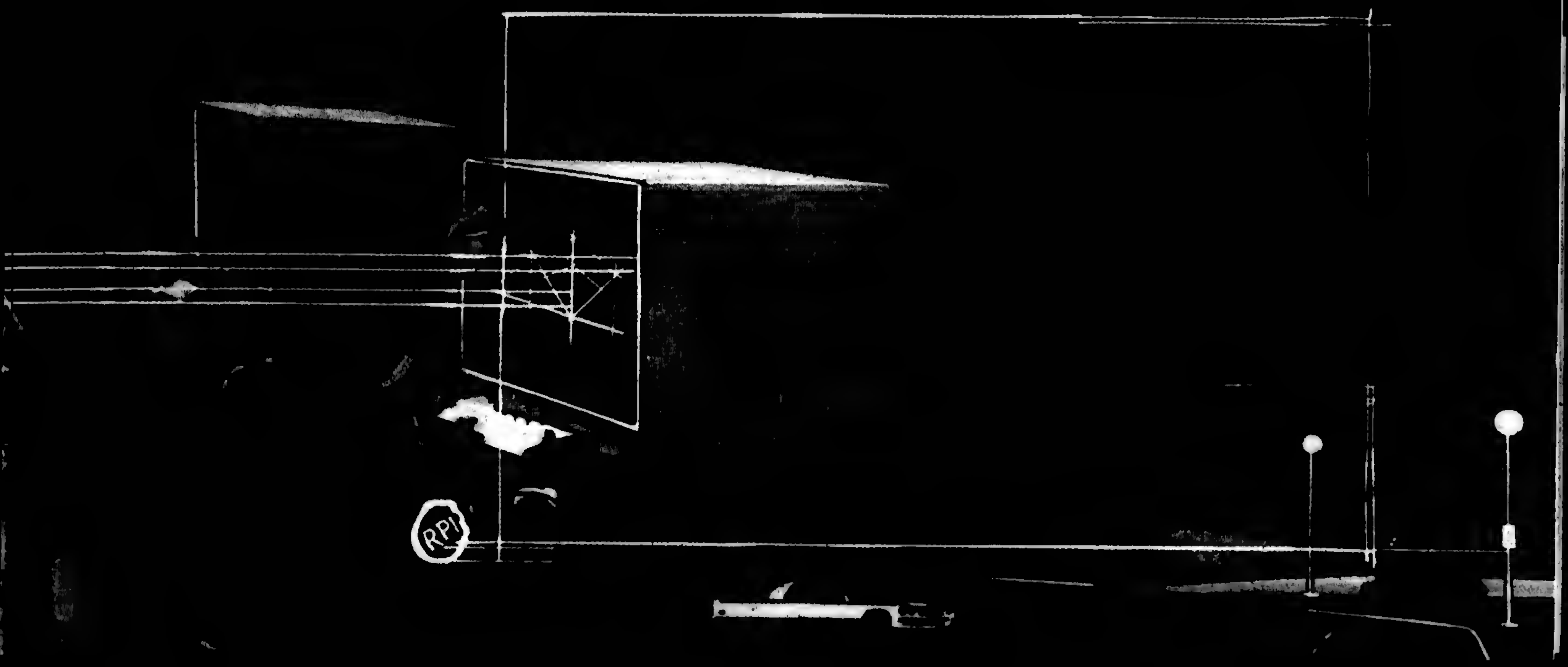

Turning Back to Users

What Will Come With Third Age of DBMS?

By Scott B. Guthery
Special to CW

Generations of computer hardware replace one another. Generations of computer software accumulate. When the movers come and wheel out the trusty old D/5 machine and wheel in the brand new E/6, something discrete and identifiable has taken place.

The purchasers of the new E/6 will call it a new generation. Software, however, doesn't come and go. It spreads.

To be sure, some *numbers* change. Fortran II was followed by Fortran IV and Snobol 2 by Snobol 4B. But there just doesn't seem to be the same kind of breathless anticipation for PL/II as there is for a new breed of machine.

The first problem is directionality. Machine performance measures are generally agreed upon, and new machines score higher than old ones. They are faster, lighter, smaller, more reliable and so forth. We know where we want to go and how to measure our progress in getting there.

This is certainly not true of software products. An "improved" version may be slower, bigger, harder to use and less reliable than the old version and yet tout itself as ushering in the dawn of a new age of productivity.

The second problem is research activity. One is currently hard pressed to find hotbeds of delay tube development or sense switch engineering — although the flying spot store is making a comeback. The general rule of thumb in hardware is that if you know about it and it's not being worked on, consider it part of a past generation.

In software, everything is being worked on all the time. The names may change and the problems may divide and multiply, but the work plods on and the same answers are found again and again. Software doesn't wear out, but surprisingly few people act as if they understand this.

In spite of these observations, I contend there are currently three identifiable generations of data base management software. During the first generation, designers looked toward the users and built automated analogs of the data base management systems (DBMS) they saw these people using.

During the second generation, the designers turned toward the machine and built efficient and stable versions of the objects they found themselves dealing with in the first generation. In the looming third generation, the designers will turn back to the users and automate the processes they use to handle these objects.

Old Ways

New technology is typically first used to do old things in old ways. Thus, for example, atomic power was used to blow things up. Data base management software is no exception to this rule.

During the first generation, roughly 1940 to 1965, data base management software was basically a punched card rendition of the data handling systems its designers found in use at the time. Work schedules became flowcharts and everything that wasn't nailed down in the accounting office or the file room was cast as a program or a data set.

This behavior by the system designers was purely defensive. For fear of being found wanting — that is, not being able to deal with some quirk or special case — the designer automated everything in sight.

That way, when someone wanted to know if provisions had been made for the 3- by 5 in. card that came over Tuesday afternoon from the peppermint shoelace division with the hog belly forecast that had to be part of the Wednesday financial report, the Thursday division activity report and the Friday 3- by 5 in. utilization report, the designer could just point and say, "We do that here."

This happy state of affairs — automate what you see — could have continued undisturbed had not someone observed a computer is something other than a file cabinet. This time, after the bomb went off, the ground glowed in the dark.

New Ways

This realization did not come, as one might have expected, from the people who had to use the systems the designer built. Perhaps his software copies were so much like the originals it was impossible to tell them apart.

Rather, the origins of this realization are to be found in events totally unrelated to the quiet ebb and flow of business statistics. What happened was the solid rock of Gibraltar from which the designer cast his automation net — the computer — began to go through a kaleidoscopic series of changes.

During the second generation of data base management software, say 1965 to 1980, the designer was forced to turn inward — away from the user and toward the machine — to study the intrinsic nature of the tool he was using.

This is not to say there were no cries of anguish from the outside world. "What do you mean it's going to take you six months to convert these programs? I just spent four million bucks for a brand new Whizzer 3608. I want my work done faster, not slower!"

(Continued on Page 5/24)

"Thanks to MARK IV,® our users have beaten the computer room waiting line!"

Founded in 1892, Great-West employs 4,000 people, carries $43 billion in insurance annuities and has $3.3 billion in assets. It is Canada's largest life insurance company in terms of insurance income and the 14th largest life insurance company in North America in terms of total insurance in force.

"As the methods of storing and manipulating data become more varied and complex, the need for easy user access to this data has increased. Even though our 370/168 attached processor with MVS operating system gives us substantial computing power, and we have over 100 programmers and analysts, the company's demands on these resources are tremendous. User requests create an ever-extending queue because we simply could never do all they wanted us to do.

"With MARK IV, our users can get the information themselves, often in quite sophisticated ways. Thanks to MARK IV, they've learned how to avoid the programming waiting line. And from the feedback I'm getting, they're very pleased with this new environment!

"MARK IV has also had an impact in our Computer Systems area. We have developed some complete systems, using the many powerful capabilities of the language, such as transaction processing and file coordination. Even though the programmers were relatively inexperienced with MARK IV, they indicated the development times were considerably shorter with MARK IV than with PL/1.

"Most programmers show resistance to a new tool like MARK IV, but once they have used it, they come back to tell me how much they like it. It's the thrill of getting results!"

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VISIT INFORMATICS AT THE CANADIAN COMPUTER SHOW IN TORONTO NOVEMBER 28, 29 AND 30.

Package Helps Purina Analyze Market Forces

By P.K. Misra
Special to CW

Ralston Purina Co. is the world's largest producer of dog and cat food and of commercial feeds for livestock and poultry. It also produces many of the products found on supermarket shelves and is engaged in several other businesses. Purina employs approximately 67,000 people worldwide and its total annual sales in fiscal 1977 were $3.8 billion.

The need for a marketing information system led to the purchase in January 1977 of Ramis II from Mathematica, Inc. Before installing the system, we made some basic assumptions regarding our business and information requirements.

Because the consumer products industry is highly competitive, there is a strong need for quick access to all information. In addition, since the useful lives of data sources are unpredictable and modeling and analysis requirements are difficult to project long-term, system development time must be kept minimal.

In view of these assumptions, developing a conventional system was ruled out. Instead, Ralston Purina concentrated on acquiring a package that would give it flexibility.

Desired Attributes

The following attributes were considered necessary to support the projected system: reporting control, summing control, cross-tabulation, graphs and statistics.

Also, compatibility with the management information system (MIS), future growth, user input, table lookup, catalog commands, diagnostics, textural control, IBM compatibility, English-oriented language and interactivity.

> *'Ralston Purina aimed to provide relevant information — in a real-time interactive environment — to its users, while keeping down costs.'*

Also, a dictionary, host language, multifile capacity, security, retrieval logic, secondary files, batch language, summary file, external functions and on-line maintenance.

Ramis II met these requirements and enabled Ralston Purina's Customer Products Group to implement a comprehensive marketing information system that integrates internal and external data in an on-line, interactive environment.

At present, data available through the system occupies almost 300 million characters and comes from sources including: Sami statistics, which detail warehouse movements; MIS sales, which provide information concerning factory shipments; and retail distribution information, which is based on store sales. Other important sources are: progressive grocer data, which provides information on store types and volumes; demographic information; and National Family Opinion Pet Ownership data.

Input from sources such as census data, economic indicators, advertising information and consumer research survey findings may be added in the future.

Two modeling applications — dealing with areas of dominant influence and brand forecasting — have been implemented, but our efforts have concentrated on making information available for quick access and reporting.

Among the reports produced using Ramis II are brand development indexes, dog food competition data, re-

(Continued on Page S/28)

Dear John Letter

See Page 3
(MAIN SECTION)

Are Database Developments Making You Obsolete?

You know that database developments will affect your business and your career. But you can't afford the time to read dozens of database books or go through expensive training. How can you stay on top of this important subject?

Database: A Professional's Primer is a new book written for people like you. It's designed as a direct-access device. Its top-down modular presentation puts database at your fingertips. You won't search endlessly for the information you need. The book is filled with features to lead you to the facts you want, when you want them. Features include

- A control module that summarizes database techniques and vocabulary.
- Three independent submodules that provide in-depth explanations of database concepts, systems, and applications.
- A VTOC (volume table of contents) that covers every topic and subtopic in the book
- Extensive cross-references (linked lists) throughout the book, to lead you to the information you want.
- A comprehensive index (inverted file) that pulls together references to every topic in the book

These features make *Database: A Professional's Primer* simple and efficient.

What Makes This Book So Good?

1 *Coverage*. Up-to-the-minute information about database concepts and systems. Not just theories, but practical facts about these systems, how they work, their advantages and drawbacks — facts you need to make informed decisions

2 *Authority* David Kroenke, the author of *Database: A Professional's Primer* is uniquely qualified He's a computer professional, a database consultant both to computer manufacturers and business He's a successful author — his first book, *Database Processing*, is one of the most readable and popular college textbooks on database Right now he heads a database development team for a major corporation

3 *Readability*. It's not the Great American Novel, but this may be the most readable book on database you'll find. It's carefully edited and clearly illustrated to make database concepts simple to understand *Database: A Professional's Primer* is easy to read, easy to use, and won't waste your time You might read it just for fun — it's that good.

4. *Organization*. Because of its top-down modular approach *Database* can be read in any order. Every module stands alone, so you read only those parts that interest you. Do you need a quick synopsis of a topic? Read the control module. Need more information? Follow the cross-references to in-depth explanations in other modules. The book is flexible, designed to meet your individual needs.

How Can You Use This Book?

For the sake of your career, you need to be on top of database developments. No matter what job you hold — programmer, analyst, manager — database developments affect the whole data-processing industry. *Database: A Professional's Primer* is designed to keep you from lagging behind. Here are some ways the book might be used:

- *Applications Programmers* You're seeking a job in a shop using TOTAL. Your database experience is limited. In order to present yourself in the best light, you need to understand the concepts (and jargon) the shop uses. Reading the systems overview and the TOTAL sections, you'll get familiar with the terminology you'll hear at the interview. You won't be an expert, but you can show how your programming experience applies to the job.
- *Systems Analysts* You must decide whether ADABAS or IDMS would be better for your organization. Before contacting vendors, you read the control module, two sections in the systems module, and a section in the applications module. Now you can ask the vendors intelligent questions (and you'll understand the answers).
- *Data Processing Management* You're the director of a database system. You want to create a new position — database administrator. The personnel department asks you to spell out exactly the requirements and duties of the post. Using two sections of the applications module, you define the position clearly, and improve your chances of getting the person you need.

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Real Value of DBMS Lies in Use, Not Theories

(Continued from Page S/11)

able gives anything remotely approaching "complete data independence." Further, no DBMS currently proposed or contemplated will do so either.

Structure Not 'Infinitely Plastic'

A DBMS can give relatively greater data independence than a traditional tape or disk file. But a DBMS implementation remains a structured collection of data and neither the content nor the structure of the data is infinitely plastic.

Every DBMS — whether flat file with index, hierarchical, network or relational in design — has inherent limitations in its data definition language, data manipulation language and structure that make data independence no more than a matter of degree. As anyone who has struggled with third-form normalization of a relational data base or complex inquiries (to say nothing of updates) in a network DBMS can attest, data independence is a highly oversold feature of DBMS.

Breaking up complex data into multiple indexed files, a hierarchy, a network or a set of relational tables will always require decisions regarding a number of trade-offs. Retrieval efficiency, ease of use, liability to insertion and deletion anomalies, economy of update, flexibility for reporting purposes and ease of maintenance are among the factors that will be affected. A sensible DBMS user should be aware of this from the start.

The theoretical capabilities of an ideal DBMS are not and will not in the foreseeable future be available in a practical implementation.

In fact, network and relational implementations, pretty as they may be from the academic point of view of set theory or of relational algebra, frequently offer no significant advantages in practice over a well-designed hierarchical system and are more costly to run for many applications. There is a big difference between theoretical elegance and practical utility.

DBMS can be tremendously useful. They do give a great deal more flexibility in defining and manipulating data than ordinary file-oriented DP systems. They can drastically shorten the amount of time required to implement computerized information systems and reduce personnel costs for implementation in the process.

With natural language retrieval capabilities, a DBMS can also offer an extremely flexible and powerful means of access to data. Nothing said here detracts from these facts.

A DBMS, however, cannot do everything. It is merely a sophisticated tool whose real meaning is in its use.

Zachmann is technical support manager for CallData Systems, Inc. at the company's Boston offices.

System Teaches Drug Salesmen

(Continued from Page S/13)

viously, if a person is going to 'walk in the shoes' of a physician, he's going to have to prepare himself," and we have a number of courses designed to do just that.

"Our field force data base, which we access with DMS II, helps us determine which salespeople are eligible to attend a particular clinical rotation program at a given time," Braden said. "Another important benefit from our system is our ability to document the training and experience of our field sales force."

Braden pointed out a number of benefits from Mark III. First, he commented on reliability. "It doesn't matter where or when we want to use the system, it's available," he said.

"System versatility is also important, as our company and department continue to grow. Today, our data base, interactive testing and AQP may completely meet our needs. Tomorrow, however, we may suddenly discover that we have a new requirement.

"When this happens, we don't have to discard what we already have. We can add to the system by calling in GE Information Services personnel," Braden said.

"Our service from GE has been excellent," he continued. "If we should require special programs, we know the Custom Applications Operation is readily available. This type of service is essential to us, since we are not DP experts."

Kleiner said Roche Laboratories will be seeking more field applications for its system in the coming year. Every division in the country will have a portable terminal to help sales representatives with on-the-job training at work and at home," he said.

Braden concluded, "The applications for our system really seem unlimited. I'm sure we have only scratched the surface of the capabilities we have for data profiling of our human resources."

SEED ON
PDP 11
page S/24

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Increases Security, Control

DBMS Regulates Medical Center Business Data

NORTH BEND, Ore. — A terminal-oriented, general-purpose business computer and a data base management system (DBMS) have combined to form a powerful business tool for the North Bend Medical Center here.

The center houses 20 doctors in separate offices, as well as an X-ray and blood lab. More than 200 people per day visit the doctors, including 10 first-time patients, who must be registered prior to treatment.

Tasks performed at the center include patient billing, insurance reimbursements, medical supply purchasing and distribution, as well as payroll and personnel administration for the doctors' staffs.

Prior to the installation of its system, the center handled all of those functions through a service bureau. All daily transactions were entered on a remote job entry (RJE) station and then batched into the service bureau's system at night.

Once the data was transmitted, the service bureau sent back a listing of transactions as verification of receipt.

Problems Ensued

This type of business processing became cumbersome as the patient and insurance carrier billings multiplied.

In addition, the charges for processing larger volumes of data grew.

The clinic's administrative staff found it harder to control the clinic's day-to-day business. To receive a report on insurance company payments for the year required a special request to the service bureau.

Often, several weeks passed before the service bureau could run a program against the clinic's data, if that type of program was even available. As the need for special reports grew, DP costs increased.

Opts for In-House

Early in 1978, the clinic's board of directors decided it would be a good idea to bring the DP functions in-house. In June 1978, the medical center installed a Hewlett-Packard Co. HP 3000 Model 6 system with 384K bytes of memory and 100M bytes of disk storage. The computer and the applications software were supplied by Umpgua Data Factory (UDF), an Oregon-based systems house.

"The applications software package supplied by UDF is called Patient Accounts Receivable and Insurance (Paris)," Don Conner, the center's director explained.

"With this package, which is based around HP's DBMS — called Image — we are able to register all new patients on-line.

When service charges start to accrue after registration, the clinic already possesses the information necessary to monitor patient treatment, insurance claims and personal patient billings. We process 2,000 to 3,000 such transactions per day, not counting account status inquiries," Conner pointed out.

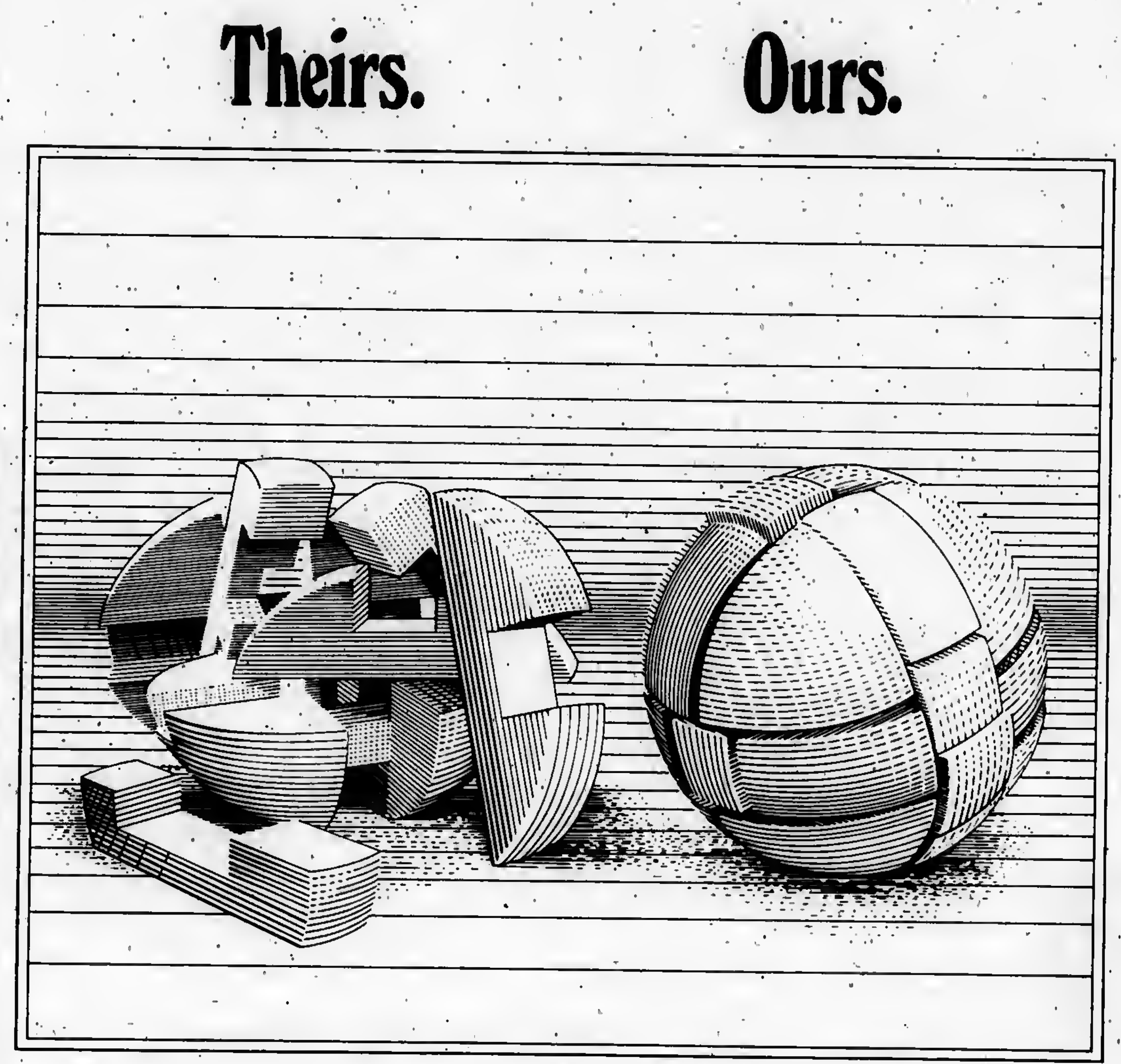
Query Assists

"Another major management tool is HP's Query. With Query, we can search the patient data base and produce exception reports without writing a program.

Query responds to English-language commands such as FIND, LIST and REPORT.

An example of the control Query gives us is in cash flow monitoring. We receive payments from many sources — patients, welfare, federal agencies

(Continued on Page S/29)



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Third Age of DBMS: Turning Back to the User

(Continued from Page S/20)

But the fear went deeper. The designer had barely kept afloat through the waves of shifting requirements and rewritten specifications. If his trusty craft now took a new form every six months and, if its operating manuals were growing exponentially, he was in real trouble.

Clearly his first duty was to his own continued existence. If he wasn't captain of his own ship, he was lost for sure. Thus data independence was born.

Imaginary Computer

What the designer did was simply make up an imaginary computer. Call it a data model, a data definition language, a conceptual schema or a Codasyl standard, the result was the same.

Now, rather than having to build his boss' data castles with some far-off electrical engineer's blocks, he could play with his own blocks. The heat was off. "You give me these blocks and I'll give you that castle," he could say.

> *'Third generation data base management software will provide the user with the tools necessary to bring substantive knowledge to bear on the act of computing itself.'*

And he looked forward to quietly sitting at his desk and playing with his shiny, new blocks. But meanwhile, a very different thing was happening.

Given new kinds of blocks, people will build new kinds of buildings. The arch had to wait for the keystone and the cantilever for prestressed concrete slabs.

It doesn't matter that the blocks are imaginary, the building will go on. Real buildings are engineering details.

But building with second-generation software blocks is already going on in some very real ways as well as some largely imaginary ones. Under the guise of knowledge, engineering and heuristic programming, third-generation DBMS are taking some substantial first steps.

Designers of these fledgling systems have turned away from the machine and back to the user. This time, rather than trying to render the data structures they see, they are trying to get at the reasons behind the construction of these structures.

The question to the user is not "What are you doing?" but "What do you want to do?" — a far more penetrating approach.

"What I am doing is sorting the records of file Alpha5.Data.H5900. What I want to do is find out if there is more lung cancer in New Jersey than in Wyoming." The difference is fundamental.

Second-generation data base management software is, as we have already noted, machine-oriented. The First Article of Faith of second-generation design is that any human data handling process can be closely approximated by one or more machine data-handling processes.

The actual construction of the approximation is, of course, left as an exercise for the user.

There is a reason that kits cost less than the finished product. They're even cheaper without assembly instructions.

Goal-Seeking Activity

To some extent, however, this problem must be left to the user. Assembling basic machine processes into a useful human process requires knowledge of why the process is being put together in the first place.

It is a goal-seeking activity whose success or failure can only be measured in the context of the problem at hand.

The bottom line is not five quick sorts, three fast merges and a state-of-the-art file inversion but a concise comparison of the lung cancer rates in New Jersey and Wyoming.

Users of second-generation software have no way of embedding context-specific information into the process part of a DBMS. They can use contextual information to build efficiency into the storing of the data but not into its handling.

Third-generation data base management software will open the door to this treasure trove of computing economies. It will provide the user with the tools necessary to bring substantive knowledge to bear on the act of computing itself.

Analogous to today's data models which contain important information on how to store the data, we will find procedure models which can be primed with substantive information on how to process the data.

The emphasis in third-generation data-base management will be on context-sensitive computing. The user will automate not only the structures from which the data are taken but also the techniques used to manipulate these structures.

Second-generation data base management software gave us data independence. Third-generation software will give us procedure independence.

This independence has been and will continue to be gained by moving away from the machine's reality and into the data's reality. The question of what reality the data is connected to will always be up for grabs.

Guthery is a partner with tiny-c Associates of Holmdel, N.J.

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College Builds Student Information Data Base

(Continued from Page S/6)

the batch system, the chaining pattern shown in Figure 1 was used. Nine detail data sets were linked to the student master data set (Sismast) through student number. Some of the detail data sets were also linked to other master data sets through other key fields.

One example is the ACT-QTR data set, which was the set of all student/section records. It was linked to the master schedule of classes through section number and contains the student's identification number, name, date of transaction, section number and grade. This was the only occurrence of the student's name outside the Sismast data set and was there only to improve the speed of processing data for student inquiries and class rolls.

In order for a student to register for a class, or pay fees, or purchase a parking decal, etc., data on him must first be entered into the Sismast data set. From that point on, all references to the student are based on data in the Sismast data set, a single source for all data.

The factors that helped the college implement a student information system data base with on-line access were:

- Interactive program development. This increased the productivity during the development phase and also permitted some needed modifications of the system during the operational phase.
- Data base management. The Image/3000 DBMS is a useful means for maintaining and controlling data. Various terminals scattered throughout the campus and off-campus share exactly the same data from a single student registration data base. All the information which is shared is kept up-to-date at all times.
- Time-sharing. This permits simultaneous use of the central computer by many users at the same time — a necessity during registration.
- Data security — This permits a regulated access to private data at all levels from individual items to the entire data base.

Gholson is director of academic computing services at George Mason University (GMU) in Fairfax, Va. Before coming to GMU in July, he was director of computer services at Walters State Community College for five years.

Plans Can Reduce Risk

(Continued from Page S/17)

DBMS is added to the overall cost of bringing their DP into the 1970s.

In any case, the budgetary ax can fall heavily on a DBMS installation effort when the cost analysis fails to include all expenses related to the DBMS aquisition.

One analysis that is most often missing from a DBMS plan is a discussion of what it will cost the organization not to go to that DBMS. The figures are not always that concrete or that easy to obtain, but the total cost of conversion cannot be justified without some idea of the business trade-offs.

Depending on what the data base means to the company, lack of a DBMS may mean loss of business, higher personnel costs, marginal effectiveness in planning or reduced profit. If the cost of acquiring a DBMS exceeds the cost benefit to the company, then the need for it has not been proven, and serious thought should be given to abandoning the project before any purchase is made.

Kubilus has been involved with data base management for over seven years as a user, implementor, manager and educator. He is currently manager of corporate support services at Rapidata, Inc. in Fairfield, N.J. He is also an Association for Computing Machinery national lecturer.

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page S/24

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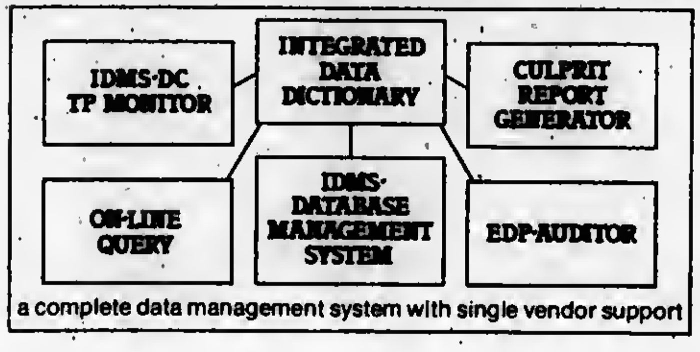

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Purina Gains Quick Access to Marketing Data

(Continued from Page S/21)

tail sales customer status and distribution reports and multiple-item distribution analyses.

In addition, Ramis II systems have been developed for Market Research Department: project management, budget control and advertising research.

Ralston Purina aimed to provide relevant information — in a real-time interactive environment — to its users, while keeping down costs.

Its justification for acquiring Ramis II and building a marketing information system around it was based on a number of cost considerations: development effort savings (a conservative estimate of 2:1 was used), time-sharing savings, external reports savings, clerical effort savings, the cost of Ramis II, the cost of Ramis II maintenance and internal computer usage costs.

Annual benefits were estimated at $100,000, but actual results are well above initial projections. Moreover, it took only an average of nine man-days to develop each of the 15 Ramis II projects completed to date.

Before selecting Ramis II, 20 packages were screened; benchmarks and vendor presentations were carried out for five of them. Several visits were made to users in various parts of the country to gain from their experience. Ralston Purina's market research people were direct participants throughout this selection process.

Planning, by its very nature, requires flexibility. In today's competitive environment, it is almost imperative that marketing management have direct access to needed information.

It is to this point that we addressed ourselves, using an evolutionary approach, and we expect progress to continue, with more integration of different data sources and use of the system by new departments and divisions within the company. In fact, Ralston Purina is currently setting up prototypes for using the Ramis/IMS interface in other areas.

Misra is manager of planning systems at Ralston Purina.

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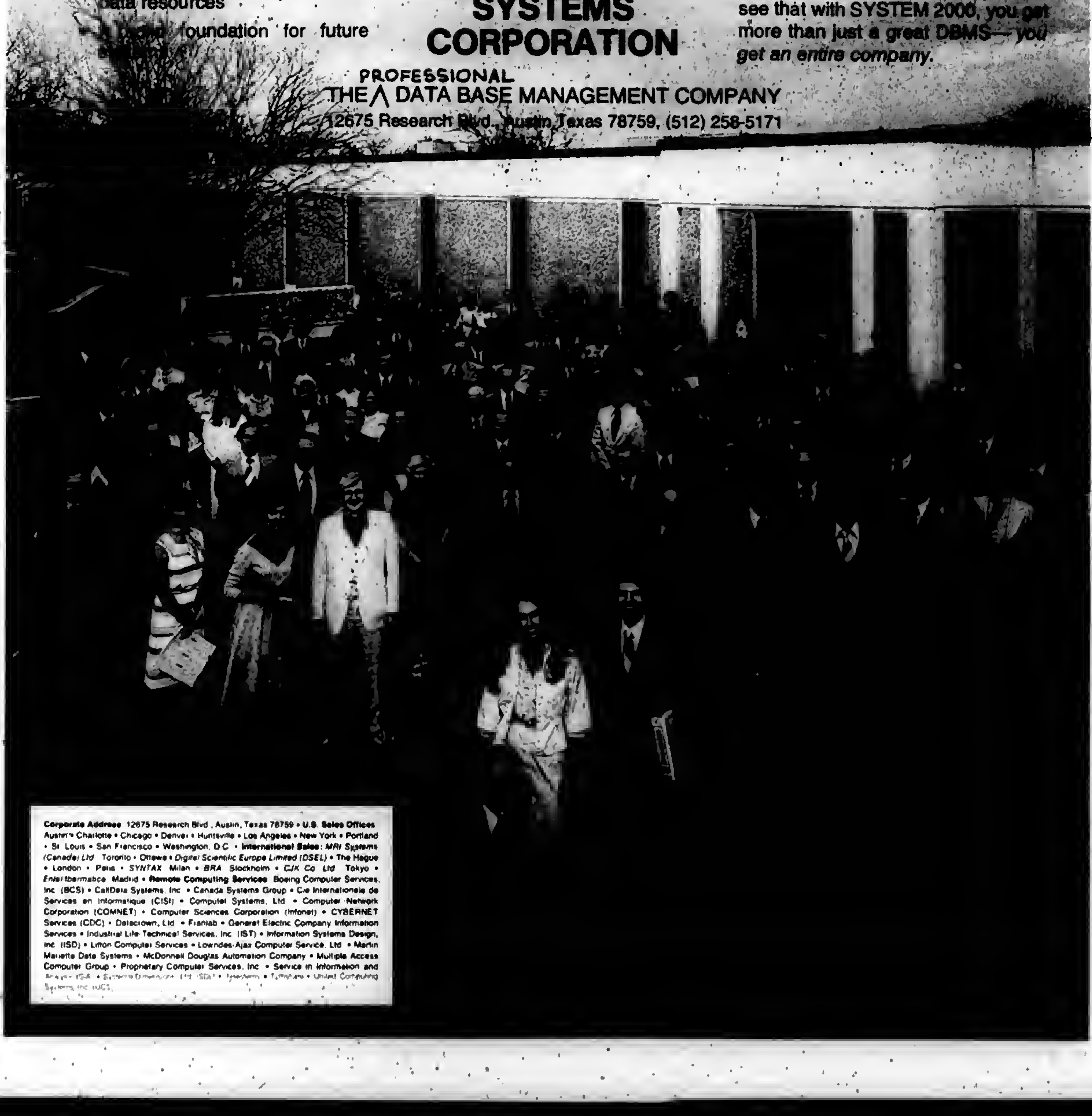

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Helps Control Business Functions

DBMS Becomes Powerful Medical Center Tool

(Continued from Page S/23)

and insurance plans, Conner explained.

Query can report the total amount received in each of these categories and even average each category's individual payments. In a matter of minutes, we can identify the sources from which the clinic is receiving its funds. In addition, using Query, we can predict what our payables are for the week and compare the estimate against the cash received.

The way the Image data base links the data also allows us to see how much of the incoming funds belongs to each doctor, Conner continued. Query allows us to report how much income is being earned by each office."

Accuracy From Image

"The heart of the Paris package is Image," Jim Wilkinson of UDF commented. The combination of Image's network structure and security system enabled us to use the same information for different functional groups in the clinic, as well as relate data in different logical ways for reporting purposes, Wilkinson noted.

As an example, once a patient is registered at the clinic, that master information is available to the attending physician and the business office. We do not have to carry a patient's name, address and telephone number in three separate locations. This results in less disk space usage and also makes for better data integrity.

For example, when the patient moves, the clinic only enters one change of address transaction. The new address is now available to the business office and the patient's physician. According to Wilkinson, we never have the problem of carrying two addresses, one of which is out-of-date.

Security Aspect

"Another factor about data base management is the security aspect," Conner added. "Since we operate in a service bureau environment for all of the member doctors, the board of directors was most anxious about data security. However, Image maintains a security system that helps us control who is allowed to read data and who is allowed to modify it.

Image treats each individual data field as a separate entity. If a user attempts to look at a field of data, Image checks the user password to see if the user is allowed to read the data. If the user attempts to modify a field, Image checks him for write access.

We can allow our clerical staff to look at patient data but prevent them from changing it. Just because a lot of data is linked together by pointers does not mean it is accessible to everyone. According to Conner, this is a large step in maintaining the necessary confidentiality of patient records."

Programming Viewpoint

"From a programming point of view," Wilkinson explained, data base management gives us considerable data independence in the support of Paris. In the future, the center's information requirements may need to be adapted to changes in business practice, government regulation, or for some other reason.

This could cause additions to the number of data items in the data base. To accommodate, we would only modify the programs which access the new fields of data. Any programs which do not relate to the new data would be unchanged, Wilkinson noted.

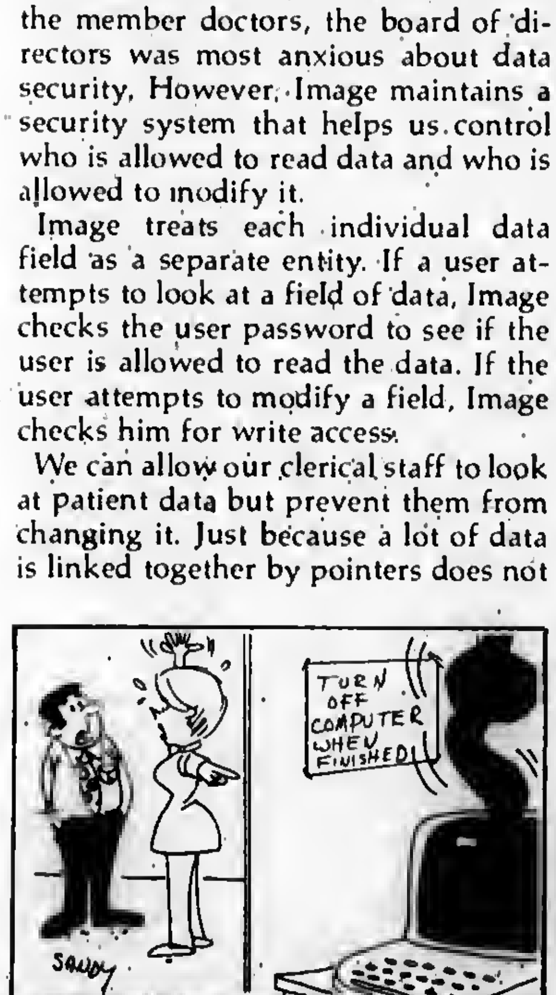
Image allows us this freedom because it manipulates individual items of data, not the entire data record. A program retrieves only the items of data requested. The fact that more fields exist in a record than the program wants to handle is dealt with by the Image software, not the application.

Cost Savings

An application program requests and receives fields of data in any order desired, regardless of the physical order of the data in the data base, Wilkinson pointed out. "Images handles the deblocking for you," he said.

"We see cost savings everyday," Conner concluded. "Not only do we bill and submit claims in a more timely manner, but the entered information is more accurate and up-to-date. Inquiries about patient status are handled quickly using on-line terminals.

The final payoff is the control achieved by management. Query reports are available in minutes as opposed to days. Information is secure, yet it is readily available, the security and control over patient data is worth the price of our investment in a DBMS," Conner concluded.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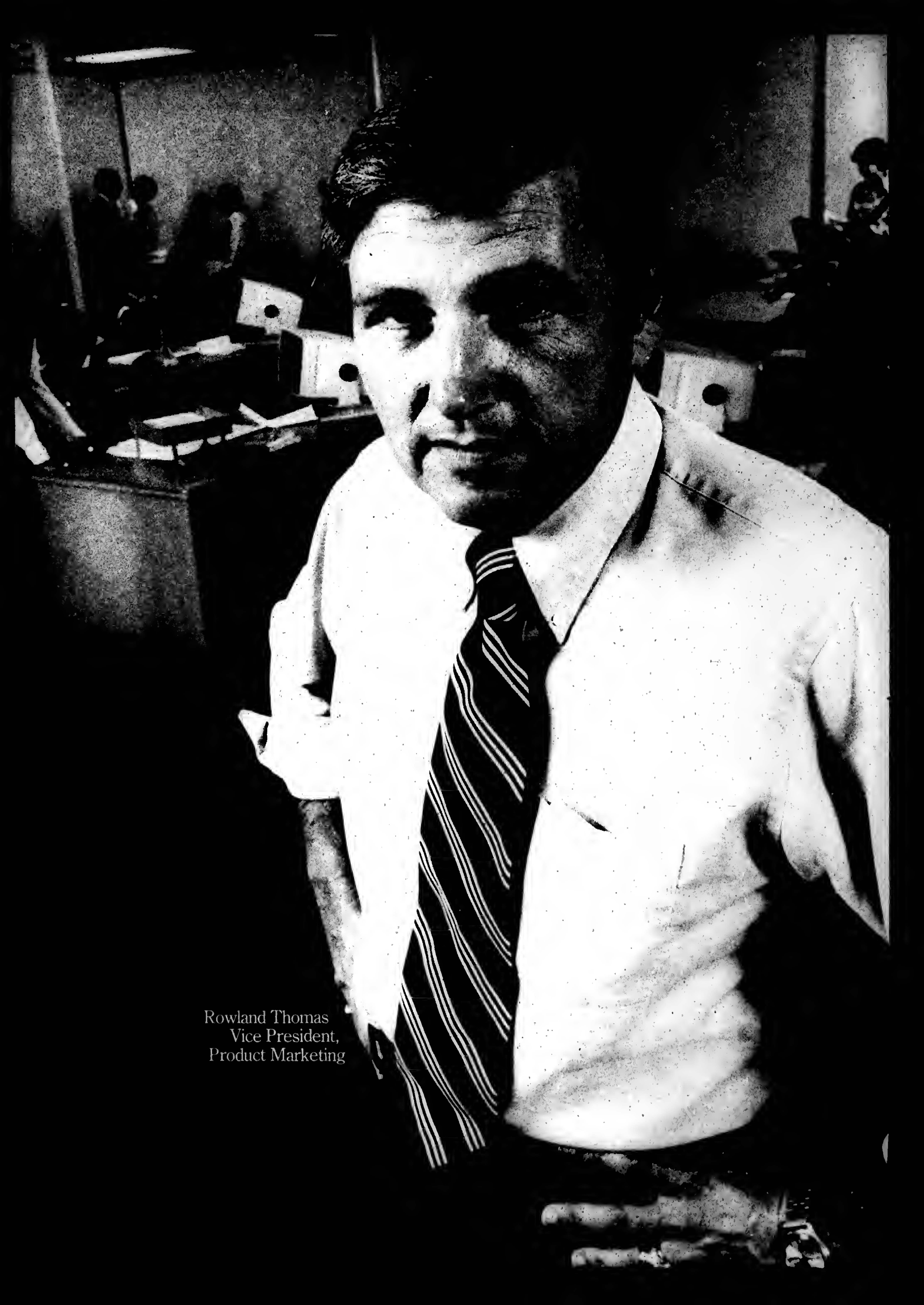

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Transborder Data Flow: Should It Be Regulated?

At a recent forum in London on transborder data flow, Jan Freese, director-general of the Swedish Data Inspection Board, and Rossiter W. Langhorne, vice-president of the Manufacturers Hanover Trust Co. with responsibility for its International Information Support Group, presented strongly conflicting views on whether the movement of personal and commercial information across national borders should be restricted. Because of the growing concern about this issue by multinationals and the U.S. government, Computerworld *asked Freese and Langhorne to present their views.*

PRO

By Jan Freese

The analogy between the rules governing international air transportation and the regulation of data flows between countries makes a great deal of sense to me. Similarly, another meaningful parallel is the comparison of time-shared data banks with their little black boxes containing all sorts of valuable information, whose activities have been controlled for centuries.

International data traffic, carrying economic products and services, should be considered for what it is — a part of the commercial relationships among nations. This is the starting point many Europeans use in approaching data flow questions, and I would hope Americans would see it in much the same way.

The term "data regulation" should not shock and anger businesspeople, nor should the legislation it often entails be a hobbyhorse for lawyers and bureaucrats. There must be a demand for regulation, either by citizens or as a necessity to protect them from problems they do not realize exist.

In Sweden and many other European countries, there has been a demand for regulation — and there still is. Last year our National Bureau of Statistics conducted a survey which showed that Swedes rank privacy protection as the third most vital issue facing their lives — after inflation and unemployment — but before other kinds of social welfare programs. I believe there are many reasons to look upon privacy as a part of social welfare.

IN DEPTH
IN DEPTH
IN DEPTH

Regulations do not always have negative effects. Let me remind you of what happened when the car first appeared on British roads. Responsible persons decide one had to have a man walking with a red flag in front of this monster in order to warn people and horses. This rule was in force, I believe, for 20 to 30 years. Then it was abolished because the car could go faster than the man.

What did we get instead? Some of the most extensive and often very bureaucratic legislation.

Most of us, including those running computers at speeds faster than man ever could process information, accept society's demand for yearly car controls, rules about antipollution devices, licensing of drivers, speed limits, security equipment, limitations on vehicle size and penal codes for drunk drivers. Such legislation has become as natural to us as many other laws without which we cannot live. Traffic legislation has often been changed drastically and suddenly.

Is it not better to accept some rules now which can help us to develop computerization in a positive way, instead of that kind of legislative approach?

What is it that makes the computer so interesting and problematic? Its a tool like many others, a baby of *one* modern technology among many others. Man has acquired many new tools without making so much fuss as with computerization.

This fantastic tool is beyond comparison to anything in our history. The computer propels us into information societies in different ways than did the printing press.

Printing gave the man in the street an opportunity to learn to read and write. Computerization has instead made a lot of people "illiterate"; at the same time, society has gained privileged groups of information-rich specialists.

Computerization has a tendency to marry other technologies, such as telecommunications. That marriage has meant a revolution, an information explosion. Never before has it been possible to store such immense quantities of information; today one can even do so on other continents and retrieve and process it at home.

Many believe the development of computerization is far from at an end. What we face today is not even the beginning of the end, perhaps not even the end of the beginning.

No doubt computers have given society that rather common disease called growing pains. In many countries, those who have the political responsibility feel, as they often do, that the fast development of this technology cannot be allowed to continue without some reason, purpose and order. Many times before man has faced a new age almost without noticing it. Even if a new age developed very slowly compared with today, printing and other inventions became future shocks.

Many believe modern society cannot afford such shocks. Even if the means of coping with situations today are better than in the past, it is not easy to be sure that we are doing the right things when we try to pilot the development.

The computer itself may be neutral, but its effects on privacy and the risk of misuse, breakdowns, data trespass and other consequences change this information treasure to something else.

This discussion started with the privacy question, which already has led to legislation in several countries. These laws mean new barriers to the international flow of information. The flow has in reality not been totally free, but a balanced flow, and we have to be careful to maintain that bal-

(Continued on Page 64)

CON

By Rossiter W. Langhorne

Considerable discussion and editorializing has taken place this year about transborder data regulation, with the spotlight on individual privacy. Individual privacy is, however, only part of the issue.

One would hope that everyone would acknowledge the necessity and validity of ensuring and protecting the rights of individual privacy. In fact, we would all endorse our entitlement to privacy many times over.

Based on what has transpired in the U.S., Canada and a number of European countries to date, it seems data protection laws of varying magnitude will be enacted in many countries in the not-too-distant future. However, such legislation may well encompass much more than the protection of information related directly to individual privacy.

Although we are now witnessing the emergence of only the first generation of data protection legislation, it is not too early to perceive some of the problems posed to the private sector — problems compounded for the multinational company — by different views and different laws. The following statements are quotations from the May 1978 issue of *Transnational Data Report:*

"The proliferation of national regulations, even though these are inspired by the right motives, may, if they are not properly harmonized, have the result of inhibiting the desirable development of information. National regulations which are overscrupulous to a greater or lesser degree may, at worst, be diverted from their specific purpose and *constitute barriers to trade* . . .

"All these problems clearly call for international cooperation . . . International cooperation is the only means we have of resolving the contradiction that exists between a phenomenon which tends to take no account of boundaries on the one hand and, on the other, national sovereignty."

In discussing the basic issues, "one national figure put the job of [the Organization for Economic Cooperation and Development (OECD)] this way. It's not a question of whether the OECD, Council of Europe or European [Economic] Community [EEC] are first to prepare an agreement on cross-border flows of personal data. The real issue is whether a floor of operational principles can be placed under this activity, and soon; *otherwise national laws will become large constraints on the free flow of data.* If there is a race, it's to set down the cellar before a crazy quilt of a house is fully constructed."

Addressing IBM's position paper, in a statement by Louis Joinet against the extension of data protection legislation to cover legal persons (companies), the first argument is a *legal* one:

"Without explicit reference to the concept of 'the privacy of legal persons,' the courts take the view that there is 'a legitimate legally protected interest.' The second argument, an economic one, should be taken more seriously. There is, firstly, the fear that *skillful use of the right of access granted to legal persons will distort competition."*

Further, an article in the June 1978 issue of *Transnational Data Report* noted that an eight-year process of preparing and exacting a Personal Data Register Act in Norway has been completed . . . Norway is the first to give legal persons (companies) rights to inspect their records maintained by banks, clients or even competitors."

In looking at the Swedish Data Inspection Board's licensing trends as they have affected the banking sector, "one major issue is the way the Data Act functions with respect to emerging special-purpose networks, as for instance the Swift interbank network. The [Data Inspection Board (DIB)] gave banks a general dispensation for transferring personal information for processing abroad in a decision of May 1974, as far as the disclosure is part of a transaction carried out on behalf of the person concerned. However, disclosure for *central* registers abroad, for instance for interbank clearing purposes, was excepted from this dispensation. This exception was applied to Swift.

"In a decision of 13 April 1976, a major bank applied for license to join the Swift network, and in its deliberations the DIB stated:

" 'The nature of the transactions and the processing in question, the limited time of storage of all transactions and the very rigorous security measure planned or announced justify the opinion that joining the Swift network will not create risks for the infringement of privacy.'

"A license to join the network was granted and later another major bank got a similar license (decision of 8 November 1976).

"A rather liberal decision relevant to banking was made 15 September 1977 in respect to an application of a major bank to process part of its files abroad. The bank was redesigning its computer system and wanted for a limited period to process deposit transactions abroad. The information included mainly information on legal persons (foreign banks), but also a small number of individuals.

"The information was transferred to a subsidi-

(Continued on Page 69)

IN DEPTH
IN DEPTH
IN DEPTH

(Continued from Page 62)

ance.

Computers are not an exception to regulation. Looking into other sectors of technology, one finds much legislation to protect citizens or society or, let me say, the administration of society in the interest of the citizens.

Let's face realities: we manufacture cars that can be driven faster than speed limits allow. Regulating other technologies is, however, not a reason by itself to regulate computers; legislation should not be used for unnecessary reasons and should not be used to solve problems before they occur or to cure growing pains.

At the same time, computerization will probably kill some old legislation. How soon will the UK's Prestel force us to attend the solemn funeral of copyright?

It is troubling that many of the concerns expressed about the vastly increasing transborder data communications, which are part of the Swedish, German, French, Danish and Norwegian data acts as well as in other national proposals, seem to challenge the principle of the free flow of information among countries. There doesn't seem to be anything free of charge about computerized data banks and the communications systems which collect and disperse information these days.

The technologies which are making possible the important advances in all our countries come to us at a certain cost — economic as well as social. In a way, we later receive an extra bill, charging us for the costs of dislocation and security. The negative impacts must be fully evaluated against long-standing principles.

I believe there is little disagreement over the need to preserve the free exchange of ideas and knowledge. We oppose political censorship and uphold the ideal of unhindered personal communication among all peoples.

If our discussion centered on press freedom; rules for broadcasting satellites or television and film distribution practices, it would be more closely related to the free flow principle. But setting up electronic data networks on land or via satellites comes under the trade and commerce jurisdiction of sovereign countries.

Protection of personal data which relates to human rights is but a small part of the complex economic and political questions which have emerged.

The appropriate issues to be raised, it seems to me, are those of *access* by companies to their affiliates, to clients, to processing services and to documentation and knowledge centers and the *reliability* of those links for continuous and secure operations. Reports which are appearing on tampering with microwave communications and the ease in disturbing satellite messages should make the safety of international networks one of our highest priorities.

Data protection is deeply rooted in the need for a legal regime operating reciprocally among countries or under an international agreement which ensures that personal information will be treated according to generally acceptable practices.

We should also probe the topic of access in terms of competition and an open market place for "data trade." This has basic economic characteristics; the most troublesome may be nontariff barriers which would reduce the normal growth of international communications.

The Vulnerability Issue

There is more to the access issue, however, in terms of the impact on government requirements to protect its national interest, security and integrity. In Sweden we refer to this as economic defense, which is to be protected in parallel with military defense considerations..

An expert committee with representatives from business, established by the Swedish Cabinet, has been working on the topic "The Vulnerable Computerized Swedish Society." It was not the primary purpose of the project to consider war-time dangers to computing systems, but acts of terrorism, sabotage or civil war which could jeopardize data in Sweden or anywhere in the world.

Some of the threats which were examined were:

- Risks to computing from lack of cooperation or public confidence.
- Breakdowns such as strikes and power failures which alone can slow

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- Lack of manual routines to back up computers, because training is no longer given and paper forms are no longer printed.
- The dependence on continuous operations as a result of centralization.

A preliminary report of this committee was recently issued. The committee concluded that vulnerability is unacceptably high because of several factors: dependence on foreign sources, concentration, staff dependence and the risks associated with certain types of register content.

Emergency plans where they exist are inadequate. In regard to the causes of present computer vulnerability in Sweden, the report asserted this is because "there has been no government control over the development which has led to a highly computerized society. There has been no overall assessment of the risks entailed in the entire field of computerization . . . No such overall assessment has been made for the government service sector, even less for the country as a whole."

It should be mentioned that the Federation of Swedish Industries has officially asked for protection of legal persons in a computerized society.

The committee said the first step in counteracting vulnerability is attempting to attain a general consciousness of the problems involved. Overall guidelines for computer users from the government are necessary to come to grips with these threats.

In regard to the dependence on foreign sources, the report indicated it may be worth considering whether this can be limited, for example, by Swedish engagement in certain products which can now only be obtained from abroad. Better provision of spare parts could be achieved through agreements with suppliers; a Swedish service industry would probably contribute to limitation of vulnerability.

Addressing processing operations abroad, the committee said it is in the Swedish interest that these do not take place entirely without control.

I hope the important points made in this report will be taken into account when people outside Sweden attempt to understand our overall concerns.

The Data Act

I have heard on one hand that the Swedish Data Act is a paper tiger; on the other, that it has the power to block society. Let me make this general statement: The Data Act was designed to structure computing and the wishes of Swedish citizens in order to find acceptable points of balance.

The first piece of nationwide legislation protecting personal privacy, the act became fully effective in 1974 (I have worked with it since its inception in about 1970).

A Data Inspection Board was established to grant licenses to the keepers of personal files and to monitor compliance with the act. Anyone who wishes to set up a personal file must first obtain permission. A license is granted if there is no reason to assume that undue infringement of the registered person's privacy will arise.

The kind and quantity of personal data entered in a file, as well as the treatment of the file in the application of the data, are factors of especially great importance in weighing the risk of undue privacy infringement.

So far the board has received more than 21,000 applications pertaining to about 25,000 personal files. On an average, the name of every unmarried and conscientious Swedish adult appears in at least 100 personal files.

The number of applications and the stringent rules of the Data Act may evoke images of a vast bureaucracy, but in the space of about three years following the start-up phase, we have promulgated nearly 20,000 decisions with a small workforce.

The board has deliberately sought to avoid bureaucracy. Most decisions are routine; only perhaps 40 important decisions a year are made by the full board.

I think most of the fears of those outside Sweden have now been allayed. On a practical level, we have given everybody information from our experiences. At least everybody has been able to learn from our mistakes.

'Golden Rule of Data'

Transborder flows of personal data are specifically dealt with in the act. Section 11 states:

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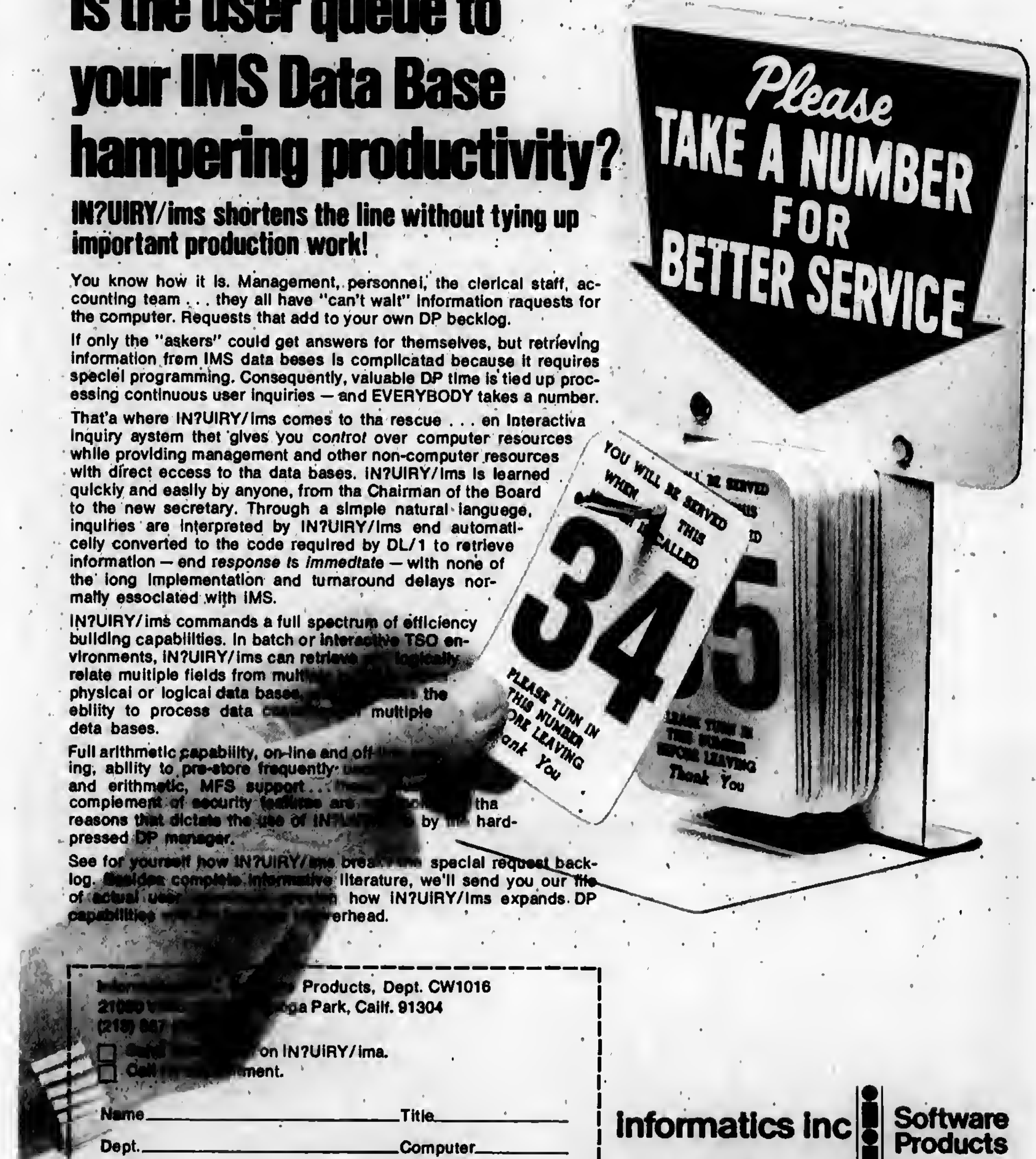
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An item of personal information included in a personal file must not be disclosed if there is reason to assume that the item may be used for data processing contrary to this act. If there is reason to assume that an item will be used for data processing abroad, it may be released only after special permission has been granted by the Data Inspectorate. Such permission may be granted only in cases where it can be assumed that the disclosure will not entail undue encroachment on privacy.

I do hope this section soon will be replaced by an international agreement.

In a real sense, this section asks for a "Golden Rule of data" — that data sent abroad will be treated the same way it is at home. We have had to deny requests for licenses to send personal data abroad when we could not feel confident of adequate reciprocity, either by the organization receiving the data or because of the absence of public law protecting the data or providing penalties for its misuse.

It has been suggested at some international meetings that it does not matter where data goes once it leaves its country of origin. But it does.

In connection with personal data, the board has learned that information was given to a foreign country and the result was abuse, out of our control, in that foreign country.

There are other kinds of experiences as well. Some multinational companies operated in Sweden by local managers are not always happy that their parent companies ask them to send on tape all information about their employees.

There is also a decision by our Supreme Administrative Court stating that there is no reason to stop information wanted by a company in another Nordic country. As far as I understand from what is said between the lines, in actual fact the information would not have been allowed to be exported to a dictatorship — or even a country from which many people have emigrated to Sweden.

I believe this is a government responsibility, and public confidence in transborder data flows is based on knowing by whom and where data is stored or processed. To put it toughly, would you buy computer services from Ugandan President Idi Amin?

Data Policy

The outlines of a Swedish data policy are now coalescing, and privacy is but one element. It's a central concern, but there are at least five interrelated parts. Including vulnerability issues, the following should be included:

- Effects of computerization on employment and the working environment.

At a Cabinet meeting in July of this year, the Minister of Labor proposed the establishment of a Commission on the Effects of Computerization on Employment and the Working Environment. It was approved and the commission will be set up shortly. Let me refer to a few paragraphs from the Minister's statement:

"In industry, computers are being increasingly used in various production processes. Automation is regarded in all industrial countries as an important means for increasing productivity.

"Computers are used for process control in, for instance, the paper, steel, cement and chemical industries. They are used for control of production lines in shipbuilding, automobile, mining and printing industries.

"Computers are also used in conjunction with numerically controlled machine tools. They are an important basic component in industrial robot systems.

"Semiconductor techniques, furthermore, have found growing applications in measuring and control equipment in industry. The quantity of small computers has rapidly increased.

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See "Data Communications Networks" in our November 27th issue.

Time was, the data communications user had a limited choice between using the public switched telephone network, or leasing private lines. But recent data communications developments are rapidly allowing the user to configure more flexible networks, with greatly increased transmission efficiency, and easy interfacing of terminals and computers to the network.

Computerworld's November 27th Special Report takes a close look at data communications networks, and how they are rapidly making distributed processing technically feasible (as well as affordable). Edited by Ron Frank, *Data Communications Networks* will examine standards for evaluating and establishing effective networks, with articles by vendors and users on design, control and maintenance of the various available networks. We'll also be talking about:

- *Terminal selection — getting the most work out of the right terminal.*
- *Private line vs. public data networks — how users can best utilize either [or both] systems.*
- *Switched networks — choosing between circuit switching, message switching, and packet switching.*
- *Configuring in the '80's — microwave transmission and satellite links.*

Whether you're presently involved with data communications, or just looking, our November 28th Special Report will be of special interest to you. And if you market data communications products or services — this is a good place to get the word out. Ad closing date is November 10, and your *Computerworld* representative can give you all the details. Or, to reserve space, call Terry Williams at (617) 965-5800.

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"Some attempts have been made at quantitative assessment of the various effects of computerization on employment. Some calculations have indicated that a loss of job opportunities was taking place in employment in the office sector, but we now find there is an increase instead.

"It is nevertheless probable that, at many places, computers have reduced the need for office staff. Unless the service sector continues to step up its total employment as rapidly as heretofore, computerization in the office sector may lead to greater problems of unemployment.

"In other sectors such as the graphics industry, parts of the communications field (posts, communications, shipping, railways) . . . the introduction of electronics has meant that certain occupational groups now seem to be disappearing. In manufacturing, industrial robots may soon replace the work of many people. The effect automation may have in the future on industrial employment is, however, little known.

"The commission will examine these developments, in particular the effects of computerization on employment, for different possible courses of future technical and economic development. It will consider the need for education and training of different occupational groups and for differing labor market policy measures.

"The commission should also analyze the various effects on the working environment that computers and automation may have. It should also consider the effects of computerization on the flow of information in business enterprises and public administration and on the employee's possibility of upholding their right of co-determination and, in that light, what measures may be needed on the part of the state to improve the working environment."

- Effects of computerization and electronics on the development of industry and commerce.

The Swedish Cabinet, also in July 1978, authorized the Minister of Industry to appoint a Commission to Investigate the Effects of Computerization and Electronics on the Development of Industry and Commerce. Here are two paragraphs describing its functions:

"The commission should first establish the extent to which industry, commerce and public administration use computers or other equipment for advanced automation. In a second phase, it should attempt to judge in what fields and in what time perspectives the use of a new technique appears to be technically possible and economically advantageous.

"The commission should consider whether and in what form measures should be taken by the government either to stimulate a greater and more effective use of this technique or to improve the means for predicting and preparing for the changes that may be necessary."

- Computers in government.

A top-level consultative group for computer questions, chaired by the Minister of Budget, was formed last year to determine the need for improved control and coordination. This may take the form of assistance in planning long-range goals when computing is introduced, encouraging decentralization, taking advantage of small computers and paying greater attention to interests of citizens affected by DP systems. This commission is due to report its conclusions in a few months.

The findings made in these areas of data policy will no doubt affect our international outlook. But by examining these issues and reaching solutions best suited to Sweden, we can act more positively at an international level.

It may appear that all of the costs and

(Continued on Page 68)

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constraints from data policies will put an unbearable burden on the businessman. This is far from true. Although there are some inital adaptation and start-up expenditures, they are intended to see that data is better protected, more reliable and always available to those who need them.

Threatening Programs

I see many of the programs we are considering as strengthening and expanding the possibilities for both sellers and users of computers and communications systems. There may be some legitimate criticism, however, in what Sweden and other countries are doing on two points.

The first is that we have begun to examine vulnerability, labor market impacts, industrial polices and coordination of government computer applications somewhat late in the game. But democratic governments often respond that way.

Secondly, those bent on the ideal of absolute free trade see some of the policies for national capabilities as protectionist. This is because few countries have sorted out the level of endogenous support they feel necessary. I predict the final result will be far less protectionist than many expect.

Minimum Rules

Overall, however, I see these reshaping efforts as opening new possibilities to computing and automation, but with more rational development geared to serve individuals and society. We are not Luddites. Yet we insist on being masters of this tool and we will not give up our national sovereignty just because technology overlooks national boundaries and traditional laws and practices.

Personally I have tried to find the smallest common denominator as a platform for transnational data flows. These rules could apply to personal and nonpersonal data alike. There are six operating principles.

Computerized information entering any country will be protected according to the following provisions:

- Information shall not be divulged or used for any purpose other than the one which has been decided in its country of origin.
- Persons having legitimate access to this information shall be obliged to observe its secrecy.
- Unauthorized access to information, including its alteration, damage or destruction, shall be subject to legal penalties.
- Reasonable security measures shall protect the information.
- Reliable and continuous movement of such information shall be assured.
- In the case of personal information, individuals shall have the right of inspection, unless specifically denied by law.

I cannot find anything more international than transborder data flow. I want to keep it free and balanced, therefore I believe in my paradox that we have to regulate the free flow in order to keep it free.

International agreements have some advantages. Let's move to some agreement soon; I believe in the old Swedish proverb that "While the grass is growing, the cow will die."

Jan Freese is director-general of the Swedish Data Inspection Board. He served in 1971 as secretary of the parliamentary commission that wrote the Swedish Data Act.

Formerly a civil judge, the Swedish-born Freese has also authored several books on the impact of computers on government, business and society.

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ary in Luxembourg weekly by Telex and was there processed by an installation shared by the subsidiary and another bank. The output was mailed to Stockholm, and the corresponding files in Luxembourg were deleted. In its deliberations the DIB found that no risk for infringement of privacy was present and gave a three-year license to export data."

It is worth noting in regard to transborder data regulation and data protection that the privacy issue is being used by some countries not just for the protection of data pertaining to the individual, but also for purposes of broadening their legislative activities to controls of considerably greater economic scope and consequence, the rationale being that information is power.

This requires that the wider perspective of the subject be addressed from the private sector's point of view. However, before doing so I will place in perspective the international business community's role.

The purpose of private enterprise's presence in the international business community is to render service to its customers. The international business community per se — as corporate business citizens around the world — is in business to violate neither individual human rights nor host country laws. The commercial sector operates to exchange value given for value received with individuals, other business enterprises, governments and their related agencies.

In order to accomplish that objective, negotiated transactions must be completed in a timely manner. Would you not agree that everyone "wants it yesterday"? Buyer and seller alike require confirmation and essential information from time-critical operations, production, management and financial sources that is vital to the proper, timely processing and completion of each transaction.

In today's international marketplace, repetitive and timely processing of business transactions (particularly those which are time-critical) is the basis for reliable service and survival of the business community. Without the present state of data processing and communications technology, this could not be accomplished.

By necessity, this means data is processed and as required transmitted across international borders — for example, airline reservations, electronic funds transfer in support of high net-worth individuals, payments to relations in foreign countries and the consummation of international trade contracts.

Today's business community is global. It has extended the time-honored boundaries of individual nations' economic worlds. As such, the international business community is increasingly dependent on many forms of sophisticated technology, including computers and communications.

These technologies enable businesses to cope with the increased volumes, costs and time-critical requirements while continuing to render a quality product or service in a timely manner to the customer, regardless of location. Any legislative laws that ignore the vital necessity for the exchange and communication of information, both intra- and inter-country, ignore the prerequisites of what is required in the international marketplace.

Because of editorial sensationalism, scare tactics and opportunism related to transborder data flows and data protection regulation, it is worth taking a moment to reexamine the basic issues and concerns of the countries and private enterprises.

Identifying National Concerns

Rhetorically, it's probably worth asking the questions. Has each host country's specific concerns been quantitatively defined? Are they valid? Why all of a sudden the outcry? Is it not fair to assume that little exists today in computers, in principle, that doesn't already exist, in some other form of manual file, documentation or correspondence?

Little, I would suspect, is processed by computers or transmitted across national borders electronically that today is not otherwise communicated by mail, microfilm, microfiche, the press or telephone.

Throughout Europe, selected legislative or advisory bodies have enacted or recommended legislation which ad-

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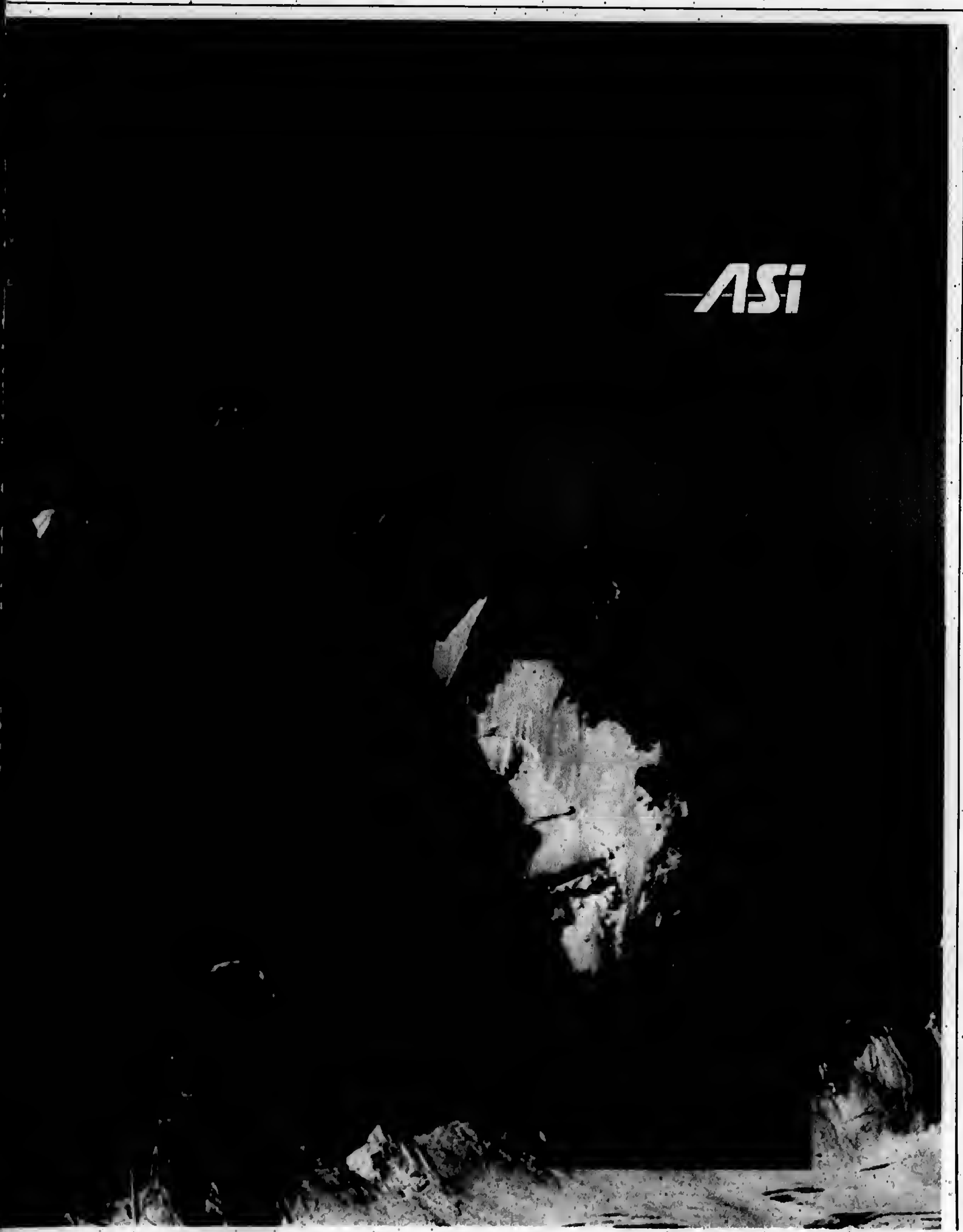

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dresses not only individual privacy, but the broader aspects and control of transborder data flows and in some cases all data stored or processed on computers by legal persons (companies) within selected nation states.

These actions, well-intentioned as they may be, appear to have occurred without sufficient forethought to their impact on the private sector. They may be costly, counterproductive and unwarranted.

To be more specific, where imprecise problem definition occurs within the EEC, the Council of Europe, OECD or other reciprocal bodies responsible at the nation-state level, legislative controls may cause the information to be confronted with a Data Curtain.

On the subject of individual privacy, I'm sure that, in principle, private enterprise would agree with those who believe access to information stored in data bases should be permitted to those properly authorized individuals either to whom the data refers or who have a need to know. However, I would caution the legislators to reflect that at the end of the day it is essential to the business community to be able to conduct its activities on behalf of its customers in confidence, on a reasonable and cost-effective basis, in a timely manner and without unnecessary bureaucratic overcontrol, monitoring or interdiction by regulatory authorities.

What is the true issue? If problems exist and are as serious as some would have us believe, let's identify them for what they are. Is it *really* a violation of individual privacy? Is strategic national data being transmitted across international borders and processed abroad that is so vital that it poses a threat to the most advanced countries of Europe?

Or are these arguments being advanced for political reasons while masking ulterior national motives?

In trying to answer these questions, one finds that, at the national level, selected countries are inconsistent in articulating the alleged problems and how to address them. The fears of each country appear to be different. The types of data which need to be safeguarded is defined inconsistently from country to country:

- For some, it is the necessity for protection of data regarding individuals.
- For some, it is the necessity for protection of data related to national sovereignty.
- For some, it is the sensitivity of data — and "sensitivity" is a term that has yet to be defined.
- For some, it is the transmission of data beyond the host country's national borders.
- For some, as articulated in the *Transnational Data Report* of March 1978, the political concern is "that free international data circulation [makes] loss of national independence a possibility [as evidenced by] the threats posed by the Swift interbank network and American Express operations as to public carrier monopolies and to private life." Is it realistic to infer that 600 of the world's banks are intentionally or unintentionally carrying on activities which are a threat to any nation's sovereignty?
- For some, it is the disclosure of data which includes legal persons.
- For others, it is economic data, data havens and so on.

It would be a tragedy if, without quantitative precision and substantiation, the issues of individual privacy and vital national data are used to further sway legislative bodies in order to achieve additional regulatory controls which adversely impact the private sector far beyond demonstrated need.

International banking, by its very nature, must be responsible, discreet and

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precise. The business of systems and communications is one which demands precision, responsiblity and discretion. In order to solve a problem, it needs to be precisely defined.

Should the solution be less precise than the problem definition, the side effects may be unnecessary, harmful and distorted. Is there any reason why, in regard to transborder data flows, the definition of the alleged problems should be any less precise? Isn't it a moral and professional responsibility of all involved to ensure precision and reasonable solutions?

This question is particularly relevant in those countries where legal persons are being included in data protection legislation. They are Norway and Denmark to date, with possible inclusion in Belgian, Luxembourg and Austrian law.

Ulterior Motives

The content of first-generation European legislation covering data protection and transborder data flows leads one to ask: Is the real concern protection for host country industries, neutralization of foreign competition, the erosion of control and monopolistic domination of the home market and labor displacement caused by a more competitive, cost-effective technological service offered outside a given nation state? Is the intent to hold international communications users to ransom in the name of transborder data flows in order to increase domestic communications or tax revenue?

These are but two of the questions which come to mind when a multinational deals with multiple host countries' national governments, regulatory authorities and legislation on this issue.

Turning to the practical aspects of dealing with this problem, if the integration of the world's international economy is to continue, it is essential to maintain the basic freedom of both the individual and the business community to participate in the world's interdependent economic systems. This requirement becomes increasingly dependent on data processing and improved information communications at all levels of the international economic community.

If the technical channel is throttled by legislative bottlenecks, clearly the private sector will be forced into rethinking how it will accomplish time-critical business activities which rely on international communications links.

Business Input Lacking

There is concern in the private sector about the manner and content of proposals and legislation on transborder data regulation and data protection already enacted in Canada, France, Sweden, Norway, Denmark and the U.S. and currently being formulated in committees reporting to the European Parliament, Council of Europe, OECD and individual nation states. There are a number of reasons for this concern.

Legislative proposals or recommendations are being framed at two levels: first, internationally by the appointed subcommittees to the EEC or by the Council of Europe and OECD and secondly, unilaterally by the nation states.

In general, the proposals being considered by the international organizations are being prepared by advisory groups which until recently, to the best of my knowledge, provided little opportunity for substantive input and dialogue from the business community. In the OECD there is wider participation and involvement from the private sector.

At the nation-state level in selected cases, a more meaningful bidirectional dialog exists. But it is clearly insufficient vis-a-vis the problems the private sector will face as a result of the resulting patchwork legislative approach. This is particularly so because of the lack of coordination between countries.

Given this state of affairs, what will be the resultant impact on costs, trade, finance, systems development, communications and overhead personnel requirements?

Parenthetically, I would ask whether it is unreasonable for those corporate or individual members of the business community to have the opportuntiy and right to participate in proceedings which formulate data protection regulations and legislation or tariff changes which will affect the business community at large, particularly since it is on

(Continued on Page 72)

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the international business community's financial shoulders that future legislation and its additional burdens of compliance and costs will eventually fall.

If a reasonable middle ground is not established between legislative perceptions of the problem, enforcement of present and future data protection legislation and the private business sector's requirements for a reliable flow of information, the legislative end products may well be a regulatory overkill. This will result in a lessening of business services, data transmission freedom, information communications and capability to render business services in a manner which supports host country and international clients.

At the moment, the issue has snowballed from what once was legislation covering individual privacy to a host of new categories, e.g., legal persons, data havens, national sovereignty and now value-added costs on software, on information processing and on communications. These issues are politically contentious; therefore, it would be in the interests of all that they be defused and prevented from becoming further politically polarized.

It would appear that adverse (cost) repercussions will affect the private-sector international communications user if regulatory controls cause the pricing policies of carriers, especially the European postal, telephone and telegraph (PTT) authorities, to be unilaterally escalated without a review of the potential impact on the private sector's operating costs and communications volumes. These regulations have obvious consequences:

- The potential restraint of foreign corporations' competition and trade because of increased operating expenses, decreased margins and higher prices to end users.
- Increased operational costs to foreign multinationals and host country multinationals which are high-volume data transmitter/receivers and users of DP and communications equipment as well as carriers, time-sharing services and network services.
- Deterioration of service as a result of use of alternative communications media.

It would appear that PTTs now perceive fixed-distance leased lines as a revenue-generating concept that is no longer viable and in the future will opt for volume transmitted information as a new tax/revenue base. If this is so, the business community has a clear right to know.

Before steps are taken by the PTTs to increase tariffs on information transmitted in support of financial, domestic or international trade, thought should be given to bulk rate pricing techniques, such as those in Germany, Canada and the U.S., and the elimination of widely varying communications tariffs within the EEC. Any proposals to increase tariffs or taxes on information stored, processed and transmitted would be most unwelcome by business in light of communications pricing discrepancies that already exist between the Americas, Europe, the Middle East and Asia.

Data protection legislation of one form or another has been enacted into law in the U.S., Canada, France, Germany, Denmark and Norway.

Legislation proposals or studies of varying degrees are under consideration in Austria, Belgium, Spain, The Netherlands, Finland, Australia, Ireland, Italy, Japan, New Zealand, the UK and Switzerland.

In the private sector there's no free lunch; the laws enacted thus far will have a future effect on its ability to function efficiently on a cost-effective basis.

The unilateral enactment of laws at the nation state level mandates some form of international reciprocity and standardization. Otherwise, the private sector is faced with an array of dissimilar requirements with which to comply.

Various national laws have already been enacted that contain a combination of licensing, registration and reporting requirements. Compliance means a monetary outlay that is not tax-deductible and calls for people-intensive efforts.

As regulatory compliance reporting is already a heavy burden on the private sector, it should not be escalated unnecessarily. Rather, those who are considering levying additional demands for information should be fully

(Continued on Page 74)

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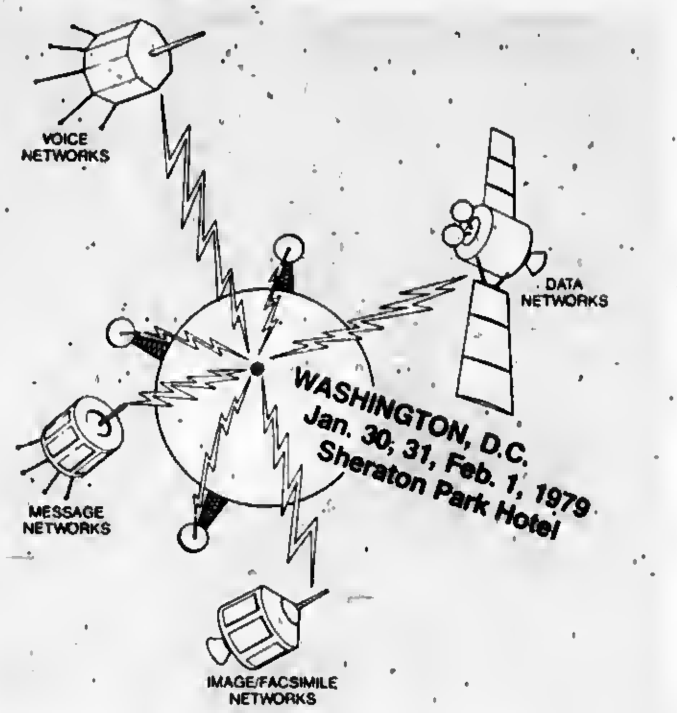

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TRANSBORDER DATA REGULATION: CON

(Continued from Page 72)

aware of what is already being reported, by whom, to whom and for what purpose and should consider alternative forms of obtaining, maintaining and updating the information.

There are some areas where it now appears that the first impact of data protection legislation will be felt by the private sector. Let's look at the German and French laws.

In France, the Data Processing, Files and Freedom Act enacted Jan. 6, 1978 stipulates that:

- Failure to comply carries penalties of anywhere from 2,000 to 1.6 million francs and prison terms of six months to five years.
- Companies must comply with the law within two years.
- Firms operating name-linked information processing systems must register the systems with the National Commission for Data Processing and Freedom.
- The form of declaration is comprehensive and covers the following areas: identity of register, person responsible, legal counsel for foreign-based firms, data base content, reason for system processing, name of department responsible for processing, name of department responsible for inquiries, defined limitations of operator(s), personnel with access, source of data, recipient of data, third parties to whom data may be given (auditors, for example), steps taken to ensure confidentiality of data, whether any name-linked data is to be sent out of the country and any changes in data base characteristics. The declaration goes on further to detail acceptable methods of processing which must be affirmed.
- For the banking industry, a point of particular relevance is that data on bankruptcy may not be held on file.
- The French law covers both manual and automated files.

As a point of interest and on a brighter note, the original draft legislation in France proposed inclusion of legal as well as physical persons. Legal persons have for the moment been dropped.

Turning to the Federal Republic of Germany Data Protection Act of Jan. 27, 1977, which became effective Jan. 1, 1978, there are several sections which impact the private sector and are therefore worthy of note.

The most visible requirement of the act specifies that in every private-sector establishment where at least five persons are involved in DP activities or where 20 or more people are involved with some form of tab or card systems(s), an individual will be appointed "data protection representative." His legal responsibilities include:

- Maintaining records on the type of personal data stores and purpose to which applied.
- Identifying the recipients of the processed output.
- Ensuring that software used to process personal records is used as prescribed within the act.
- Training DP personnel in the requirements of the Data Protection Act as required.
- Assisting and advising in the recruitment, selection and hiring of DP personnel.

Probably the most interesting feature of the act is its requirement that the data protection representative report directly to either the owner or managing director of the enterprise on matters regarding data protection.

The act does not prohibit the transport or communication of personal data to foreign countries provided certain contractual relationships exist and certain other prerequisites are met as specified in the act. This is obviously of more interest and concern to multinational and personnel recruiting enterprises.

The act requires that when data is stored in files, the data subject shall be so informed, have the right to request that data for review and be told to whom or what organizations the data is communicated.

A fee may be charged by the company for the provisions of such information, and provision of the above data may be withheld under certain circumstances defined by the act.

Incorrect data shall be corrected and such data may be blocked if its accuracy is disputed or cannot be proved.

There are other provisions which apply to commercial data processing by the private sector for third parties which I shall not recap here.

Penalties for premeditated violation

(Continued on Page 76)

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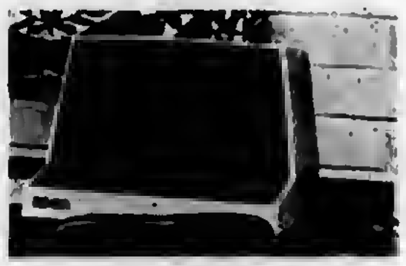

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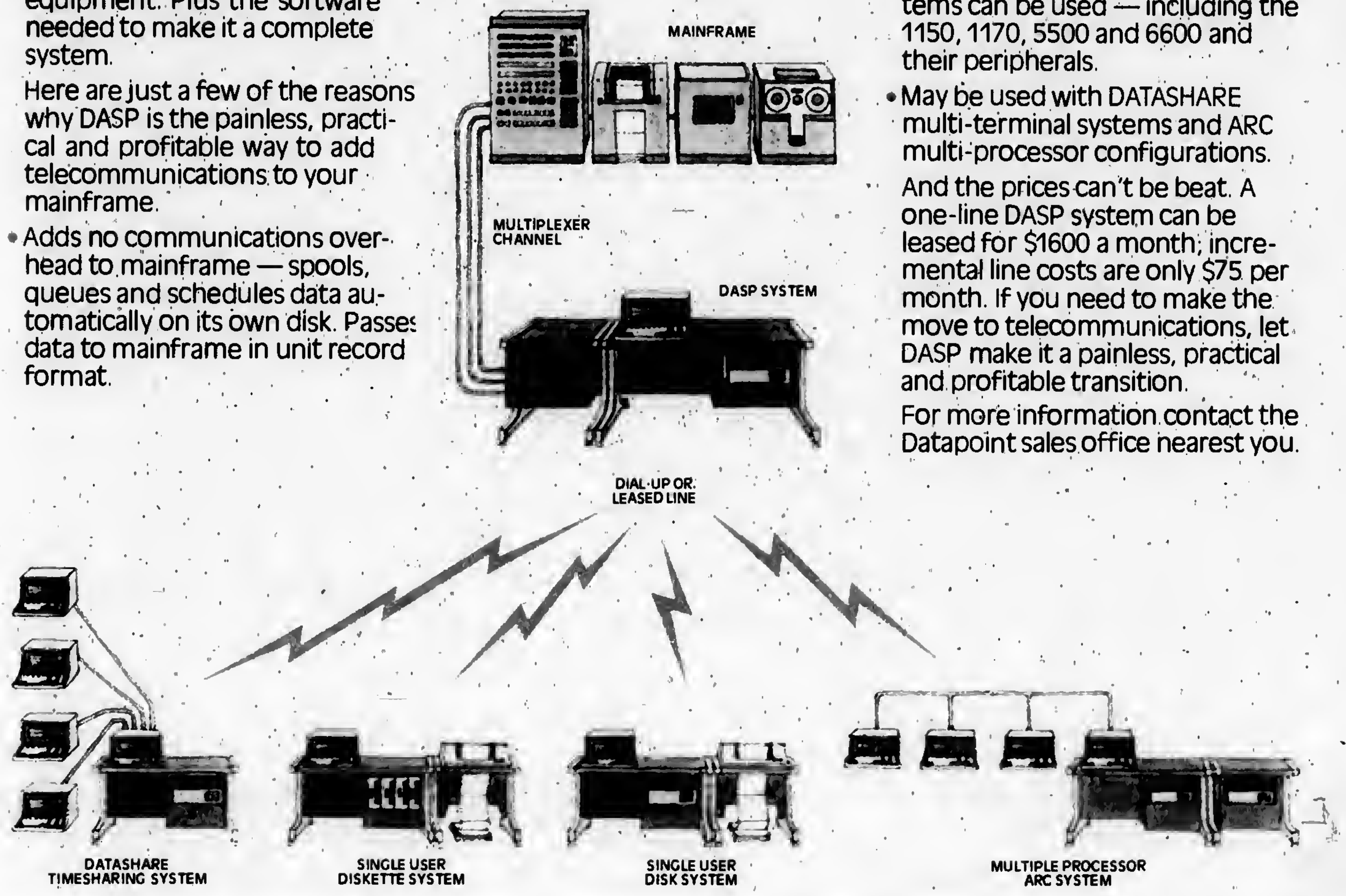
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(Continued from Page 74)

of the act range from two years' imprisonment to a fine of not more than 50,000 deutsche marks.

These are just a very few examples of the way in which data protection legislation will impact the private sector in the years ahead in only two countries. For those who have international responsibilities in this area, the implications should be clear.

Data protection legislation will impact the private sector differently in different countries where name-linked files or personal data is stored, processed or transmitted. The following aspects appear most likely to impact the private sector:

- Licensing, registration, data base description, government approval of computer applications and processing units with the associated incremental personal costs incurred.
- Notification and response to customers concerning the existence or content of data on file.
- Compliance with a host country's legislation — the appointment of data commissioners and their associated costs and withdrawal from revenue-producing service for the enterprise.
- Resolution of compliance with legislation in Country A which may be inconsistent and in violation of Country B's regulations because of a lack of harmonization.
- Inconsistent harmonization of laws resulting in patchwork compliance, requiring more knowledgeable and highly trained personnel dedicated to data production, and communications compliance activity.
- Escalated private-sector overhead costs — for administration, education, monitoring, reporting and auditing functions in support of data protection legislation — resulting in decreased gross margins.
- Imprecise definition/terminology in new data protection legislation, resulting in confusion and uncertainty in the business community's ability to comply and necessitating the involvement of a highly skilled legal staff for purposes of clarification on a country-by-country basis.
- Continued serious fragmentation of communications carriers, tariff-setting bodies, portocol groups, advisory groups, costs, standards, etc., resulting in escalated problems in international planning, information management and communications.
- Escalated uncertainty regarding ownership of data, international copyright and software protection.
- Potential application of data taxes, data barriers and legal sanctions.
- Inconsistent tariffs and negative approaches to volume-sensitive pricing, resulting in increased operating costs.
- Possible necessity for the redundancy files/data bases and the extra associated hardware and software required to maintain them.
- Possible imposition of excise taxes for the reimportation of data after foreign processing, designed to compensate for theoretical loss of revenue to domestic services.
- Increased difficulty for the commercial sector to plan, budget and implement foreign information management systems with predictable performance results, such as has been the case with the Swift interbank network because of inconsistent PTT activites.
- Uncertainty if the philosophy of free flow of information will continue; if it will not, this will have counterproductive effects on information-dependent multinationals.
- Curtailment of information transmission to only those countries with reciprocal data protection laws.
- Data protection laws which may establish additional international trade barriers to private-sector companies transferring data into or out of Europe.
- Data protection legislation may well be the first step in sanctioning state control and auditing of all information transmitted into or out of a nation state by the private sector. If data protection legislation is the next step in European moves toward protectionism the effects on the private-sector multinationals could be severe:
- U.S. time-sharing suppliers relied upon to a significant degree by U.S. multinationals may be priced out of the market by premeditated PTT tariff escalations.
- Data protection legislation may lead to an information war resulting in the protectionist Data Curtain.
- As data protection legislation in the EEC gravitates toward increased state

(Continued on Page 78)

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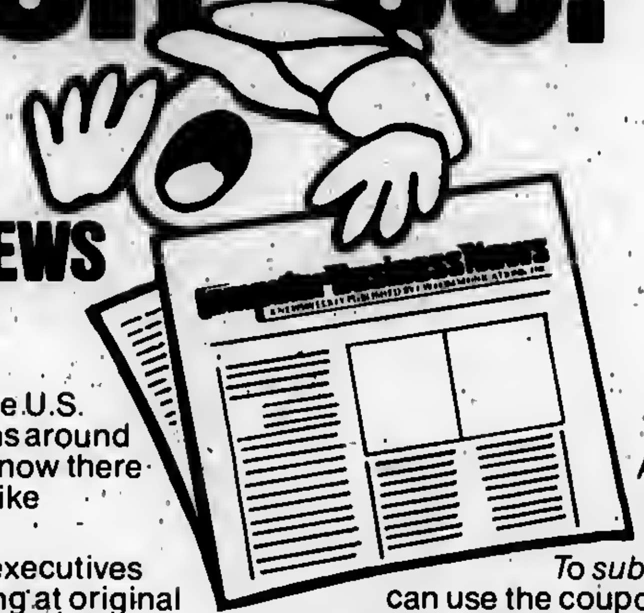

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(Continued from Page 76)

control, the Third World countries will follow.

- Lack of legislative harmonization will cause an inconsistent set of national standards with which the international business community will have to grapple.

The challenge of minimizing the problems and creating meaningful solutions will require major efforts. The business community must take the initiative, becoming more involved with the parties responsible to ensure that legislative actions are not proceeding without meaningful input from the commercial sector.

Heavy users of international communications wish to have the right to participate in a productive forum to contribute to resolving the issues with their host country governments, PTTs and related international agencies.

In the future, I suggest that legislation relating to information management processing, data protection, transborder data flows, pricing and tariffs should be moved into an open international forum to achieve harmonization of these issues on a country-by-country basis. Such a forum could be established by the International Chamber of Commerce, the Business-Industry Advisory Council of the EEC or the OECD.

It is essential that such a forum be created to provide the vehicle through which regulatory authorities, legislators, the business community and other interested parties achieve harmonization of legislation. Hopefully, agreement could be reached whereby nations would refrain from further unilateral action and restrain their well-intentioned efforts until discussions bring standardized solutions acceptable to both host countries and the commercial sector.

A serious commitment is needed to establish an ongoing forum composed of representatives from the business, regulatory and legislative communities and, last but certainly not least, the PTT administrations and carriers.

Problems must be defined precisely and discussed freely to understand the rationale for host country practices, thereby ensuring protection of individual privacy and tailoring solutions that do not threaten the international marketplace and the vital function it performs.

In order to place problems into perspective and resolve them equitably, the issues must be removed from the sphere of political agitation — to eliminate further polarization.

Information transmission and processing and transborder data flows are the life blood of international business — and they are essential to the international community's survival and well-being.

Rossiter W. Langhorne is vice-president of the Manufacturers Hanover Trust Co. and is based in London, where he heads the bank's international Automation Support Group. He is also responsible for worldwide communications for the International Division.

An American, Langhorne holds both a bachelor's degree in finance and an MBA in international business.

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We're big on resources . . . You need lots of high calibre equipment and technical support to take on projects of the magnitude we handle. You'll be working with our most powerful, new generation Criterion mainframes, the latest advances from our data communications divisions, a highly interactive battery of technical support specialists. And you'll have it all at hand in a plant-complex big enough to house your grandest ideas.

. . . but small in modus operandi We keep our project teams small. You work intimately with a few heavyweight professionals. That means you come to grips with more of the problem, share more of the responsibility. It also means that everyone carries his or her full weight and stands out with high visibility.

Outside — the good California life . . . Our pioneering development groups are at home in Rancho Bernardo, 22 miles up the coast from San Diego. Our 114-acre hilltop location has been called "one of the 10 best-designed facilities in the nation." You'll be in the midst of California's finest recreational facilities, including 70 miles of beaches from San Juan Capistrano to the Mexican border. You'll work where others come to vacation.

Immediate openings in many areas: If you have an engineering or computer science degree (or equivalent) and a year or more of experience in one or more of the areas listed, contact us at once.

SOFTWARE OPPORTUNITIES:

- **Distributed Network Architecture**
- **Transaction Processing**
- **Interactive Processing**
- **Data Base Design**
- **Performance Measurement & Analysis**
- **Configuration Management**
- **File Access Methods**
- **Operating System Development**
- **Compiler Design/Development**
- **Firmware Development**
- **Diagnostic Programming**
- **Test Systems Development**
- **MICR Proof Of Deposit Software**
- **Systems Architecture**
- **Tools Support**
  — time-sharing — compiler designs/developments (high-level block structured languages) — SW tools design
- **Distributed Intelligence Architecture/Interactive Systems Software Architecture**
- **Fifth Generation OS Architecture/Interactive Systems Software Architecture**

Mr. George Rice, Manager, Professional Placement, Engineering and Manufacturing,
Dept. K 50, NCR Corporation, 16550
W. Bernardo Drive, San Diego, California
92127.

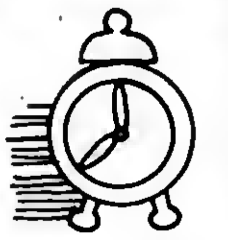
NCR
Complete Computer Systems

WHAT'S NEW AT NCR?

NCR is on the move. We've mounted a major, coordinated effort, backed by ample R&D resources, to emerge up front in 1980s EDP. For example, VLSI technology, distributed network architecture with interactive transaction processing and important new functions, advanced communication and I/O protocols, high-level PASCAL-based language, powerful new virtual systems, and advanced concepts in microprocessor-based terminals.

An Equal Opportunity Employer

The ROMAC DIFFERENCE



Enjoy Getting Up?

Certainly salary and advancement are important, but when you come to Romac, we "dig deeper" and search out those qualities that make you want to start each day with enthusiasm and vigor. Some call it our "getting up in the morning" syndrome. We call it a Romac difference. That's why many of the best EDP professionals look to us.

Call us now for outstanding career opportunities like these representative positions.

Manager of Technical Support	Wellesley Hills	$40,000
Programmer/Analysts	Stamford	$25,000
Consulting Manager (Charleston, WV area)	Rochester	$30,000
Systems Programmer (Northern Italy)	New Haven	$28,000
Lead Programmer/Analyst	Buffalo	$27,000
Programming Manager	Hartford	$25,000
Mgr. Systems & Programming	Atlanta	$40,000

ROMAC & ASSOCIATES
Personnel Consultants

Contact your local Romac office in Atlanta, Boston, Buffalo, Charlotte, Hartford, New Haven, Philadelphia, Portland, Rhode Island, Rochester/Syracuse, Stamford, Wellesley Hills or write A. L. Lemay, President, 2 Sun Life Executive Park, Wellesley Hills, MA 02181.

Marketing Representative

Computer Optics, Inc., a leading manufacturer of display terminal systems, is expanding its marketing force in the San Francisco and Los Angeles areas. The ideal candidate should have a minimum of three to five years experience selling computer peripherals (or mainframes) and be currently producing above average results.

Compensation package will exceed $40,000 for over-quota performance. Some management experience will be an asset, because we will be looking to promote from within.

If you feel that you are qualified and desire to be part of the dynamic terminal marketplace, please forward your resume including salary history, in confidence, to Mrs. B. Shepard, Computer Optics, Inc., Berkshire Industrial Park, Bethel, CT 06801.

Please call: 800-243-1314

Computer Optics Inc.
Berkshire Industrial Park, Bethel, CT 06801

EDP

AS SPECIALISTS IN SYSTEMS AND TELECOMMUNICATIONS

we can offer career opportunities in the following areas:

- ✓ DIRECTOR MIS
- ✓ SYSTEMS & PROGRAMMING MANAGEMENT
- ✓ SYSTEMS PLANNING & ADMINISTRATION
- ✓ INTERNAL CONSULTING
- ✓ PROJECT MANAGEMENT
- ✓ QUALITY ASSURANCE
- ✓ EDP AUDIT.

call or send resume stating area of interest

paul homer
Personnel Agency, Inc. - EDP Professionals
521 Fifth Ave., N.Y., N.Y. 10017
(212) 697-3300

Mini-Computer Programmer

PDP 11/45 7/32, 8/32 DG NOVA SEL 32/55, HP 3000, Honeywell Level 6 H 716, Two years exp. Req. Suburban Virginia & Md. locations. U.S. Citizenship req. $17-23K. Relocation Pd. Rush resume: Cybermetrics Corp., P.O. Box 579, McLean, VA 22101 Tel (703) 356-1997. Other positions avail USA & OS.

Programmer/Analysts For Washoe Medical Center Reno, Nevada

Two years' programming experience required. NCR NEET-3 and COBOL background preferred. Hospital experience desirable. Competitive salaries, generous benefits package, including state retirement plan, and excellent, stable working conditions. Call weekdays: (702) 785-4156 or apply to the Personnel Office:

WASHOE MEDICAL CENTER
77 Pringle Way
Reno, Nevada 89520

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DATA PROCESSING OPPORTUNITIES AT MUTUAL OF OMAHA

Mutual of Omaha, a leader in the insurance industry for over fifty years, is undergoing significant growth in our Computer Data Services Division. We offer professional careers in the technical, systems, administrative, and management areas of data processing.

We have an outstanding Career Progression Program and complete in-house Training Program to provide our employees the opportunity to develop in the area most suited to their career objectives.

Applicants with at least one to five years' experience using COBOL or BAL in an IBM 370 environment are preferred. An insurance background is also helpful.

If you are interested in pursuing a career with us, send your resume in strictest confidence, including salary history to:

MUTUAL OF OMAHA
PERSONNEL C/O MIKE FAUST
33rd AT DODGE STREET
OMAHA, NE 68131

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Join Our Software Engineering Team

Company and Product
Mathematica Products Group develops and markets the fastest growing software system in the industry—RAMIS II. Used extensively throughout the world, RAMIS II provides both a user-oriented, English-like nonprocedural language and a comprehensive data base system.

Position
Seeking individuals to participate in the continued development of the RAMIS II system.

Qualification
Candidates must be mature, self-motivated and must have demonstrated experience in developing software for at least three years. Fluency in BAL is required. Experience with Data Base Management Systems and knowledge of Data Base concepts and/or teleprocessing systems is considered a positive factor. The ability to communicate effectively orally and in writing is a requirement.

Compensation
Stimulating intellectual environment. Initial salary commensurate with academic training and experience, from $20,000 to $34,000. Excellent benefits.

For prompt consideration and a local interview send resume with salary history in complete confidence to Dept. B116.

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P.O. Box 2392, Princeton, New Jersey 08540
equal opportunity/affirmative action employer m/f

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We Need Data Processing Professionals to do a Tough Job.	Experience and Exposure in the Data Processing Community plus a Good Salary, Above Average Benefits and the Reward of the Challenge Itself.

We are a professional consulting company providing data processing services to business and industry in the Chicagoland area. We need experienced data processing professionals immediately to assist us in new and on-going projects.

These projects present a wide spectrum of computer technology including some of the most diversified hardware and software applications in the Chicago area. The members of our consulting staff start such projects at the conceptual phase and develop innovative systems for these applications.

If you have 3 to 5 years of experience as well as familiarity with two languages, we would like to talk to you. COBOL, PL-1 or ALC background is of special interest. Exposure to more than one operating system or computer manufacturer is desirable but not necessary.

For further information regarding career opportunities, please contact Mr. Dan Smith by phone or submit a resume for immediate consideration to:

DASD CORPORATION
2720 Des Plaines Avenue, Suite 251
Des Plaines, Illinois 60018
(312) 296-2924

your professional skills and career will grow with our achievements...

From our Bedminster, NJ headquarters, located on a beautifully landscaped 422-acre tract, AT&T Long Lines manages the network of long distance facilities that join together the telephone companies—both Bell and Independent—throughout the nation. We also provide and maintain overseas cables that link U.S. telephones with the rest of the world.

Using large-capacity microwave radio relay systems, underground coaxial cables, and communications satellites, AT&T Long Lines telecommunications networks handle more than 35 million long distance calls a day, and transmit many other kinds of communications such as radio and TV programs, news stories and wire photos, and data services for business and government.

To keep pace with and anticipate the continually growing demand for our services, as well as to develop new and innovative applications for telecommunications, we are seeking professionals interested in the unparalleled opportunities we offer.

AT&T Long Lines has seven operating headquarters and 650 locations in 47 states. Aside from the obvious advantage of being a member of the largest corporation in the world, you will benefit in numerous other ways. For one thing, you will be working in a state-of-the-art environment, and utilizing the most advanced computers, software, circuitry and engineering technology as well as leading edge marketing concepts. You will be working closely with some of the most respected engineers, scientists, computer specialists, and marketing professionals in the country. These will include people not only at AT&T Long Lines, but also at Bell Telephone Laboratories—our R&D Unit—and Western Electric Company—our Manufacturing Unit.

Underlying it all is the pride, security, challenge, and exceptional professional and career growth opportunities that come with being a part of AT&T Long Lines.

At AT&T Long Lines, you will enjoy outstanding opportunities for professional career development, along with good salary and a benefits program that provides full protection and equity for you and your family. For prompt consideration, candidates should send resume and salary history in confidence (specifying departments of interest) to: AT&T Long Lines, Professional Employment Director, Room 5A110CC, Bedminster, NJ 07921.

MARKETING OPERATIONS SUPPORT

Advanced degree (M.S., Ph.D.) in Operations Research, Statistics, Electrical Engineering, or equivalent work experience desired.

Algorithm Development

Responsible for the design and development of mathematical models and computational algorithms for various telecommunications marketing problems.

Market Environment Analysis

Responsible for the technical support for the company's market environment analysis, including the development of quantitative models, research methodologies and data bases.

Marketing Planning

Responsible for the technical support for the company's marketing planning function, including the development of a planning data base, resource allocation models and quantitative models in methodologies to improve the planning and tracking process. A preferred background will include an advanced technical degree or equivalent work experience in corporate planning.

Optimal Pricing

Position involves the development of marketing data for an optimal pricing project. Will also be responsible for applications of the Business Voice Market Planning System (i.e., evaluation of the economic feasibility of new generation satellite systems).
Advanced technical degree or equivalent work experience in statistics and market research desirable.

Data Management

Responsible for the collection, development, and maintenance of customer data for the Business Voice Market Planning System. Advanced technical degree, or equivalent work experience, including some marketing background and a familiarity with voice products desirable.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 101.

MARKETING—FORECASTING & REGULATORY SUPPORT

Advanced degree in Statistics, Operations Research, Computer Science, Economics, or equivalent work experience desired.

Research & Analysis

Responsibilities will include performing economic and statistical research and/or analysis required to develop and apply a variety of forecasting techniques tailored to forecasting interstate messages, revenues, etc.

Systems Development

Responsibilities will include developing, implementing, and operating two manual and computerized systems. One is a complete revenue forecasting system; the other a system that will compare and reconcile outputs of existing forecasting systems for construction and planning purposes.

Systems Design

This position will assist in the design and implementation of a computerized forecasting system. It requires a technical knowledge of operations research or computer science and two to three years experience in data systems design in industry.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 102

BUSINESS RESEARCH DEMAND ANALYSIS

Econometrics (Statistical Research Analysis, Trend Analysis, Forecasting & Rate Evaluation)

Apply state-of-the-art techniques in micro-demand modeling and forecasting to telecommunications needs in business research, service costs and rates, and marketing departments. Skills required: graduate level training in econometrics and micro-demand theory, strong background in statistics and demand modeling, excellent written and oral communications skills. Skills desired: market simulation experience, knowledge of cross elasticity studies, FORTRAN, and PL/1 programming, business experience in demand modeling and forecasting.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 103.

MARKETING SALES SUPPORT

M.S. in Operations Research or Computer Science or equivalent work experience with associated areas of study that include Optimization, Programming Systems Design, and/or Mathematics desired. Also desired, three to five years background in computer systems or operations research that includes some networking experience.

Algorithm Design

Will be responsible for the design, development, implementation, and training for specific algorithm modules within Advanced Communication System and other data network systems.

Administrative & Network Design

Will be responsible for the design, development, and implementation of specific modules within an administrative and network redesign system.

Systems Management

Will be responsible for the direct system operation and coordination of production for two marketing systems: a Switched Services Network Information System and an Automatic Message Accounting System.

Customer Profile Subsystems

Will be responsible for directing activities involved in the development of Customer Profile Subsystem and for assisting in the development of a Mechanized Collections System.

Customer Marketing Systems

Will be responsible for direct system operation and coordination of production for two marketing systems: a Customer Usage Tracking System and a Customer Oriented Market Model.

Data Network Design

Will be responsible for the design, development, implementation, and training for specific modules within data network design systems.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 104.

MARKETING—PRODUCT MANAGEMENT SUPPORT

Master's degree in Operations Research, Mathematics, Statistics, or Computer Science, or equivalent work experience desired. Background in market research or statistical consultation helpful.

Market Research/Statistical Analysis

Responsibilities include planning, executing, analyzing, and interpreting marketing projects involving market research and the statistical analysis of data.

Senior Quantitative Analyst

Position requires an advanced degree, preferably a Ph.D., or equivalent work experience in a technical area. It would also require two or more years experience in industry or education applying quantitative techniques, plus one to two years experience supervising a quantitative marketing team.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 105.

MARKETING SYSTEM SUPPORT

Requires Master's degree in Computer Science or, most important, work experience relating directly to the job, i.e., experience in a specific type of software.

Software Development

Responsibilities will include the demonstration of software development and maintenance under the RSX-11M or UNIX operating system of the DEC PDP minicomputer. These systems will be generalized for industry oriented use in the Long Lines National Demonstration Center. Will also act as the developer of tailored demonstration software packages.

Data Base Management Systems Programming

Responsibilities will include overall administration of the use of National Sales Center. The position will also oversee all software and hardware requirements for the center, acting in a technical consulting capacity to product and market management groups. Strong background in systems programming, specifically DEC PDP minicomputer required.

Customer System Support

Responsibilities will include coordinating all customer support activities for all Bell Modems, Low Speed Teletypewriter Terminals, and minicomputer systems that include the DEC PDP-11, data general NOVA, and similar systems.

Systems Programming Software

Background should include heavy experience in systems programming on IBM equipment and in various programming languages. A knowledge of several operating systems, access methods, and data base management systems is required.

Systems Programming Hardware/Software

Background should include experience in mainframes (particularly IBM), front-end processors, access methods, data base management, time-sharing, application programming, protocols, line monitoring, terminals, and networks.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 106.

PRODUCT MARKETING

Data Systems Sales

Responsible for providing expert advice and guidance to Sales/Marketing personnel on the selling of advanced data systems. Background must include 3-5 years experience in data equipment sales.

APPLICANTS FOR THE PRECEDING POSITION SHOULD REPLY TO DEPT. 107.

DATA SERVICES

B.S. or M.S. degree in Computer Sciences, Mathematics, or other related technical areas required. Two to five years direct programming experience desired.

IMS Systems Software Support

Responsible for the evaluation and implementation of new versions of IMS and maintenance of current versions of IMS. Background should include software design and development using IMS in COBOL, Assembler, or PL/1, and debugging.

MVS Resource Management Software Support

Responsible for support of software packages used in the operation and management of CPU's running MVS. Background should include software design and development in COBOL, Assembler, or PL/1, and debugging.

Minicomputer Software Technical Support

Background should include mini/micro computer programming, mini-ASM, mini-BASIC, minicomputer systems and subsystem design, and telecommunications design experience.

Enhanced Product Application

Background should include experience in structured programming and design techniques, COBOL, OS/VS S370 computer environment and JCL, standard access methods, time sharing for development and testing, and testing and debugging techniques.

Scientific/Experimental Software Modeling

Background should include programming experience with FORTRAN or PL/1, JCL, debugging techniques, structured programming techniques, and time sharing.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 108.

SERVICE COSTS & RATES

Microeconomics

Responsible for assisting in the development and application of economic pricing theories. This will involve applying mathematical techniques and economic principles to business problems. Econometric estimation of demand and production/cost function will also be required. Preferred background will include graduate degree in economics/econometrics or equivalent work experience.

Mechanized Information Systems

Responsible for the detailed definition and design of new or improved mechanized information systems and the maintenance of existing ones. May also be called on to retrieve data using RAMIS, GIS/VS, or MARK IV. Background should include experience in systems and subsystems design, conversion design, and systems testing.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 109.

ENGINEERING

Digital Information Micro Electronics

Responsible for work in the field of digital information transmission, including carrier, radio, and time division switched systems. Projects will involve field measurements of existing equipment and designing new equipment as needed. Preferred background should include a B.S. or M.S. degree in Electrical Engineering or Physics, and two to five years of relevant work experience.

Minicomputer Software

Responsible for the design and development of software for a real-time minicomputer environment. Background should include three years experience in software design and a B.S.E.E., M.S.E.E., or a degree in other technical areas.

Circuits & Switching Systems

Responsible for data transmission, multiplex equipment and transmission circuit design. Must have experience in all of the above areas.

APPLICANTS FOR THE PRECEDING POSITIONS SHOULD REPLY TO DEPT. 110.

CORPORATE COMMUNICATIONS

Writer/Editor

Responsible for writing and editing in connection with employee publications and news relations. Requires reporting, editing and layout of publications under strict deadlines. Candidate must have a solid journalism background, preferably at least three years experience on a metropolitan daily and/or wire service. Journalism degree preferred, but not essential. Professional journalism experience a must.

APPLICANTS FOR THE PRECEDING POSITION SHOULD REPLY TO DEPT. 111.

AT&T Long Lines

We actively seek male and female candidates from all ethnic backgrounds and the handicapped.

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In Distributed Data Processing
Systems are looking for

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This is your chance to take on a high-visibility challenge in microprocessor software development, including:

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To qualify for this postion, you need to have demonstrated a high level of competence, including:

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We offer competitive salaries, complete benefits, and an excellent opportunity for advancement. Please send your resume, in confidence to: MARION GRAHAM, Personnel Specialist

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Sycor puts computer power where the work is.

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OPERATING SYSTEMS ENGINEERS

An exceptional opportunity exists with National Semiconductor in San Diego, California for an individual with 5 plus years experience in IBM's DOS/VS operating systems. Heavy internals desirable. The successful candidate will be responsible for:

- Central support of IBM's DOS/VS operating systems.
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- Recommending hardware/software changes for our DOS/VS customer.

BSEE or Computer Science degree or equivalent desired.

If you are this indiviudal and wish immediate consideration, forward your resume in confidence to Derric Walters, NATIONAL SEMICONDUCTOR, LARGE COMPUTER PRODUCTS DIVISION, 10788 Roselle Street, San Diego, CA 92121. An equal opportunity employer m/t/h.

National Semiconductor

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Accepting the challenge is your job... Providing the challenge is ours.

Challenging opportunities are available for professional programmer/analysts with at least six months experience . . we're growing to make room for you

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Spear Street Tower
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San Francisco, CA 94105
or
Dan Grainger
500 E. Carson Plaza
Suite 224
Cerson, CA 90746
or
Mike Odom
10300 N Central Expwy
Building #1
Delles, Texas 75231

Informatics Inc

equal opportunity employer m/f/h

Programmer Analyst

Position available with regional support staff of newspaper group. Responsibilities include consulting and problem resolution, installing commercial applications software, maintaining existing systems. Experience with RSTS/E, BASIC + or BASIC + 2, and RMS desired. Newspaper experience helpful. Located in Midwest. Some travel.

Please send reply to:
C.W. Box 1726
797 Weshington St.
Newton, MA 02160

PROGRAMMER

Live in the beautiful Grand Teton Country. Large Eastern Idaho Credit Union seeking individual experienced on DEC PDP 11/70 with RSTS/E and Basic Plus. Banking or financial background desirable. Send resume to Mr. Tanner – P.O. Box 2869, Idaho Falls, ID 83401

SYSTEMS ANALYST

South & Midwest

Immediate openings for accomplished Systems/Analyst and Programmer/Analysts. IBM background along with DB/DC a plus. Salary 16-23K and clients pay fees. Send resume in confidence to:

Search E.D.P., Inc.
3152 Linwood Ave.
Cincinnati, OH 45208

DATA PROCESSING OPENING

Manufacturing company in SW Ohio has opening for person with background of programmer/analyst and experience in 2 or more of-

IBM S/3 — 15D with CCP

COBOL, RPG II

Knowledge of "CINCOM TOTAL" DBMS helpful but not required

Submit resume to:

Naomi A. McKee,
Personnel Director
YELLOW SPRINGS INSTRUMENT CO., INC.
Post Office Box 279
Yellow Springs, OH 45387

Real Time PROGRAMMERS

CAREER OPPORTUNITIES IN ENERGY MANAGEMENT

Outstanding growth potential in a state-of-the-art environment

Control Data Corporation has many excellent opportunities available in its Energy Management Systems Division, a growth-centered organization well-established in providing on-line network control systems for the electric utility industry. Our product line encompasses everything from acquisition to large-scale systems for security analysis, scheduling and load flow analysis—with total state-of-the-art applications.

Currently, our software department is seeking talented individuals with at least 2+ years experience in assembly or FORTRAN languages, microprocessors (INTEL 8080, PDP-11), CYBER or CDC 1700 computers, real-time systems, and process or supervisory control. Your responsibilities range throughout design, development, implementation, proposal support, standardization, data acquisition, man-machine interface, and others. Join us for a challenging and rewarding career in Energy Management Systems.

For Immediate attention, call 800-821-7700, Ext. 606 or write in confidence to:

Joy Vogelgesang

CONTROL DATA CORPORATION
2300 Berkshire Lane
Minneapolis, Minnesota 55441

An Affirmative Action Employer M F

NETWORKING/DATA COMMUNICATIONS

UNIVERSITY OF IOWA

The Weeg Computing Center is seeking an individual to provide leadership and technical expertise in its distributed computing, networking and data communications efforts. The selected individual will be instrumental in hardware/software planning and selection and will be responsible for network and communications software support. Systems programming and data communications experience are desirable. Salary range $16,800 to $26,625 depending upon qualifications. Send resume and salary history to:

Lee Shope
Weeg Computing Center
University of Iowa
Iowa City, Iowa 52242

The University of Iowa is an equal opportunity affirmative action employer

OUR STANDARDS ARE HIGH THEY HAVE TO BE

Our vice presidents personally hire each programmer/analyst (over 100 will be in 1978) because they know that a professional service firm's FUTURE IS YOU.

Immediate openings including Miami, Houston, Washing, D.C., Baltimore and Philadelphia areas. Call collect or send resume with current salary requirements to:

Mrs. Donna Koterba
Data Technology
6611 Kenilworth Ave., Suite 413
Riverdale, Maryland 20840
Toll Free 800-638-0911

PROGRAMMER ANALYST

Administrative systems. Design through documentation; planning, supervision and instruction require: 2- or 4-year related degree; 2-4 years' Programmer or Analyst experience, including significant BASIC applications and PDP/11 systems; good communication and interpersonal skills. PL/1 and RSTS/E experience helpful. Full-time, year-around position, offering salary based on qualifications, plus full benefits. Call 414-739-3681, or send letter and resume, including expected salary range and names of references to Mr. R. Whitcomb, Personnel Director, P.O. Box 599, Appleton, WI 54912.

OPERATIONS SUPERVISOR

A progressive retail firm is seeking an individual to supervise computer operations. The center operates an NCR C-2S1 in both batch and on-line environment. The ideal candidate will possess above average communicative skills and an ability to identify and solve problems. Responsibilities include: personnel supervision, system research, work scheduling, interfacing user departments, and the coordination of hardware maintenance. Please submit resume and salary history in confidence to:

Personnal Department
H.C. Prange Company
727 Plaza 8
Sheboygan, Wisconsin 53081

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COMPUTER PROJECT MANAGER

The University of Missouri-Columbia Medical Center is seeking a qualified individual for the position as Project Manager for Financial Applications. Experience in Patient Accounting and General Ledger Systems preferred, with strong background in programming and systems analysis. Salary range $18,000 to $27,000. Please send resume, salary history and salary requirements to:

Personnel Office
UNIVERSITY OF MISSOURI
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EDP Account Representatives • Technical Representatives
Marketing Specialists • Programmers • Programmer Analysts

Because we're GENERAL ELECTRIC INFORMATION SERVICES

You know you can be more creative, more productive, more successful in every way if you're doing a job that fits you to a "T." That's how we see it, too, at GE.

And because we're so broadly involved in EDP, because we have so many varied openings in so many functions and fields, we can match your abilities and interests with a high level of precision.

For example, are you turned on by:

- selling to top management?
- developing and promoting DP services?
- DP problem solving?
- creating market plans and strategies?
- technical consultation and planning?
- business operations analysis?
- developing systems software?
- communications software design?

Which areas are you strong in?

- financial applications (banking, brokerage)?
- telecommunications?
- production methods and systems?
- administrative operations (payroll, personnel)?
- operating systems (MVS, GCOS)?
- network accessing and interactive software design?
- compiler design?
- you name it.

Why is GE able to tailor a job to your measurements?

- We are in a stage of widespread expansion of what has become one of GE's major market activities—DP services—so we have plenty (hundreds) of jobs to fill.
- The scope of GE data processing services to the widest spectrum of commercial users poses needs for marketing or sales oriented people who know their way around one or more of the many areas of business activity. All that we really want is your previous involvement in a major DP systems installation.

And, to keep this international network of 19 large-scale mainframes state-of-the-art, there is a need for computer software pros to design new systems, develop modules for a proprietary operating system, innovate unique applications in all areas of business, and even invent new languages.

Time to reroute your career?

Not only do you get a position that fits, the options remain open after you're in. Again, our continued large-scale expansion makes on-the-job changes possible—for example, from Technical Representative to Account Representative, from Programmer to Technical Representative, from systems software to communications software, and so on. If you're now on the wrong track, GE offers an opportunity to reroute your career onto paths that lead to greater rewards.

Of course, we need only point to the other advantages of a GE assignment: a distinguished name that opens doors at the highest levels, a reputation for quality and effectiveness in all GE products, and matchless technical support resources.

OPENINGS NATIONWIDE

We have opportunities for experienced **Sales Representatives** and **Programmer/Analysts** (with emphasis on FORTRAN) in major cities coast-to-coast.

In Maryland, at our Headquarters center, we have opportunities for IBM and Honeywell large-systems **Programmers, Application Programmers and Programmer/Analysts** with FORTRAN and other hi-level language backgrounds; **Senior Marketing Specialists** who know how to develop a product and get it to the customer; and many other DP opportunities for ambitious people who want to match their own rapid growth rate with ours.

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digital

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Hoffmann-LaRoche, located in Suburban New Jersey, 12 miles from New York City, is one of the world's leading manufacturers of pharmaceuticals, vitamins and fine chemicals. We have an opportunity for an individual to design software systems for computer and micro-computer instrumentation. Design responsibilities will include developing specifications through interactions with hardware design and user personnel.

REQUIREMENTS:

Masters in Science or Engineering or equivalent. Minimum of 5 years experience including developing programs for minicomputers and microprocessors in Assembly language. FORTRAN experience and knowledge of logical design are plusses. Ability to interact productively with an interdisciplinary group of technologists is essential.
Please send resume, including present salary to: Mrs. Eleanor M. Malone, Professional Placement Specialist

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amdahl

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The National Institute for Community Development, Inc. (NICD), a private for-profit corporation engaged in providing managerial and technical services to governmental agencies and private organizations, is currently recruiting for the following full-time permanent positions:

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NICD, conveniently located near Washington, D.C., offers competitive salaries and benefits. NICD is an equal opportunity employer. Applicants are directed to file a letter of application and brief resume of qualifications to NICD at 1815 North Lynn Street, Arlington, Virginia 22209, Attn: Mr. Jeffrey A. Miller or call (703) 522-1461.

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Please send applications to
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CHARLOTTE, NC 28202 — J. Schwab, 1742 Southern Nat'l Ctr., 704/375-0600
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Chicago based Fortune 200 corporation with international operations is actively seeking two MIS management professionals. Internal promotions have created the need for the following:

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Will assume full responsibility for MIS planning and SDM/70 implementation. Incumbent will directly assist divisional manufacturing personnel in MIS planning; establish policies and procedures for systems planning and coordinate the development and integration of long range systems plans. 25% travel. A 10 year background in hardware/software systems, large-scale project management experience, a thorough understanding of systems development methodology, and management experience required.

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MIS ADMINSTRATION

Will assume full administrative and budgeting responsibility for the corporate MIS function. Solid background in systems coupled with 5-7 years financial analysis/administrative experience in MIS that includes an indepth knowledge of budgeting and ROI/ROA essential.

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mri SYSTEMS CORPORATION

SOFTWARE DEVELOPMENT PROGRAMMER

MRI SYSTEMS CORPORATION, the Data Base Management Company, is expanding the Product Development Department in beautiful Austin, Texas.

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Qualifications and experience desired:

- Teleprocessing applications or development experience
- 360/370 Assembler language
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- Programming experience using CICS
- BTAM-BSC or SDLC experience desirable

If you qualify and desire to join a progressive company with state of the art expertise, we would like to talk with you. Send your resume in confidence to:

Gil Hickenbottom
MRI SYSTEMS CORPORATION
P.O. Box 9968
Austin, Texas 78766
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DIRECTOR, LAB COMPUTER SYSTEMS

We have an immediate need for an individual with significant experience in computer operations, including applications systems analysis in a related setting. Will be responsible for planning, developing and implementing systems in support of laboratory operations; for supervision of staff and setting of short and long range goals consistent with sound budgetary planning; and for assistance in research applications. We require a degree in Biological Sciences and extensive knowledge of FORTRAN; mathematics and medical technology experience desirable. We offer excellent salary and benefits, a highly desirable location near country and shore areas and the stimulation of working in one of the east's major university-affiliated teaching hospitals. For confidential consideration send resume with salary requirements to

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Personnel Department

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Challenging position available for a qualified OOS/VS Programmer/Analyst for our Bank Service Subsidiary. Candidates should have 2-3 years programming experience and must be proficient in assembler and COBOL languages. Must have Banking background; experience in deposit or lending applications preferred. We offer an attractive compensation package.

Please forward resume and salary requirements to Affiliated Banks Service Company, 8461 Delaware, Denver, Colorado 80221

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Send resume to
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N.Y. 10801.

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Due to rapid expansion of our Field Maintenance Services, we have openings in our Field Maintenance Group for qualified Field Engineers trained on IBM 360/370 Computer Systems or their associated OEM Peripherals.

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If you're a minicomputer software professional looking for more involvement and reward, make the right move....to Honeywell.

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Exciting positions for senior systems analysts who can assume full project and design responsibility at state-of-art levels. You'll be involved in structured network architecture and the design of congruent products that can fully exploit that architecture. Other responsibilities could include special purpose real-time and OEM systems, business and transaction processing systems and special challenges in modularity and applications mobility across executive environments. Minimum of 4 years experience (ideally in communications/networking) is required.

WORD PROCESSING

These positions involve maintaining and extending multi-terminal word processing applications on multi-function minicomputer operating systems. 1-3 years assembly language experience in communications (especially networking) would be appropriate qualifications.

SOFTWARE SUPPORT

We need dynamic individuals with 2-4 years communications programming experience and, ideally, a solid background in either IBM communications software or a major vendor's distributed network architecture. This is a unique opportunity for high-level visibility and a reasonable amount of domestic and international travel in resolving complex customer software problems.

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You'll be involved in the analysis, design and development of CNC/DNC and post-processor systems for computer-aided manufacturing processes and test equipment. You should have 2-4 years experience in systems design/programming on minicomputers and have some prior exposure within a N/C manufacturing environment.

Sound interesting? If so, make the move ...forward your resume, including area of interest and salary requirements to Mr. L.J. Doherty, HONEYWELL S/MISD, MS-804, BM-002, 300 Concord Road, Billerica, MA 01821.

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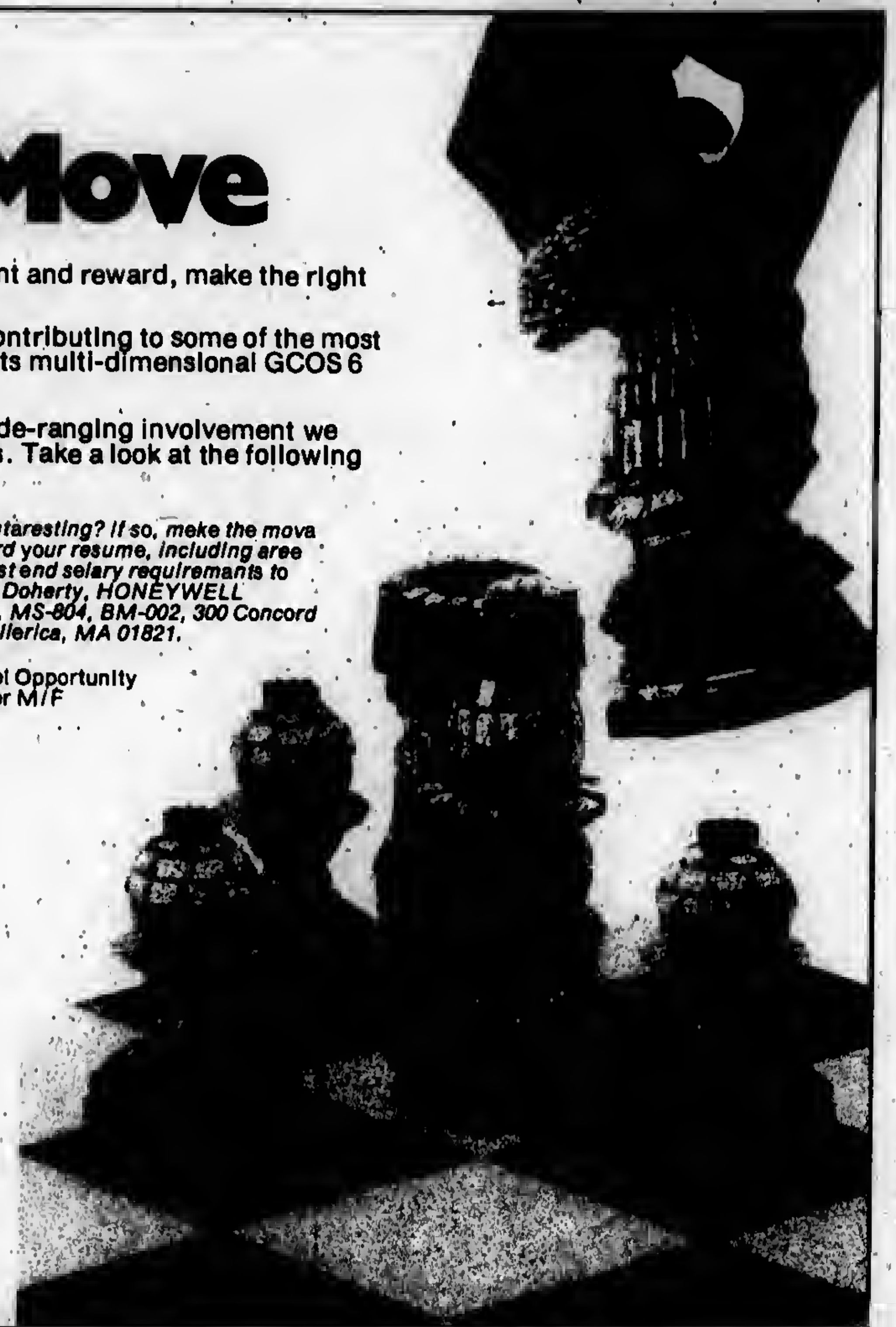

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Please send resume and salary history in strict confidence and/or call: Toll free (800) 327-4989.

Mr. Robert Coyner
Manager Professional Staffing
Harris Computer Systems Division
1200 Gateway Drive
Fort Lauderdale, Florida 33309

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The salary is open and based upon experience. Send resume to Al Westhaver, Schnitzer Steel, P.O. Box 10047, Portland, OR 97210.

The School District of Oconee County has an opening for a Computer Assisted Math Program Coordinator, effective immediately. Master's degree desirable; experience of successful human relations skills; experience and/or training in Computer Science; experience and/or training in math and math education desirable.

Contact the Dir. of Personnel
School District of Oconee County
P.O. Box 220
Walhalla, SC 29691
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Expansion of our Management Systems operations has created career opportunities in the design, installation and maintenance of operating systems, application software packages and associated software for large computer systems operating under IBM 370 and CDC-175. We have immediate openings for Software Systems Specialists. Selected candidates will implement and assist in the coordination of major software installations in the areas of MVS/JES 3, CICS/VS, IMS or Telecommunications.

A BS degree in Computer Science or Business Administration coupled with 4 or more years data center experience in computer operations, JCL, etc., and 3 or more years applications and systems software programming experience are essential. Candidates with 5 or more years systems software programming experience and at least 1 year project management experience will be considered for Senior-level opportunity. Must be highly motivated with a strong analytical approach to software systems development.

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COMPUTERWORLD

FLORIDA SYSTEMS ANALYSTS

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Large time sharing service organization is seeking the right individual to fill an entry level position in its systems programming department. The person selected will be involved with the enhancement and support of our time sharing system, operating system and communications network. Candidates are required to have a Computer Science degree and a working knowledge of Bal. Familiarity with APL is a plus. Salary to $15,000 depending on background. Interested applicants should send a resume to:

Mr. C. Watson
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Position available December 18, 1978. Previous experience with and utilization of an administrative or business computer system. Minimum one year experience as a system programmer in an OS/VS or MVS environment. CICS knowledge/experience desirable. Prefer knowledge of and/or experience with a Data Base management system. Bachelor's degree or equivalent professional experience required. Salary commensurate with qualification and experience. Resume by November 20, 1978 to:

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Located in west suburban Chicago, the Cooperative Computer Center (CCC) serves the administrative data processing needs of three Board of Governors Institutions: Chicago State University, Governors State University and Northeastern Illinois University. Resources include a staff of 60, production software developed by SCT Corp. and an ITEL AS/4 computer supporting several RJE stations in an OS/VS1 environment.

Reporting to a council of the three university presidents, chaired by the governing board's Executive Director, the CCC Executive Director is responsible for optimizing the performance of present resources; developing long-range ADP plans, preparing operating budgets, recruiting staff, allocating resources, project management, and ensuring that the universities receive timely and accurate management information.

Minimum academic qualification is a bachelors degree; an advanced degree in Computer Science or a related field is preferred. In addition, candidates should possess significant technical and administrative experience related to the management of an administrative computer center. Such experience should include a successful record of planning, budgeting, policy development, coordination and technical leadership for cost-effective university information systems. Candidates must be able to establish effective working relationships both with senior executives and technical personnel, and be sensitive to the varying information needs and political considerations within a university cooperative.

Starting annual salary is highly competitive with executive salaries in higher education and is negotiable, depending upon experience. Applications must be received by November 17, 1978.

Send resume, references and salary history to:

Dr. Donald E. Waltars
Chairman, CCC Director Search Committee
c/o IEC
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Employment Agency for Computer Professionals

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Interested applicants should call J.E. Jensen collect at (919) 549-8421, or send resume, in confidence, to him at Data General Corp., 62 TW Alexander Drive, Research Triangle Park, North Carolina 27709.

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ADVANCED COMPUTER TECHNIQUES

SYSTEMS SOFTWARE DEVELOPMENT SPECIALISTS

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NEW YORK/INTERNATIONAL. Immediate requirement to fill the following positions:

- **Systems software developers** with data management, report generation, and inquiry experience.
  Locations: New York end Milan, Italy.
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Please indicate your area of interest and send resume to:

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WASHINGTON/NEW YORK. Immediate requirement to fulfill the design and implementation of a free-standing intelligent disk subsystem (back-end DBMS machine) utilizing Honeywell Level 6 hardware.

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Mr. T. Scully
ACT Corporation
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DATA PROCESSING OPPORTUNITIES

We are looking for 2 experienced professionals to join our commercial data processing staff.

SYSTEMS & PROGRAMMING SUPERVISOR

Qualified candidates should have several years experience in a commercial data processing environment in progressively more responsible positions, and have the ability to understand business problems as well as recommend/implement cost-effective solutions, possess a related degree, and have the ability to communicate effectively with all levels of users, managers, and co-workers. Experience with on-line systems and data base management, as well as an advanced degree and some supervisory experience is desired.

SYSTEMS PROGRAMMER

Responsible for operating system generation and maintenance on an IBM 370/138 OS/VS and several PDP 11/70's with RSTS/E. Must have strong background in IBM system maintenance, JCL, COBOL, assembler language, debugging, BTAM. Experience with RSTS/E data base management, telecommunications, and software package installation in maintenance a plus.

Pleese send resume and salary history in confidence to:

EMPLOYMENT MANAGER
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- College degree and 2 years experience programming
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- Support/Customer Interface
- Problem Determination/Problem Solving
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With National CSS, you will enjoy excellent salaries, liberal company benefits and ongoing opportunities for career growth. You will have the opportunity to experience a broad range of development projects while working with the most advanced computer system in the industry. For immediate consideration please forward your resume with salary history (only those resumes which include salary history will be considered) Richard Brittain, Corporate Recruiter, Box A, National CSS, Inc.; 542 Westport Ave., Norwalk, Connecticut 06851

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Positions are involved in the design, programming and support of large complex applications, many of which involve on-line teleprocessing. Major equipment used is Control Data, Honeywell, IBM. Installations are located in several cities. Applicants should indicate type of positions applied for.

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STATE OF OREGON
Personnel Division
100 Public Service Bldg.
Salem, OR 97310

CHEMBANK

SYSTEMS ANALYST

PROGRAMMER ANALYST

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SYSTEMS ANALYST: Our ideal candidate will have at least 2 years experience in the design batch and on-the-line systems for large scale IBM computers.

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Data Processing Manager
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Personnel Administrator,
Edwards and Kelcey, Inc.,
70 South Orange Avenue,
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SYSTEMS PROGRAMMERS (4)

2-5 years systems experience; familiar with operating system concepts, assembly language expertise; communications and transaction processing a plus. Preference to Data General Commercial Eclipse-RDOS/AOS and Honeywell Level 6. Send resume to:

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Manager, Employment

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A requirement is a B.S. degree in Computer Science, Mathematics, Engineering or related fields.

For immediate consideration, call 1-800-243-3342 toll free or send your resume (including salary history) to Professional Recruitment, Office 124, Pratt & Whitney Aircraft Group, East Hartford, Conn. 06108.

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Data Processing

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(408) 249-9353

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- Must have participated in the implementation of interactive systems including:
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  - Load Planning
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Personnel Dept.
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Position requires:

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Data Processing

SYSTEMS SOFTWARE PROGRAMMERS

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PROGRAMMER/ANALYSTS

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Republicsteel

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c/o
Director of Business Systems Group
406-R, Department B
P.O. Box 6778
Cleveland, Ohio 44101
or call 216-574-4542
for further information.

"an equal opportunity employer"

Republicsteel

DATA PROCESSING MANAGER

Rapidly-growing multi-plant manufacturer on AMEX located in Northern suburbs of Philadelphia is seeking a Corporate EDP Manager.

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Our Data Processing facility, located in Tehran, Iran, is among the largest in the Middle East. The hardware is Dual Honeywell 6060. The software is GCOS, COBOL, GRTS, GMAP and TSS. Applicants include Maintenance/Material Management and Personnel/Payroll as part of our Integrated Logistics Management Systems.

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To schedule an interview in advance, call us on our Toll Free Number — 800-63B-0B42. Otherwise, join our Technical and Administrative Staff in Chicago on Wednesday, November 15 from 11:00 AM to 7:00 PM and Thursday, November 16 from 10:00 AM to 4:00 PM. Ask for Ms. Schonberger at the Palmer House and stop by. We'll be happy to meet with you.

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Mr. Frank McKain
Systems Research & Development, Room C-73
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Candidates for this position should meet the following qualification requirements:

- Minimum of 3 years experience in the analysis and design of large scale financial systems applications
- COBOL programming and systems analysis experience, preferably with IBM 370 OS/VS environments
- Proven oral and written communication skills
- Data entry, hardware and software experience desired
- On-line and ODP applications experience desired
- Human services applications experience desired

The successful candidate will be under contract for a minimum of six months, extendable to twelve or eighteen months at the Department's option. Salary range: $20,000 — $25,000, depending on experience. Please forward resume and salary information to:

Department of Public Welfare
Office of Management Services
Room 904 — Saltonstall Bldg.
100 Cambridge Street
Boston, MA 02202

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EOE M/F

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Will participate in the support and enhancement of major areas of the 3033 operating system. Prior support experience desired in the areas of I/O device support, virtual memory management, CPU scheduling or file systems.

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Will install, maintain, and enhance compilers and other parts of the operating system. Prior VS, VM, or MTS support experience desired.

NETWORK DEVELOPMENT COORDINATOR:

Will participate in the design, implementation, and support of a multi-CPU communications network, using X.25 protocols on PDP-11 and 3033 equipment. Prior experience desirable: communications equipment; DEC; 370 hardware and software.

HARDWARE AND COMMUNICATIONS SPECIALIST:

Will design and implement specialized communication, data acquisition, and related computer hardware and software. EE degree preferred. Microprocessor and programming experience desirable.

STATISTICAL CONSULTANT:

Will assist faculty and students on computer software (SPSS, BMDP, MIDAS, etc.) and statistical procedures. M.S. degree in statistics required. Experience with consulting, programming, and appropriate statistical software desirable.

Salary is open depending on experience. Send resume, 3 professional references, and salary requirements to: Manager of Recruitment, RPI, Pittsburgh Building, Troy, New York, 12181.

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Indiana University Purdue University at Indianapolis
Director of Technical Services

The 22,000 student IUPUI campus in Indianapolis, serving both Indiana and Purdue Universities — including the country's largest medical school — is looking for a highly qualified data processing manager to assume responsibility for the direction of its Technical Services Department.

Technical Services has full responsibility for all systems software on the three academic mainframes at the Indianapolis Campus: DEC 1090 with 512K words of memory and 800 MMBytes of disk storage, IBM 370/125, and 360/44. All three systems are used for instructional and research computing, with some administrative applications. Technical Services includes groups specializing in statistical and mathematical programming, operating systems, telecommunications, consulting, mini and microcomputers, and software systems, with a staff numbering about twenty.

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Graduate (technical degree) with minimum of one year experience with medium to large scale computers in solving and/or analyzing scientific or engineering related problems. (Prefer electric power utility experience).

SYSTEMS PROGRAMMERS

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Data Communications Analysts/Programmers

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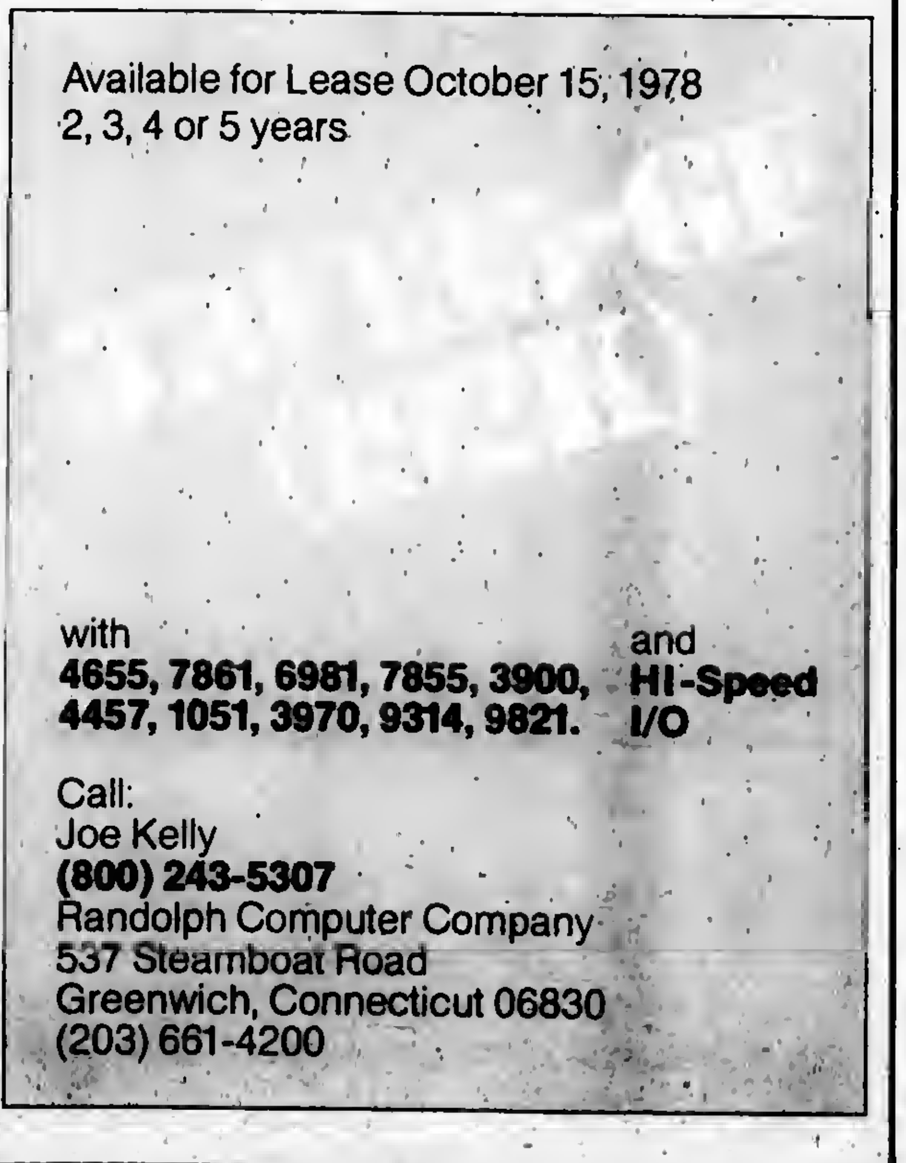

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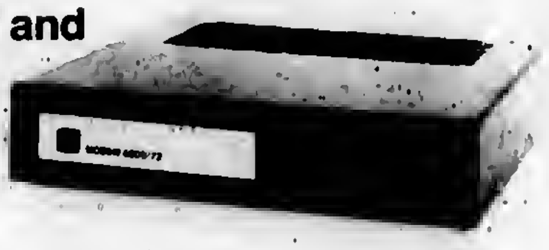

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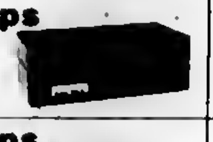
3600 bps 	**MDDEM 3300/36** Dial or dedicated operation with reverse channel. Built-in auto-answer on dial-up.	$3620 $85/mo.*	**$950** **$38/mo.***
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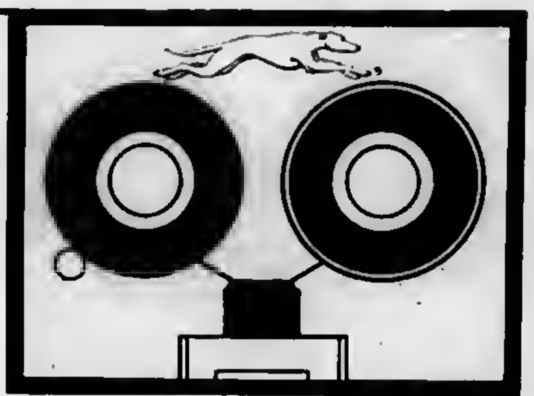

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Request for Proposal No. 400 due 3:30 p.m., Friday, November 17, 1978, for the acquisition of a software package capable of running on the IBM System 3/10 to perform all accounting, billing and reporting functions for the National Defense Student Loan program and National Direct Student Loan program.

Request for Proposal No. 401 due 3:30 p.m., Friday, November 17, 1978, for the acquisition of two disk storage devices to be attached to an existing Xerox Sigma 9 computer system and plug compatible with existing Xerox/Honeywell 7275 disk drives and controller

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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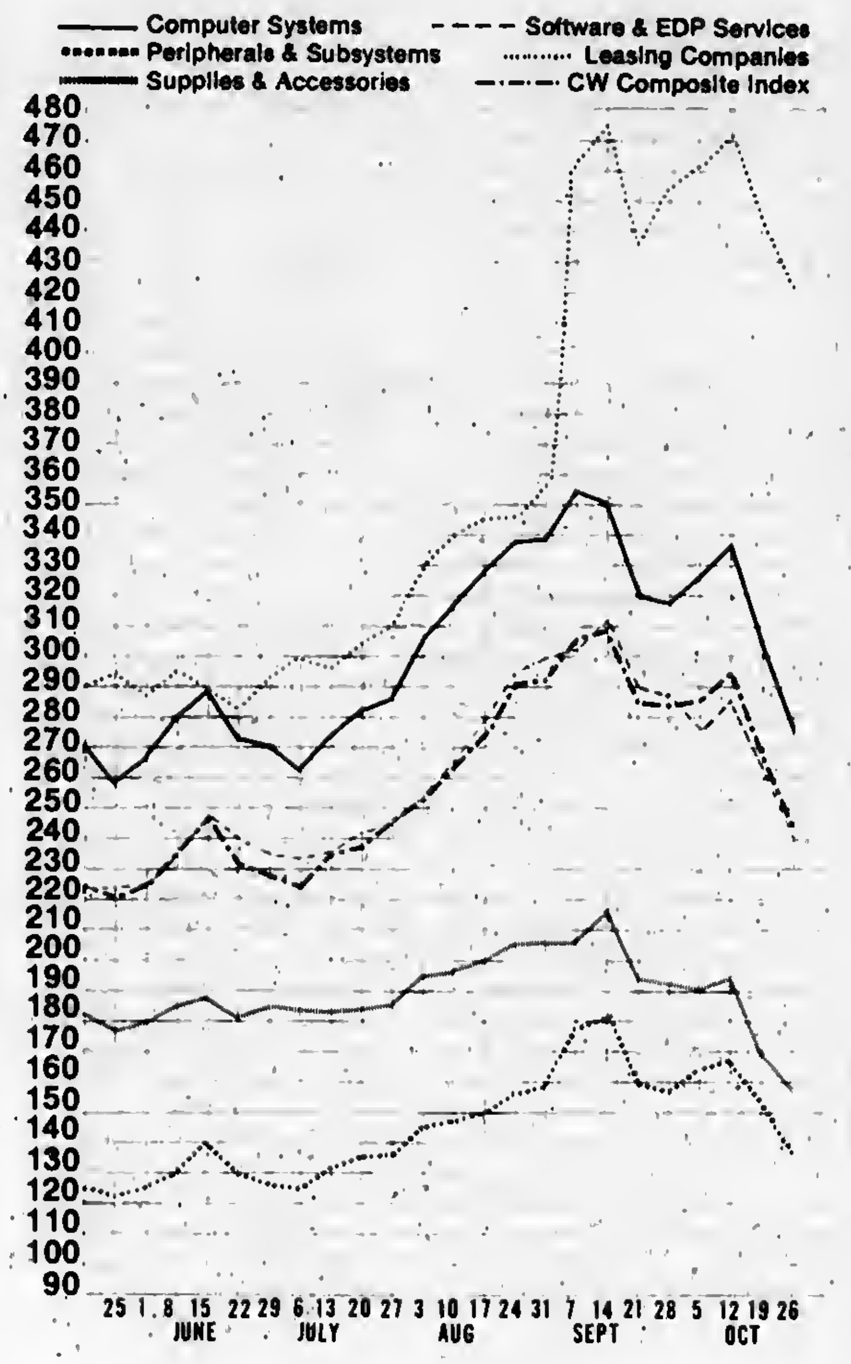

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Three Months Ended June 30

	1978	1977
Shr Ernd	$.35	$.41
Revenue	4,605,000	3,445,000
Earnings	441,000	486,000
6 Mo Shr	.68	.79
Revenue	8,777,000	6,724,000
Earnings	858,000	879,000

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Year Ended July 1

	1978 (000)	1977 (000)
Shr Ernd	$3.40	$2.78
Revenue	1,438,582	1,058,814
Earnings	142,189	108,500
3 Mo Shr	1.08	1.05
Revenue	412,552	330,345
Earnings	48,318	41,108

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Year Ended June 30

	1978	1977
Shr Ernd	$.74	$.27
Revenue	6,291,400	5,760,300
Disc Op	149,400	12,900
Spec Cred	62,400	2,800
Earnings	410,200	154,000

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Three Months Ended June 30

	1978	1977
Shr Ernd	$.22	$.12
Revenue	3,647,000	2,490,000
Earnings	171,000	88,000
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Earnings	319,000	159,000

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	1978	1977
Shr Ernd	$1.11	a$.93
Revenue	4,123,000	3,703,000
Earnings	573,000	489,000

a-Adjusted for a 10% stock dividend paid in June 1978.

INFORMATION INT'L

Three Months Ended July 31

	1978	1977
Shr Ernd	$.14	$.07
Revenue	3,661,219	2,493,883
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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 25, 1978

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 25 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	43 3/4	-6 1/2	-12.9
N	BURROUGHS CORP	59- 87	71 1/4	-1	-1.3
O	COMPUTER AUTOMATION	20- 44	19 1/2	-6 3/4	-25.7
N	CONTROL DATA CORP	23- 44	32 1/2	-2 7/8	-8.1
O	CRAY RESEARCH INC	21- 74	53	-5	-8.6
N	DATA GENERAL CORP	42- 71	57 3/8	-2 3/8	-3.9
N	DATAPOINT CORP	34- 75	52 1/2	-7 1/2	-12.5
N	DIGITAL EQUIPMENT	39- 54	46	-1 7/8	-3.9
N	ELECTRONIC ASSOC.	2- 13	8 3/8	+ 1/8	+1.5
A	ELECTRONIC ENGINEER.	11- 19	12 3/8	- 7/8	-6.6
O	FOUR-PHASE SYSTEMS	19- 46	30 5/8	-4 3/4	-13.4
N	FOXBORO	28- 40	33 3/4	-1 3/4	-4.9
O	GENERAL AUTOMATION	7- 26	14 1/2	-2 1/8	-12.7
O	GRI COMPUTER CORP	1- 3	1 1/2	- 3/4	-33.3
N	HEWLETT-PACKARD CO	62- 93	80	-5 1/4	-6.1
N	HONEYWELL INC	43- 72	62 1/4	-3 3/8	-5.1
N	IBM	236-305	273 3/4	-6	-2.1
O	MANAGEMENT ASSIST	9- 29	17 1/8	-2 7/8	-14.3
O	MICRODATA CORP	10- 23	14 7/8	-2 3/8	-13.7
O	MINI-COMPUTER SYST	5- 8	5 3/4	- 3/4	-11.5
O	MODULAR COMPUTER SYS	7- 17	10 1/2	-1 1/2	-12.5
N	NCR	37- 67	61 5/8	-3	-4.6
N	PRIME COMPUTER INC	20- 43	29 1/4	-3 3/4	-11.3
N	PERKIN-ELMER	17- 28	22 1/8	-2 3/8	-9.6
N	RAYTHEON CO	29- 58	46 1/4	- 3/4	-1.5
N	SPERRY RAND	33- 49	42 1/8	-1 3/4	-3.9
A	SYSTEMS ENG. LABS	11- 24	14 1/2	- 1/2	-3.3
A	WANG LABS.	12- 32	23	- 7/8	-3.6

LEASING COMPANIES

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 25 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	13- 21	18 1/2	-1 1/2	-7.5
O	COMDISCO INC	5- 22	16 3/4	- 1/4	-1.4
A	COMMERCE GROUP CORP	1- 1	1/2	- 1/8	-20.0
A	COMPUTER INVSTRS GRP	1- 7	3 1/4	- 1/2	-13.3
M	DATRONIC RENTAL	1- 3	2 5/8	- 1/8	-4.5
A	DCL INC	3- 5	4	+ 1/8	+3.7
N	DPF INC	8- 14	11 5/8	-1 1/8	-8.8
N	ITEL	16- 36	26 3/4	-1 5/8	-5.7
N	LEASCO CORP	24- 36	33 3/8	-1	-2.9
O	LEASPAC CORP	1- 4	2 3/4	+ 1/4	+10.0
A	PIONEER TEX CORP	4- 7	4 1/8	- 1/4	-5.7
N	U.S. LEASING	13- 20	15 3/4	-1 1/4	-7.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
U=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 25 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/8	- 1/8	-10.0
O	ANACOMP INC	8- 22	13 1/4	-1 1/2	-10.1
A	APPLIED DATA RES.	8- 17	11 1/4	+ 1/8	+1.1
N	AUTOMATIC DATA PROC	24- 36	28 3/4	-2 1/4	-7.2
O	COLEMAN AMERICAN COS	1- 2	1 3/8	- 1/8	-8.3
O	COMPU-SERV NETWORK	7- 12	8 1/4	- 1/4	-2.9
O	COMPUTER HORIZONS	1- 9	7	- 1/4	-3.4
O	COMPUTER NETWORK	8- 16	8 1/2	-2 1/4	-20.9
N	COMPUTER SCIENCES	8- 17	12 1/2	- 3/8	-2.9
O	COMPUTER TASK GROUP	1- 4	3 3/4	- 1/4	-6.2
O	COMPUTER USAGE	2- 4	3	- 1/4	-7.6
O	COMSHARE	6- 19	14 1/4	-1 1/2	-9.5
O	CULLINANE CORP	19- 33	19 3/4	-3 1/4	-14.1
O	DATA DIMENSIONS INC	4- 9	6 3/8	- 1/4	-3.7
O	DATATAB	1- 2	1 1/8	- 1/8	-10.0
N	ELECTRONIC DATA SYS.	15- 25	18 1/4	-1	-5.1
O	INSYTE CORP	1- 3	1 1/8	- 5/8	-35.7
O	IPS COMPUTER MARKET.	2- 3	3	- 1/4	-7.6
O	KEANE ASSOCIATES	3- 6	4 1/2	- 3/4	-14.2
O	KEYDATA CORP	1- 3	2 1/8	- 1/4	-10.5
A	LOGICON	11- 19	12 1/4	-1 3/8	-10.0
O	MANAGEMENT DATA	1- 2	1/8	0	0.0
A	NATIONAL CSS INC	15- 36	24	-2 3/8	-9.0
O	NATIONAL DATA CORP	7- 13	9	- 7/8	-8.8
A	ON LINE SYSTEMS INC	17- 30	19 3/4	-3	-13.1
N	PLANNING RESEARCH	4- 10	6 7/8	- 3/4	-9.8
O	PROGRAMMING & SYS	1- 1	1 1/2	0	0.0
O	RAPIDATA INC	3- 7	4 5/8	- 7/8	-15.9
O	REYNOLDS & REYNOLD	18- 36	27 3/4	-1	-3.4
O	SCIENTIFIC COMPUTERS	3- 9	7 1/8	- 3/4	-9.5
O	TYMSHARE INC	18- 33	24 3/8	+ 1/2	+2.0
A	UPS SYSTEMS	5- 8	5 7/8	-1 1/8	-16.0
N	WYLY CORP	1- 7	5	- 3/4	-13.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 25 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	21 7/8	-2	-8.3
O	ADVANCED MEMORY SYS	7- 18	13 1/8	- 3/8	-2.7
N	AMPEX CORP	10- 19	13 7/8	-1 7/8	-11.9
O	ANDERSON JACOBSON	5- 10	5 3/4	- 7/8	-13.2
N	APPLIED DIG DATA SYS	11- 22	11 3/8	- 3/4	-6.1
O	BEEHIVE INT'L	4- 7	4 5/8	-1 1/8	-19.5
A	BOLT,BERANEK & NEW	6- 14	9 1/2	-2 1/8	-18.2
N	BUNKER-RAMO	10- 20	14 3/4	-1 1/2	-9.2
A	CALCOMP	3- 13	7 1/2	-1	-11.7
O	CAMBRIDGE MEMORIES	3- 9	5 5/8	- 1/4	-4.2
N	CENTRONICS DATA COMP	16- 37	26 3/8	-4 1/8	-13.5
O	COGNITRONICS	1- 4	2	- 1/4	-11.1
O	COMPUTER COMMUN.	6- 12	6 3/4	-1	-12.9
O	COMPUTER CONSOLES	4- 10	7 1/4	- 1/2	-6.4
A	COMPUTER EQUIPMENT	3- 6	4 5/8	- 3/8	-7.5
O	COMPUTER TRANSCEIVER	1- 3	3	- 1/4	-7.6
O	COMTEN	9- 38	25 1/2	-3 1/4	-11.3
N	CONRAC CORP	18- 26	18 1/8	-1 1/8	-5.8
O	DATA ACCESS SYSTEMS	3- 14	11	- 1/2	-4.3
O	DATA 100	9- 20	19 1/4	0	0.0
A	DATA PRODUCTS CORP	15- 25	16 3/8	-2 3/4	-14.3
O	DATUM INC	2- 6	3 3/8	- 5/8	-15.6
O	DECISION DATA COMPUT	2- 6	3 1/8	- 1/2	-13.7
O	DELTA DATA SYSTEMS	1- 1	1 1/4	0	0.0
A	DOCUMATION INC	6- 34	22 1/8	-3 3/4	-14.4
O	DATARAM CORP	6- 32	23 1/2	-4 1/2	-16.0
N	ELECTRONIC M & M	4- 9	5 3/8	- 5/8	-10.4
O	FABRI-TEK	1- 2	1 1/8	- 1/4	-20.8
O	GENERAL COMPUTER SYS	1- 3	1 3/4	- 1/8	-6.6
N	HAZELTINE CORP	10- 17	12 5/8	-1 1/2	-10.6
N	HARRIS CORP	17- 36	30 1/2	-1 1/4	-3.9
O	INFOREX INC	6- 11	7 7/8	- 1/4	-3.0
O	INFORMATION INTL INC	8- 12	9	- 1/4	-2.7
O	INTEL CORP	39- 62	49	-2	-3.9
A	LUNDY ELECTRONICS	4- 8	5 3/8	- 3/8	-6.5
O	MSI DATA CORP	12- 19	12 1/4	-1	-7.5
N	MEMOREX	27- 59	31	-9 1/4	-22.9
N	MOHAWK DATA SCI	6- 15	8 5/8	-1 3/4	-16.8
O	OMEK	2- 6	5 1/2	- 1/2	-8.3
O	PENRIL CORP	5- 12	10 1/2	- 1/4	-2.3
N	PERTEC CORP	9- 17	11 5/8	-1 1/8	-8.8
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 1/2	0	0.0
O	RECOGNITION EQUIP	7- 13	8 3/4	-1 1/4	-12.5
O	SCAN DATA	1- 5	2 3/8	- 1/4	-9.3
N	STORAGE TECHNOLOGY	19- 46	25 1/2	-4 3/4	-15.7
O	T BAR INC	11- 20	15 1/2	-2 1/2	-13.8
O	TALLY CORP.	4- 9	5 3/8	-1 3/8	-20.3
A	TEC INC	6- 13	8 1/2	- 3/4	-8.1
N	TEKTRONIX INC	33- 50	43	-2 1/2	-5.4
N	TELEX	3- 9	5 3/4	- 1/2	-8.0
O	TESDATA SYSTEMS CP	11- 23	10 1/2	-3 1/2	-25.0
O	WILTEK INC	1- 2	1 1/2	- 3/8	-20.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1978 RANGE (1)	CLOSE OCT 25 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	8	0	0.0
O	BALTIMORE BUS FORMS	2- 4	1	0	0.0
A	BARRY WRIGHT	14- 30	24 1/2	- 7/8	-3.4
O	CYBERMATICS INC	1- 1	5/8	- 1/4	-28.5
O	DUPLEX PRODUCTS INC	15- 30	15 1/2	- 1/2	-3.1
N	ENNIS BUS. FORMS	8- 17	10 7/8	-2 1/8	-16.3
N	3M COMPANY	43- 66	58	-1 3/4	-2.9
O	MOORE CORP LTD	26- 34	29 1/2	- 1/2	-1.6
N	NASHUA CORP	18- 37	26 7/8	- 7/8	-3.1
O	STANDARD REGISTER	20- 27	22	-2 1/2	-10.2
A	TAB PRODUCTS CO	8- 16	11 1/2	- 3/4	-6.1
N	UARCO	19- 31	30	+1 3/8	+4.8
A	WABASH MAGNETICS	10- 22	15 3/4	-2	-11.2
N	WALLACE BUS FORMS	18- 33	26	-1	-3.7

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NEWSPAPER

DPers and Management: Three Views

By Brad Schultz
CW Staff

NEW ORLEANS — DP professionals must overcome a serious image problem if they aspire to top corporate positions, a session of the 1978 Data Processing Management Association (DPMA) conference was told here last week.

"Many of us are considered overhead — the department that spends," Joseph J. Simone told the session entitled "From Data Processing Into Management — the Importance in Being Cost Effective." The comments of Decision Data Computer Corp.'s

(Continued on Page 6)

By Marcy Rosenberg
CW Staff

NEW ORLEANS — For the DP manager, the times they may be a changin.

"DP managers are now penetrating the senior levels of their organizations," according to Irwin J. Sitkin, vice-president of corporate DP and administrative services for Aetna Life & Casualty Co. and this year's Data Processing Management Association (DPMA) man of the year.

Sitkin, who manages one of the largest DP installations in the country, joined Aetna in 1954 as an IBM supervisory clerk. In 1960,

(Continued on Page 6)

By Brad Schultz
CW Staff

NEW ORLEANS — Today's DP manager should not feel limited to a technically oriented career path. In fact, the DP manager can attain the highest corporate positions, according to speakers at a session of the 1978 Data Processing Management Association (DPMA) conference here last week.

More DPMA coverage on Pages 10, 12

An individual needs intelligence most of all

(Continued on Page 6)

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Donald Duck Cleans Up In HUD Audit

By Marcy Rosenberg
CW Staff

WASHINGTON — While Donald Duck may not be able to slip past the Federal Bureau of Investigation, he was more successful at the Department of Housing and Urban Development (HUD) recently when the agency's supposedly safeguarded IBM 7074 issued him a $99,900 paycheck.

In what was referred to as the "Walt Disney Affair," Donald's name and those of 29 other cartoon characters were added to HUD's payroll by the General Accounting Office (GAO), watchdog over federal spending, as part of an audit check.

GAO disclosed the incident in testimony before the Subcommittee on Compensation and Employee Benefits of the House Post Office and Civil Service Committee. The subcommittee is investigating possible abuses of federal overtime pay, which totalled $1.5 billion for the last fiscal year, $300 million more than for the previous year.

The 30 fictitious names were placed on the HUD payroll system to determine whether an employee skilled in computer manipulations could defraud the government, according to John J. Cronin, assistant GAO director.

"We ran the experiment on the HUD computer on off hours at night," Cronin said. "HUD authorized the computer time for us and helped us duplicate some of its files on a minimaster file. We did not play with its live files, so no checks were actually issued. However, the computer accepted all transactions and computed net pay."

(Continued on Page 8)

CW Poll Reveals

DP Firms Questioning Pay Guides

By Brad Schultz
CW Staff

Many firms in the computer industry will not limit salary increases to 7% per year in compliance with the voluntary wage-price guidelines President Carter recently proposed as part of his Administration's fight against inflation.

That was the consensus of industry spokesmen *Computerworld* polled to learn how the Carter proposal may affect DP professionals.

In a nationally televised address, the President asked U.S. employers for a 7% average in wage and salary hikes, which is reportedly about half the salary growth rate for DPers [CW, Oct. 30]. Carter also requested each U.S. business to limit price increases over the next year to .5% less than any increase during 1976-77.

The plan is called voluntary, but Carter said any uncooperative firm faces denial of government contracts, subsidies or other benefits.

To be competitive in sales, a computer vendor must be competitive in DP salaries, according to Harold O'Kelly, chairman of the Computer and Communications Industry Association (CCIA) and chief executive officer of Datapoint Corp.

A vendor that posed a 7% lid would experience a massive turnover in professional and managerial employees, O'Kelly said, adding that is exactly what happened when salary constraints were last imposed — on a mandatory basis — by President Nixon.

If confronted with such a lid, many DPers would jump from one employer to another for better pay, O'Kelly explained, noting the lid covers salary increases during a term of employment, but not between terms of employment.

(Continued on Page 5)

Hardware Problems Cause Near Standstill at O'Hare

By Marguerite Zientara
CW Staff

CHICAGO — O'Hare International Airport came to a virtual standstill for two hours on Oct. 25 because of computer hardware problems at the O'Hare control tower and the nearby Air Route Traffic Control Center (ARTCC). As a result there were "massive air traffic delays in the Midwest," according to Richard Scholz, O'Hare air traffic controller and a representative of the Professional Air Traffic Controllers Organization (Patco).

The snafu, which resulted in 75 to 100 airplanes lined up for take-off, very few departures and no more room for incoming planes, came in the ninth month of a federal judge's continuing deliberation on whether to accede to a group of O'Hare air traffic controllers' demands for a computer backup system [CW, March 20].

A week after the incident took place, the cause of the problem at O'Hare was determined to have been "foreign material in one of the memory units of the Automated Radar Terminal System (Arts III)," according to Neil Callahan, public affairs officer for the Great Lakes Region of the Federal Aviation Administration (FAA).

The foreign material referred to was "a speck of dirt too small for the human eye to detect," he said. It was found on an internal wiring connector of the memory unit and was cleaned

(Continued on Page 8)

IBM Chip Facility Brings New Beat to Vermont Town

Last week IBM opened the doors of its new semiconductor manufacturing plant to the press. From the facility, which produces the firm's latest 64K memory circuits, our reporter filed this report on the setting.

ESSEX JUNCTION, Vt. — Two centuries coexist within a few square miles here amidst the mottled brown landscape, now lying hard and unyielding under the cool, windswept autumn sky.

The 18th century is well represented by the farms nestled in the valleys and mountainsides, marked by steep-pitched roofs and herds of black and white, milk-rich Jersey cows now confined to barnyards and huddling together for protection from the winds that whip along the shores of Lake Champlain in this corner of Vermont that nestles against the Canadian border.

And the seminal years of the 21st century are represented here by a huge, fortress-like, brown brick IBM plant covering more than 600,000 square feet and enclosing the latest computer-controlled production equipment. It rises out of the brown earth as a precursor of the future.

The men on the farms go about their tasks accompanied by the rhythms of nature, sowing the fertile valley earth in the spring and feeling the warming

(Continued on Page 4)

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As Result of Union Talks

Boston Papers Forced to Limit DP

By Ann Dooley
CW Staff

BOSTON — This city's two daily newspapers have been forced to limit their plans for automation as a result of contract negotiations with Boston Local 13 of the International Typographers Union. Union members feared the text processing systems would displace their jobs.

The *Boston Globe* agreed during the recent contract negotiations to install text processing CRTs on a limited basis, allowing the union to retain partial jurisdiction and job security for its members. The agreement cannot be renegotiated at any time or modified by changes in newspaper management or union leadership, according to Henry Vitalle, president and business manager of Local 13.

The settlement was heralded as a real victory for typographers on many small and large newspapers throughout the country who face replacement by computers. National union officials called the *Globe* contract "the best contract negotiated in the U.S. and Canada" in recent years.

The Globe contract allows the paper to install an automated system so reporters can write stories, edit them at their terminals and send them to be phototypeset, thus circumventing the human typographers. But copy not written by a staff reporter, such as stories "coming in over the counter," display advertising and legal notices, will still be handled by the typographers. Accompanying proofreading and page makeup will also be handled by the printers.

The work will keep people busy, especially during the transition period, Vitalle said, adding that union members will still have control over their jobs. There will be no layoffs when the system is installed nor any in the future unless just cause can be shown on an individual basis, he noted.

The *Globe* will offer workers dollar incentives to retire before the usual retirement age of 65 years.

"We maintained our dignity and avoided several hundred workers being laid off from their jobs," Vitalle said.

Neither *Globe* nor *Herald* spokesmen could be reached for comment.

Common Clash

Although the union allowed *Globe* management to get a foot in the door of automation, union leaders and members seemed positive about the gains they obtained. Such is not the case for most union locals in the nation, however, which have battled against invading computer technology.

The clash between typographers and management over automation is becoming a common one as costs to produce newspapers skyrocket and automated equipment proves to be less expensive than human workers.

The fight is often considered one of survival for both sides. Newspapers have folded all across the country, unable to meet expenses. union typographers fear their jobs are being wiped out by technology. Management and many union leaders see automation as an inevitable process, but the union is fighting to stave off the inevitable for as long as possible, observers agree.

Solutions to the problem are expected to be difficult. Several major newspapers, such as the *New York Times* and the New York *Daily News*, have experienced long and bitter union strikes over the introduction of automation into the composing room.

A *New York Times* contract, finally signed after nearly 14 months of negotiations in 1974 [CW, June 5, 1974], allowed management unrestricted use of automated equipment while union members were granted lifetime job security and early retirement benefits. Printers could be transferred to jobs in other departments as they opened up or could wait in a "sub" room for any odd assignments the composing room foreman might have.

The liberality of the agreement was attributed to the fact that management knew it wouldn't have to deal with the typographers once their jobs were phased out by retirements.

Other newspapers — the *Baltimore Sun*, for example — have successfully attempted retraining programs for printers, but many printers resent being shuffled to other jobs and are bitter about being forced out of a profession they view with pride.

The computer seems to be the victor in the unions' struggle with management over automation: Union membership is estimated at 60,000 today, down from 94,300 in 1961.

Atex Installation Scheduled

BOSTON — The automated system the *Boston Globe* intends to install is an Atex, Inc. text management system. It will be installed in three phases over a seven-month period beginning Nov. 13.

The system will include a total of 190 specially designed CRTs spread among 250 users. It will also include four Digital Equipment Corp. PDP-11/04 processors, each with 256K of memory, and one Control Data Corp. 80M-byte disk drive. Each processor will support 30 writing/editing terminals.

For extensive editing purposes, four PDP-11/34 processors, each with 256K of memory and a CDC 80M-byte disk, will support the remaining 70 terminals.

Two 96K-byte PDP-11/04 processors will serve — one as a backup — for wire service copy. All the equipment will be linked together by a multiprocessor bus to form a large network system.

Several Teletype Corp. Model 40 upper/lower case line printers will be used for any hard copy that is needed.

The system will also include a backup PDP-11/34.

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LANDSLIDE

The results are already in for the Great Sorting Election of 1978!

(54% vote for Syncsort OS, only 36% for IBM 's "top" sort.)

Call (201) 568-9700.

Ask for a copy of the latest "sort census."

Ah, we can almost see and hear it now! It is Election Night, and there is Good Old Reliable Walter, sitting exactly where you'd expect him to be—at the anchor desk in Election Headquarters. Suddenly he fiddles with that thing he wears in his ear, listens intently and says:

"Ladies and Gentlemen, we now have a winner in that OS sort-program race that has aroused so much interest across the nation. We predict that SyncSort will be re-elected handily with an impressive 54% of the vote.

"Trailing badly is the handpicked candidate of the powerful IBM Machine—SM1-5740, Release 3. Despite the fact the other IBM entries—SM1-5734 and SMO23—threw their weight behind Release 3, IBM's top-of-the-ticket candidate garnered only 36% of the vote.

"Will this be the last hurrah for that silver-haired, florid-faced sort known in so many of the nation's club houses as 'ICEMAN 3?' To find out, we take you now to the losing candidate's headquarters in beautiful downtown Armonk…"

Sorry, Walter, but we've known about these results for weeks now. Because this year, as in 1977, we commissioned those redoubtable poll-takers, the International Data Corporation, to find out for us.

They conducted a telephone survey to find out who uses what sort. The results—together with those for last year—are shown below:

SORTS USED BY OS & OS/VS USERS IN THE UNITED STATES

	July 1, 1977		July 1, 1978	
Sort Name	No. of Systems	%	No. of Systems	%
SyncSort	1,333	43%	1,836	54%
SM1-5740 (IBM)	992	32	1,224	36
SM1-5734/SM023 (IBM)	651	21	204	6
Other	124	4	136	4
	3,100	100%	3,400	100%

If you'll call, we'll be glad to send you a copy of the full report. It contains some interesting information on how data processors migrate from those venerable old IBM graybeards—SM1-5734 and SMO23—to SM1-5740, Release 3 and, eventually, to SyncSort.

The reason is not hard to find. Data processors are becoming increasingly aware of inflated "sorting taxes"—overuse of CPU Time, Elapsed Time and the other valuable computer resources that go into sorting. Show them a sort that does more work for fewer resources, and they'll vote for it.

Quicker than you can say "Proposition 13."

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Hague: CAP-GEMINI/PANDATA
Johannesburg: Computing Benefits Ltd.
London: GEMINI Ltd.
Melbourne: Shell Co. of Australia Ltd
Milan: SYNTAX
Paris: CAP/SOGETI PRODUCTS
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WHITLOW COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

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only 36% for IB

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WHITLOW
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Process Giving IBM 'Best Chip Yields Ever'

ESSEX JUNCTION, Vt. — Using an almost totally automated production process, IBM is getting the "best yields we've ever experienced" in the production of its new 64K-bit, 32K-bit and 18K-bit memory chips, according to Dr. Edward M. Davis, vice-president of the firm's General Technology Division here.

The yield on a batch of semiconductors is the amount of good or usable chips that is produced and is usually expressed as a percent of the total throughput of a plant.

And while Davis claimed that the exact yield IBM is getting in its new process is proprietary, he claimed it is better than the industry average for this point in the production cycle.

Although IBM did not announce the new chips until it unveiled the 8100 information system [CW Oct. 9] and the System/38 [CW, Oct. 30], it has actually been making them for more than a year.

The first engineering parts were delivered from pilot lines here in August 1976 and production of manufacturing parts began in June 1977, with volume production for inventory starting in January 1978, Davis said.

And the new 64K-bit unit is not just a memory chip — it contains several functions that would have otherwise required external support circuitry, he said. Since IBM is designing the chips from a total systems point of view, he said the firm made trade-offs in chip size in order to accommodate these additional functions on the chip.

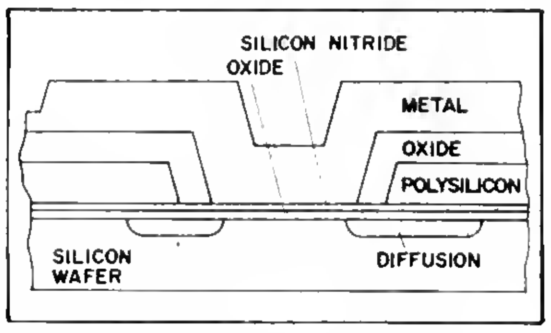
For example, the unit contains an 8-bit register capable of 100-nsec data rates, bidirectional data I/O bussing, and the ability to access data while refreshing, Davis said.

High Priorities

J.K. Picciano, advanced memory products engineering manager during development, said that in developing the new technology, the goals of high-density memory chips and manufacturability were given a high priority.

The technology for producing the field effect transistor (FET) devices and the majority of the interconnections in five masking steps is a simple process capable of very high yields, he said.

First, a doped-oxide layer is deposited, etched and driven into the silicon, forming the diffusions for the FET devices, storage nodes and diffusion interconnections. An ion implant is used for threshold adjustment, and the doped oxide is removed selectively where desired.



FET in IBM's New Process

Second, a thin layer of oxide, a layer of nitride and a layer of polysilicon are deposited in one process flow — resulting in a controlled method of making the gate insulator, oxide-nitride, and the silicon gate. This silicon gate later can be used as a field shield.

Third, the polysilicon is etched where contact holes, or gates, are desired and oxidized to insulate it from the metal layer. At this point, all contact holes are etched to allow contact to the polysilicon or silicon layers.

Fourth, aluminum-copper metallurgy is deposited and defined through a lift-off, rather than subtractive etch, process to provide control of the fine-line geometry.

Fifth, the chip is completed by adding a second metal layer. Picciano pointed out that polyimide is used in this process as part of the insulator and seal for the chip.

A feature of this family of chips involves the use of redundant lines and redundant functional islands to enhance early yield and manufacturability. Each chip contains several redundant lines and a fusible link read-only storage (ROS) on the second-level metallurgy.

By programming this ROS at final test, the redundant lines can be utilized to replace bits or lines that do not perform properly. Inhibiting of addresses and substitution then are performed totally on the chip without any change to its external operation.

In addition, the chips are organized with two or more functional islands. This allows use of redundant positions in the module package to further enhance productivity.

System/7s Controlling Operations

ESSEX JUNCTION, Vt. — In order to meet geometries as fine as 2.5-micron line widths, IBM is using 60 System/7 computers linked to a 370/168 to control almost all of the operations of its new semiconductor processing line here.

Seven of the System/7s are used just to monitor the locations of individual wafers, each of which contain 107 64K-bit or 32K-bit chips or 144 18K-bit chips.

The others control specialized processes, such as sputtering, evaporation or etching, along the line here.

As wafers are loaded into each section of the plant, they move along air tracks looking much like small frisbees to the various process points. At each piece of equipment, the wafers are held and identified by a laser and optical sense loop. If that wafer is scheduled for processing by that particular piece of equipment, it is then shunted into the processing device — again with all movements controlled by streams of air.

At all times, the System/7s are reporting information on the wafers to the 370/168, which in turn sends the data to a Manufacturing Operations Communications Center where it is displayed on a wall-sized mock-up of the entire plant. Each wafer that is on the line is identified and shown on the mock-up so that any slowdowns can be spotted immediately.

This extensive use of computer control has helped cut the learning curve in processing chips, IBM spokesmen hinted, because it provides complete information on the processes at all points in the line to identify bottlenecks or sources of errors.

IBM, Farmers Coexisting

(Continued from Page 1)

rays of the summer sun and cool breezes on their backs as they cultivate the corn and hay crops of the summer.

Now, with winter rapidly approaching, frost upon the land and light snow in the high mountains ringing this lake shore valley, their attention is on getting the wood in for winter, with huge cords of oak and birch falling under their splitting mauls to be placed in the rough-hewn sheds that dot the landscape.

And the other rhythms of farm life continue — rising before the sun to brave the cold on the way to the animal-warmed barns redolent with the smells of the cattle herds and the hay stacked high for the winter forage.

Startling Contrast

Nestled within this community of farmers and small shop keepers, the IBM plant offers a startling contrast, no worse and no better than the surroundings but certainly different.

The plant blends with the environment, standing brown against a brown landscape, set off on an access road by itself, and not at all overpowering the white clapboard houses and churches that make up the rest of the community.

But inside, the contrast with the surroundings is staggering.

Production line personnel wear white smocks, in many cases with hoods over their heads and special coverings for mustaches and beards, producing a feeling of uniformity and anonymity — a far cry from the various overalls, checked shirts, work pants and battered hats sported by the region's farmers.

No natural light penetrates the center of the IBM plant, which maintains a steady, flourescent glow day in and day out, night or day. But other lights dot the interior landscape: the purple glows of the deposition furnaces and the red glows around the darkened areas that house the photolithographic etching equipment.

And the sounds are different too; the gentle lowing of cattle or barking of dogs or songs of birds is replaced by an almost total silence, interrupted only by the clicking of solenoids and the hum of various pieces of equipment and the gentle sound of air moving in the cleverly designed air transport tunnels that move silicon wafers on their travels from their "raw" state to become completed memory circuits.

Antiseptic Environment

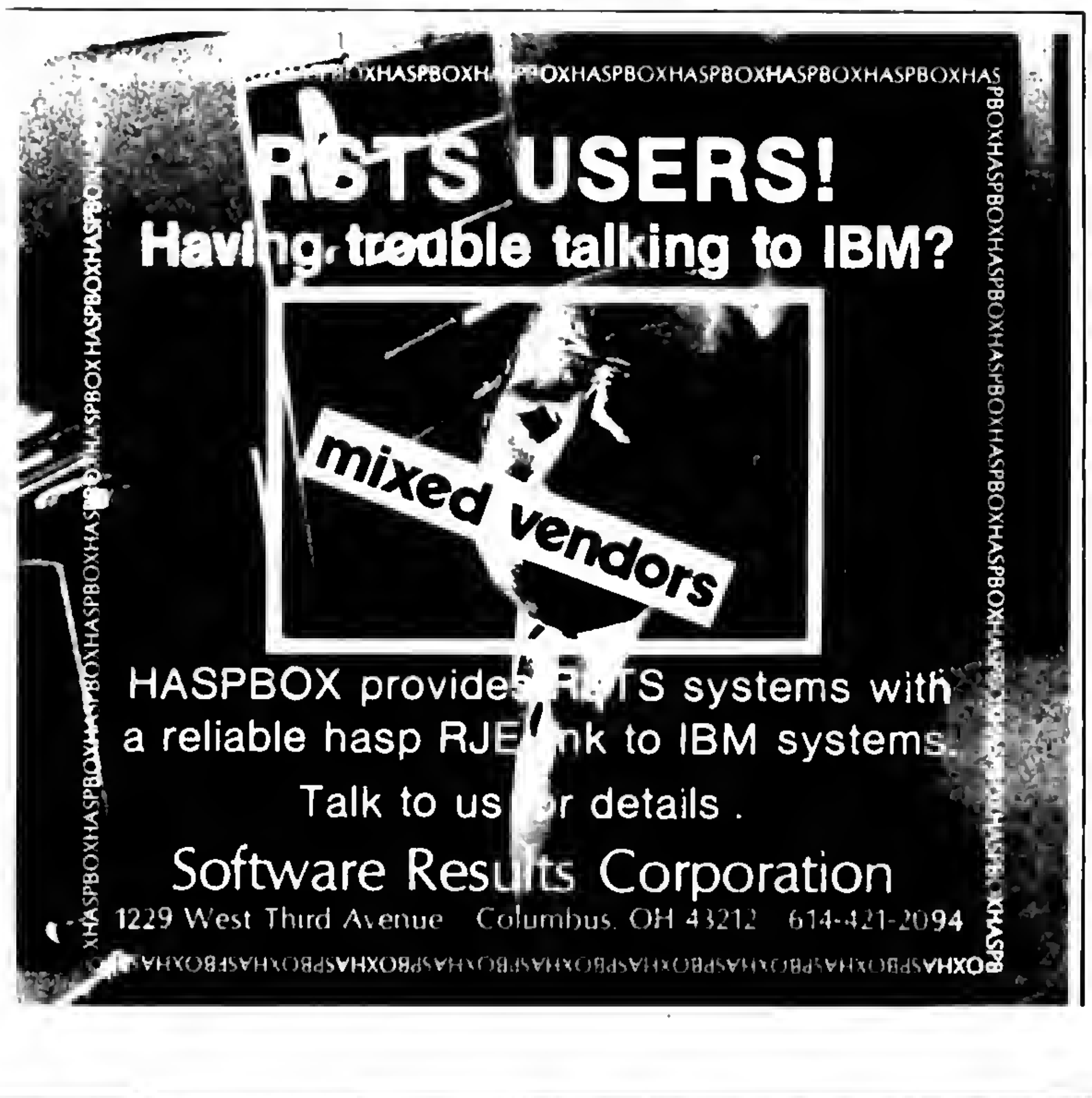
And no motes of dust advance and swirl, trapped within beams of sun. The atmosphere is antiseptically clean, a necessity with the close tolerances of the semiconductors made here, with dust or any other forms of contamination screened from the atmosphere.

The air tracks that transport the silicon wafers are so clean that there are only 10 parts of contamination in a billion parts of air. This would be like having a string of tennis balls stretching from the earth to the moon with only one of an inconsistent color.

The plant's pace is not determined by the seasons, but is under the direction of the 60 computer systems that monitor and control every process, following each wafer along its journey and alerting the operators to any glitches.

The Manufacturing Operations Control Center (Mocc) is the heart of the system, much as the kitchen is the heart of the farm home. Information is fed here from the process and monitoring computers and displayed on a wall-sized mockup of the plant.

The contrast between the inside of the plant and the pace of outside life is almost complete and surreal.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Thanks to Advance of DP

Ticker-Tape Parades Quickly Becoming Extinct

By Tim Scannell
CW Staff

NEW YORK – If a recent ticker-tape parade here feting the world champion New York Yankees baseball team is any indication, traditional forms of the celebration are doomed to follow the same route as gas street lamps, coal-powered bed warmers and the Model T – thanks to computer systems.

The ceremony, held in honor of the Yankees' victory over the Los Angeles Dodgers and capture of the 1978 World Series title, included the scattering of nearly 135 tons of paper along the city's half-mile designated parade route, according to Sanitation Department figures.

However, the bulk of the material tossed by the more than two million enthusiastic spectators consisted of computer punch cards, rolls of bathroom tissue and several shoes rather than the standard telegraphic paper ribbons.

City officials blamed the absence of ticker tape and the relatively small amount of paper generated by the parade on the advent of computers and their "paperless" processing.

Sealed windows in centrally air-conditioned skyscrapers were also cited as a paper-limiting factor during the recent parade.

The most paper produced from a ticker-tape event was 3,474 tons, which the city collected in 1962 during the parade for astronaut John Glenn, Sanitation Department records revealed. The return of Gen. Douglas MacArthur in 1951 was heralded by 3,249 tons, the second largest amount, and Charles Lindbergh's parade in 1927 generated 1,750 tons.

Firms Won't Follow Guides

(Continued from Page 1)

Since hardware production costs are dropping, the Carter price constraint should not trouble the industry except in labor-intensive areas such as maintenance and support, he continued.

The Carter plan may force the Administration to contradict itself, O'Kelly said. For example, "It's a bit ridiculous to have a 7% suggested guideline when 'we're already faced with a 9.4% increase in the minimum wage, effective Jan. 1."

The minimum wage hike from $2.65 to $2.90 will result in wage and salary hikes at all levels, he predicted. "In that case, which policy are we supposed to follow?"

Dim View

Texas Instruments, Inc. has taken a dim view of the Carter guidelines.

"We at TI concur with the spoken determination of the Administration to accelerate the fight against inflation. However, we think wage and price guidelines or controls represent an ineffective and wasteful way of fighting price increases," TI senior vice-president L.M. Rice Jr. has stated.

"Controls or guidelines, either voluntary or mandatory, have never worked in the past and there is no reason to expect them to do so in the future," Rice added. Nevertheless, TI plans to comply with the Carter program.

Business-sector cooperation "won't amount to much" unless federal, state and local governments cut deficits and improve productivity and efficiency, according to Brad Stroup, Data General Corp.'s director of financial and public affairs.

Stroup agreed with the other vendor spokesmen that federal government excesses are the source of inflation but called Carter's proposed federal worker layoffs and elimination of commercial safety/health requirements – which are said to dampen productivity – "trivial nitpicks."

"Success in the fight against inflation will require that the government must act," Rice continued. "We must put a ceiling on government spending as a percentage of Gross National Product. We must manage the growth of the money stock at a steady rate about equal to the average growth rate of physical output.

DG president Edson D. de Castro expressed the mini vendor's concern that "there may be a loophole in the guidelines. While Carter emphasized the need to boost productivity, he did not appear to indicate incentives for those who can do better than the guidelines.

"There should be some mechanism to allow companies to reward employees who can work to produce even better productivity price improvements than the guidelines call for," de Castro said.

Honeywell, Inc.'s chairman and chief executive officer, Edson W. Spencer has announced the vendor will "cooperate to the maximum degree possible with the President's program in holding down prices as well as salary increases."

At press time, with IBM, Univac, Burroughs Corp., Hewlett-Packard Co. and Digital Equipment Corp. abstaining from the CW poll, Honeywell and TI remain the only major computer vendors to pledge full compliance with the Carter controls.

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Times 'May Be a Changin' for DP Managers

(Continued from Page 1)

I was the first person from the DP environment to be promoted to the officer level," he said in an interview last week, "while today, out of about 800 officers, more than 85 came from the DP ranks."

Overlap of Roles

The delineation between top-level management and DP activity "is becoming fuzzy," he noted. "There are more officers in operating divisions of companies who do things that are largely in the DP business; to solve their business problems, they may use as resources not only the people they manage, but also a sophisticated DP system."

In the long term, management will be more willing to recognize the level of responsibility and complexity of the DPer's job, he said, but for this to occur, "the DP manager has to be more of a businessman than a technology expert."

The reason, according to Sitkin, is that the DP manager as a technologist only often cannot target the specific needs of his company. In the past, he noted, "I'd seen and heard descriptions of DP systems that were designed as an end in themselves — that is, to solve a problem, but not necessarily the problem the business, or user, faced."

Limiting Factors

A number of factors have limited the scope of the DP manager function, according to Sitkin. For one thing, he noted, people who teach computer science or who develop academic programs in computer science "still pitch the training to a much heavier machine orientation — for example, learning about the operating system and about programming languages — than to a business applications orientation."

In addition, he said, "It is very easy for a DP manager to become enamored with the technology because it is glamorous, there is a lot of it and it is constantly changing. Every day someone is knocking on your door with a new, wonderful system at a lower price.

"In the past, either the DPer was much more comfortable in the technological environment or management wasn't receptive to what contribution he might make at a senior or broader level. Back in the early '60s, many people complained that systems analysis and development work took longer than expected and cost too much money."

A New Breed

Today, however, a new breed of DP managers is coming to the fore, Sitkin maintained. Business schools and universities are graduating more people with an understanding of computers as well as business.

And with experience, DPers are gaining a better sense of their roles and responsibilities as they fit into the total corporate picture, he added, and are therefore communicating more effectively with their users.

Toward this end, the DP community over the years developed a number of tools to help its managers address users problems and come up with effective solutions, Sitkin said, citing the phase development approach which has been used at Aetna since 1971.

This approach breaks down the problem-solving process into a number of phases: problem identification, feasibility of a mechanized (or any) solution, preliminary system design, actual system design, programming, test, installation and post-implementation review. After each phase, the user and the system developer communicate as to progress made and the direction subsequent steps should take.

At Aetna, Sitkin developed an executive training program in the early '60s designed to "remove the mystique from the computer and open up the communication channels between DP managers and users. During the program, corporate managers down to first-line supervisors interact with DP personnel to describe and identify problems and jointly participate in developing mechanized solutions," he explained. The course was updated about two years ago and is offered every three or four months.

As the DP manager defines his role more in terms of a total business orientation and less in terms of technology, he will gain more upward mobility, Sitkin predicted.

"The contribution I make at Aetna is as a businessman and manager of resources, rather than as a super technology wizard," Sitkin noted. "In the future, more DP people will be selected for such high-level positions as chief operating officer because of their understanding of business and not because they are good technicians."

Managers Told Not to Feel Limited to DP

(Continued from Page 1)

to move from a DP management to a general management spot, according to Jerome W. Geckle, president of Peterson Howell and Heather, Inc., a business service bureau.

This intelligence must be applied to an understanding of people, Geckle told the session entitled "DP Arrows Are Pointing to Management — Don't Lose Your Way." The manager should realize that people are controlled by emotions rather than facts, he said, indicating that people are seldom manageable purely by strength of argument.

"Technical excellence does not make you a manager; it can only get you half way," Geckle added, noting that "superstars" rarely succeed as administrators.

The test of a manager is whether he can deliver results Geckle continued, explaining that the end is generally more important than the means in a business environment.

Geckle told the session that distributed data processing (DDP) is a marvelous opportunity, not a crisis, for commercial administrators. DDP will enhance the manageability of regionwide or nationwide organizations as it proliferates in the next decade, he said.

The successful manager understands the business of his organization — "That's the name of the game," according to John L. Jones, Southern Railway's assistant vice-president of management information services.

The successful manager must also understand the "management style" of his firm, whether it is autocratic or committee-oriented, Jones continued. Further, corporate management should understand what he is trying to do.

Image Problems Described

(Continued from Page 1)

national product manager came in sharp contrast to predictions made at other conference sessions that the DP manager has a good crack at top management spots, including company president.

"We are stunting our growth and we don't realize it," Simone declared, explaining that DPers are "scaring people away" by "talking funny" and that DPers are seldom seen as contributing to the corporate objectives. If DPers want to move up in management they must demonstrate a personal contribution to the firm's profits, Simone advised the session.

Other departments, such as marketing, are usually considered a far more significant contributor to profits; that is why company presidents tend to come from these departments, rather than DP, he observed.

For this reason, DP managers with an eye on top management jobs should continually demonstrate their worth, Simone said, indicating that non-DP executives need to be educated in the relationship between DP and total company progress.

The ambitious DP manager should eliminate buzzwords in his conversation with others and strive to generally improve his communications skills, he advised.

As technology progresses and the state of the art advances, DPers should hold training seminars to spread the news of what has become available to the firm's other sections, Simone continued.

Further, DP managers ought to continually review DP budgets, eliminating unnecessary expenses — for example, extravagant card reading systems in a nearly cardless shop, he said.

Finally, the upward-bound DP chief needs to find out where the company is going and what new products and services will develop, Simone added.

Whether or not the top ranks are reached, these recommended steps will improve the DP manager's perceived contribution to the organization as well as win greater job satisfaction and personal pleasure, he asserted.

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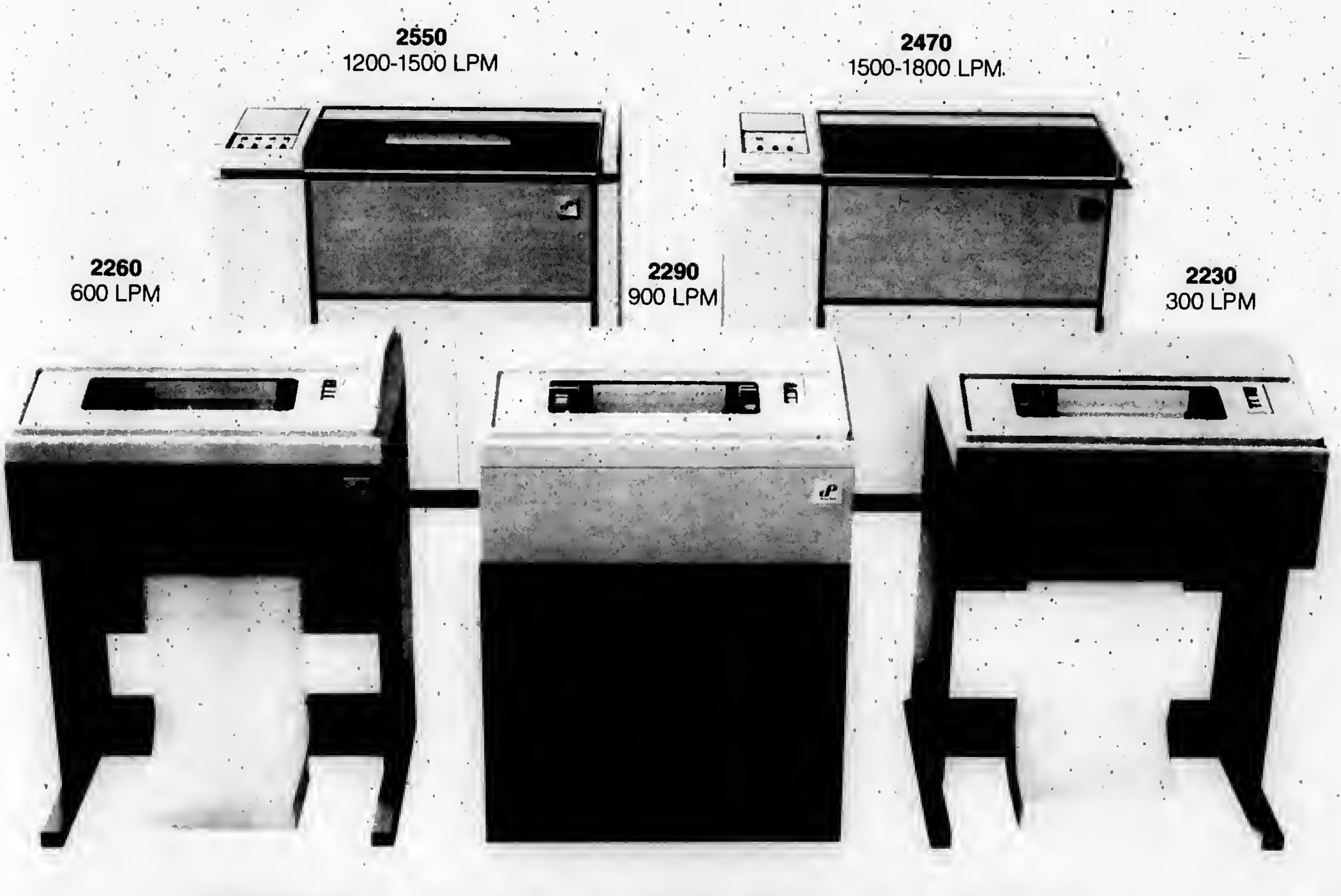

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Hardware Snags Stymie Operations at O'Hare

(Continued from Page 1)

out 19 hours after the system first went down. The cause of the ARTCC computer problem was still under investigation at that time.

Beginning of Problem

The problem began at 9 a.m. when the computer system at the O'Hare control tower, based on two specially built Univac 8303s, went down, Scholz noted.

Arts III generates a display that is superimposed on the radarscope, identifying an airplane by airline name and number and providing its ground speed and altitude.

When that system goes down, the greatest impact is felt in the first few minutes when air traffic controllers must adjust from a visual to a mental 3-dimensional picture of where the planes are, Schulz explained.

However, the failure of the O'Hare system alone did not cause the serious problems on the runways, according to Warren Webber, data systems officer at the control tower. "It wouldn't have made the big impact that it did if the center's [ARTCC] computer had kept working," he noted.

The ARTCC in Aurora, about 30 miles west of Chicago, is one of 26 control centers in the U.S., Scholz said. The Aurora center employs 600 air traffic controllers and has jurisdiction over 185,000 sq. miles of air space in the Midwest.

Circulation of Flight Data

Control centers pass information on scheduled flights through several points between airports as planes enter and leave their jurisdictions. Information includes flight number, type of aircraft, altitude, air speed and estimated time-of-arrival at the next control center.

This information is imparted in two forms — by radar and printed out as flight strips, Scholz explained.

The flight strips are backup for the radar, he said. "If the radar stops, the air traffic controllers should be able to keep the airplanes separated at different altitudes using the strips," he pointed out.

But when the ARTCC computer went down, the center lost not only the digitized radarscope displays, but also the flight strip data.

Those losses necessitated writing out flight strip information in longhand, a process that is "fantastically slow compared to the computer," according to Terry Anderson, air traffic controller and Patco representative at ARTCC.

The information on the flight strips must be received by an air traffic controller before he can accept an arriving airplane, so he can maintain the 5-mile minimum spacing requirement between planes, Anderson explained.

Reason for Delay

Because flight data had to be processed manually at the ARTCC, slowing down the rate at which aircraft could be accepted for en route control, take offs were stretched out at O'Hare airport.

The center has an IBM 9020E which, "either because O'Hare's computer was down or because they couldn't shut off the information that was supposed to go to O'Hare's computer," malfunctioned by building up information in its memory instead of passing it to a "drop," Anderson said.

By about 1:30 p.m., Anderson said, the 9020 was working at 80% storage capacity, and by 4 p.m. it was working at 95% capacity. At that point a number of functions, including the center's radar, were nonoperational, according to Anderson.

'Flops' Not Successful

Center personnel at that time "flopped" the machine, in other words, emptied it of information in an attempt to reject whatever was causing the problem, Anderson explained.

Within one hour, however, it was again working at 95% capacity so 20 minutes later they flopped it again, inputting only "live" flight plans, Anderson said.

Although the technique again did not work, by 8:30 p.m. air traffic began to subside, making it easier for the computer to function, Anderson noted.

A combination of heavy air traffic and poor weather conditions compounded the problem, Anderson said, but there have been times in the past when more traffic information has been fed into the computer than there was that day "and we've never had that problem."

A week later, although the cause of the center's problem still had not been found or corrected, it was operating at an "acceptable level," Anderson said.

Problem Investigated

The 9020's problem was then being investigated by Chicago center personnel in coordination with technical specialists from the National Aviation Facilities Experimental Center (Nafec) in Atlantic City, according to Callahan, the FAA's public affairs officer.

"Our major concern is that this situation could very well happen again tomorrow or the next day," Anderson observed, given the factors of heavy traffic, poor weather conditions and Arts III going up and down, "none of which is a rarity."

According to Scholz, O'Hare's computer system failed on 46 days in 1977 and on six days during the first two weeks of 1978.

Backup Demands

Demands for a backup system and new software testing procedures at O'Hare were made in a lawsuit filed in 1975 by 63 O'Hare air traffic controllers against the FAA, the Civil Service Commission and the Department of Labor.

The trial took place in January 1978, and a decision is still pending. In light of the recent computer failure, last Monday the air traffic controllers filed an affidavit with Federal Judge John Powers Crowley asking for a quick decision in the case.

Donald Duck Paid by HUD

(Continued from Page 1)

The system should have rejected the $99,900 check on its face value, because maximum federal pay is currently $47,500. However, the HUD payroll system does not have any limit checks; salary amounts are limited only by the number of digit fields, Cronin noted. "If we decided to pay Donald Duck $100,000, it would have been truncated and he would have gotten nothing."

Despite a 28-year-old law requiring that all federal accounting systems and those that are later modified be approved by the GAO, 40% remain unapproved, according to Cronin. "The HUD system was approved in 1970," he noted, "but many of the edit checks that were supposed to be in the approved design had disappeared from the operation.

"We were told by some of the people there that they ran into a problem with core storage capacity and had to drop out a lot of the edits.

"In a case like that, we see only two alternatives — either don't drop out the edits or figure out some way to increase capacity. Some computer systems can be added to, such as with disk pack storage units, but I don't know whether that alternative was explored at the time," he said.

The software programs for most federal payroll systems are written by the agencies themselves, Cronin said, adding that many also use modified versions of programs from other agencies.

Taken by Surprise

The GAO findings from its "Walt Disney" experiment took HUD by surprise, he said. "HUD felt, however, that its own output reports — on who got paid and how much — would have disclosed the erroneous $99,900 figure, which would then have been brought to someone's attention and questioned.

"We felt that it shouldn't have gone that far," he stated, "and should have been stopped in the initial input stage."

A fraudulent transaction is not the same as an erroneous transaction such as the $99,900 check, Cronin explained, "and a computer should reject an erroneous transaction. A keypunch operator could make a mistake and whether it would be spotted by a manual check is somewhat speculative."

If, however, a HUD employee knew the payroll system and decided to up his salary to $40,000 — which is within the federal salary limit — this would be a fraudulent transaction and would go through undetected, he added.

Recommendations to HUD

While the GAO, as an auditing and investigating body, does not have authority to implement controls at the various agencies, it did make some recommendations to HUD based on its findings:

- That the agency increase controls over source documents and time and attendance records.

Often, Cronin said, these documents are processed without the necessary approval of regular hours or authorization of overtime hours, and even after they are approved, individuals have been able to change the number of overtime hours.

- That it separate the duties of payroll and personnel employees.
- That it improve controls over computer processing and record maintenance.

This last recommendation, according to Cronin, called for several changes: to better control the use of dummy Social Security numbers; to remove or segregate from the master pay file the records of employees that have left the agency; to impose better edit checks; to periodically reconcile personnel and payroll files; and to improve physical controls over computer programs.

According to Cronin, HUD's computer programs were kept in the computer room rather than in a restricted area like the tape library.

In 1976, GAO submitted a report to Congress stating that the more than $40 billion in transactions generated by government computer applications were not adequately checked and that this caused errors that could cost taxpayers "tens of millions of dollars" yearly [CW, May 17, 1976].

Unless Procedures Improve

DP Contract Litigation Viewed as Booming Area

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Computer contract litigation should be a booming field for years to come, considering the sorry state of existing DP contracting procedures.

That was the consensus of participants at a recent meeting of The Computer Law Association here that featured speakers representing both users and suppliers of DP services and equipment as well as attorneys specializing in computer law.

The speakers, brought together Oct. 16 to discuss "Contracting in the Computer Industry," also concurred that litigation over DP contracts is almost never beneficial to either user or supplier and, in most cases, could be avoided through better contracting procedures.

No-Win Situation

"The last thing in the world we want is lawsuits; what we want is performance," according to Roy N. Freed, a partner in Powers & Hall law firm, Boston, and a specialist in computer systems and software contracting.

"Litigation is a no-win situation," Freed remarked. A lawsuit "can never really compensate an unhappy user."

Agreeing with Freed was Edward F. Langs, Burroughs Corp.'s legal director, who said "contract negotiation should not be an adversary proceeding."

Several of the speakers suggested most DP contracting problems could be avoided if the user would prepare a detailed list of specifications for the job he needs done and then seek a guarantee that the product will meet those specifications from the supplier.

"Creating realistic performance specifications is beneficial to the customer and the supplier," according to Freed, who said it "astonishes" him that so many users are unwilling to identify how they will use the product for which they are contracting.

"The major problem in computer contract negotiations is the lack of a user statement of wants and needs," Langs said. The user should be "very, very specific in defining needs."

A warranty on specifications, he added, would be better for the user than some types of warranties commonly used today. He gave as an example warranties on uptime percentages.

If a customer asks for a guaranteed uptime percentage that is too high, he explained, the vendor's field agents might end up "watching the clock" while performing maintenance and be more likely to do a quick "patch job" when a major repair is needed.

Langs also said that a problem often arises because of lack of standard definitions in contract terminology. "If you want your specifications [met]," he advised hardware users, "Use language everyone can understand." This is especially important in case there is litigation over the contract later, he added.

Acceptance Testing

Speaking from a user's viewpoint, John A. Gosden, vice-president of corporate computer services for The Equitable Life Assurance Society, said once a user has decided on his specifications, the next critical step is acceptance testing.

On this subject, Langs pointed out that hardware vendors often welcome acceptance tests because they allow the vendor to determine if he can meet the user's requirements. Such an understanding before the contract is drawn up and signed can prevent later litigation, he noted.

Freed explained that a user needs not only an initial acceptance test, but periodic testing to assure system compliance with performance specifications over the term of the contract.

Turning to contracting for software, Paul S. Hoffman, a New York attorney specializing in computer law, said a software vendor must be "careful to avoid overkill." The vendor should not demand a contract so unreasonably strict that it might be thrown out of court if litigation arises.

A software user must also beware of the restrictions in vendor contracts, he said. The user must make sure he can live up to the terms of the software license and not be "in technical violation from Day One" because of restrictive contract conditions.

Trade Secret Issue

A major item in computer contract negotiations discussed by The Computer Law Association panel was the trade secret provision. Gosden, in his presentation, insisted that the DP customer has a right to "practical trade secret rules."

Hoffman noted that getting trade secret protection for a vendor "depends a lot on how a company operates." The vendor must act as if his product is secret.

Suggesting several steps to take in that direction, Hoffman said the vendor should:

- Establish an internal security program.
- Obtain confidentiality agreements from employees.
- Remind employees not to leave se-

(Continued on Page 10)

At last, an easy way to increase productivity in a COBOL shop

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In actual practice, the large companies with the big budgets spend many thousands of dollars for seminars and inhouse training materials. They set up task forces whose job it is to develop a system and establish standards for using the new techniques. They devote many man-months of programmer time for retraining. And when the dust settles, it's only the unusual shop that shows any real improvement in productivity.

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The first book, *Structured Programming for the COBOL Programmer*, is a training text. It presents a complete system for using the new productivity techniques in a COBOL shop. This system includes top-down design, structured coding, and top-down testing. This book is in use in hundreds of companies, both large and small, and we guarantee you can learn everything you need to know about the new productivity techniques using the book alone.

The second book, *The Structured Programming Cookbook*, is a reference book for use after training. It gives complete standards for developing structured programs in a COBOL shop. And it gives complete design, documentation, and coding for four business programs. By reducing program re-invention, these model programs can have a major effect on programmer productivity.

If you haven't started using the new productivity techniques in your shop, Paul's books may be the best investment you'll make this year. On the other hand, if you have experimented with the new techniques but you aren't satisfied with the results, please review these books. They have already helped many other companies turn theory into practice.

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"Your books provided valuable input to our installation standards manual that we have been developing during the past year."

A programming manager in Colorado

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DP Crime Blamed on Dummies, Not Thieves

CW at DPMA

By Brad Schultz
CW Staff

NEW ORLEANS — As a threat to data security, "the dummies have it over the thieves hands down," a session of the 1978 Data Processing Management Association (DPMA) conference here last week was told.

IBM security expert Robert Courtney told the session entitled "A Rational Approach to Data Security" that carelessness and stupidity constitute the number one threat to the safety and integrity of computer-stored information, while espionage and embezzlement are far less common.

Courtney defined "data security" as safety from accidental or intentional modification or destruction of data.

A major organization recently suffered from bungled data management involving records of obsolete equipment the organization owned, Courtney said. The computer system that stored these records was programmed to automatically order more of the obsolete equipment in the event its supply dwindled to nothing.

A top-level management team ordered the equipment to be sold without advising the system auditor, thus all the obsolete materials were reordered and restocked.

Dishonest employees constitute the second greatest security threat, Courtney continued, adding that computer rip-offs are almost always "inside" jobs.

White collar computer crime does not usually cross functional boundaries, he observed, explaining that abuse in a department — accounting, for example — is usually perpetrated by a member of that department.

Courtney called fire the third-ranking security risk, adding that companies frequently underestimate this risk when installing computer systems in tall buildings.

For example, a firm might install a CPU on the 60th floor of a very tall building under the assumption that fire is likely to occur on that floor once in 300 years. The firm does not realize fire, much more likely to occur on lower floors, will knock out electrical flow to the CPU, he said.

The fourth greatest risk is the disgruntled employee. Generally acting under acute emotional strain, this individual can destroy records and even equipment worth millions of dollars, Courtney told the session, noting that some enraged workers have blasted peripherals with firearms.

Beware of Water

Rating water as the fifth worst danger, the IBMer said burst water pipes, overflowing upstairs sinks, broken sprinkler heads and similar malfunctions have caused far more damage to computer hardware than floods and other natural water disasters.

He told of one user that installed several CPUs in a hillside structure with a slightly sloping floor to permit drainage through a hole in one wall. Unfortunately the user made the draining wall face the hill's summit: The next rainfall caused water to run down the hill, enter the drain from the outside and flood the facility.

At the first sign of leakage in the proximity of a computer system, a user should power down the system and wrap it in a polyethylene sheet, Courtney advised, adding this sheet typically costs about $15 and should be kept on hand for such emergencies.

Finally, the sixth most serious security threat is the ego tripper, he said, explaining that such people have wrecked systems by trying to implement elaborate modifications as show-off stunts.

Three Ways to Get In

Courtney also described three means of permitting access to classified computer-stored information: "things you know, things you are and things you have."

Passwords epitomize the first category and are among the least effective methods of access control, he said, since programmers often tell their passwords to colleagues.

Under "things you are," Courtney included fingerprint, voiceprint and similar means of physical identification. This method entails permission of access upon successful matching of sample and library records; for example; the thumbprint of the user must match the thumbprint of his claimed identity.

The last category includes identification cards that are inserted in special readers. Such cards often provide too much information, Courtney said, and can thus be dangerous in the wrong hands.

Cards should carry only embossed numbers, excluding information that could assist impersonation, he explained.

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Litigation Booming

(Continued from Page 9)

cret material out in the open.

- Obtain a secrecy agreement before releasing secret material to prospective customers.

The last point is especially important when the prospective customer is the federal government. Hoffman noted.

The software vendor should make sure the user has appropriate safeguards over licensed products, Hoffman continued. The vendor should also know the physical location of his product and have the right to inspect the user location, he said.

These steps are vitally important, according to Hoffman, if the vendor ever has to establish the right to trade secret protection in litigation.

Preventing Software Theft

Hoffman also urged software vendors to make sure licensees will help prevent software theft. It is better to include the user in the vendor's security program than to claim damages if the product is stolen from the user's premises, he said.

Freed agreed, saying that legal means of protecting trade secrets do nothing to actually protect the product; they only provide for specific legal consequences if there is a theft.

Langs suggested that users not "ask for too much" in contract negotiations. It does no good to "provoke a war" over every item in the contract.

He also suggested users should *want* vendors to make a profit. There are grave consequences for users when major hardware vendors leave the marketplace, he explained.

Countering that argument, Freed said a vendor should consider its contract as a "marketing opportunity." It's only good business, he observed, to consider the needs of the user.

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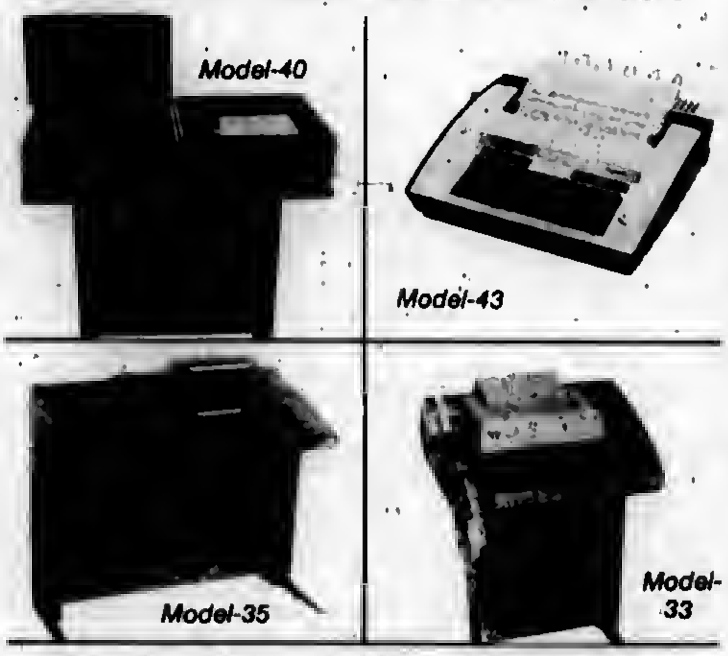

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Sources of Revenue For IBM Plotted From '73 to '82

With this chart, the Technology Analysis Group (TAG) of Advanced Computer Techniques Corp. (ACT) and *Computerworld* initiate a "Chart of the Month" feature.

In or about the first week of each month, ACT/TAG will generate — and CW will publish — one chart depicting information such as selected industry measures and trends, the relative positions of various DP vendors, technological developments and their projected impact upon users and manufacturers and fluctuations in the economy's DP sector as these relate to the national and international marketplaces.

The basic objective of each chart in the series will be to synthesize and interpet various data that together constitutes a unique commentary on, and "snapshot" of, computer industry events of importance to the DP community. One particular goal of the ACT/TAG charts is to direct the reader's attention to informational interrelationships that might not otherwise have been apparent.

Chart of The Month

This chart projects trends in IBM revenue sources and is principally derived from IBM's FY78 "10K Report." It projects where IBM revenues are expected to come from in the next four years.

For those inexperienced in the arcane world of IBM divisions, following is an explanation of abbreviations: DPD: Data Processing Division; GSD: General Systems Division; OPD: Office Products Division; FSD: Federal Systems Division; and SRA: Science Research Associates.

Other abbreviations include R&S: Rental and Services; FE: Field Engineering; SE: Systems Engineering; and PSR: Programming Support Representatives.

It is interesting to note that while revenues from rental of computer equipment are expected to remain relatively flat for the next few years, IBM is expected to make significant increases in the sale of computer equipment and in the revenues generated by software and services.

In fact, the software and services area is clearly the fastest growing within IBM and is expected to continue its rapid growth, particularly with the recent advent of unbundled operating systems on the 8100 and System/38 computer systems.

This rapid growth will enable the firm to continue its record of growth in earnings and revenues, even while the importance of hardware sales declines as a part of the firm's overall revenue.

ACT is perhaps best known to CW readers in the person of its president, Chalres P. Lecht, whose recent book, *The Waves of Change*, first appeared in print as a series of illustrated excerpts in CW issues from April to October 1977. Lecht's work-in-progress, *Tsunami*, is appearing in installments in CW this year.

Many of the charts and figures that contributed to the value and success of both *Waves* and *Tsunami* were generated expressly for them by TAG, which now brings the "Chart of the Month" to *Computerworld*.

Further information pertaining to ACT/TAG can be obtained by writing directly to TAG, Advanced Computer Techniques Corp., 437 Madison Ave., New York, N.Y. 10022.

— — —

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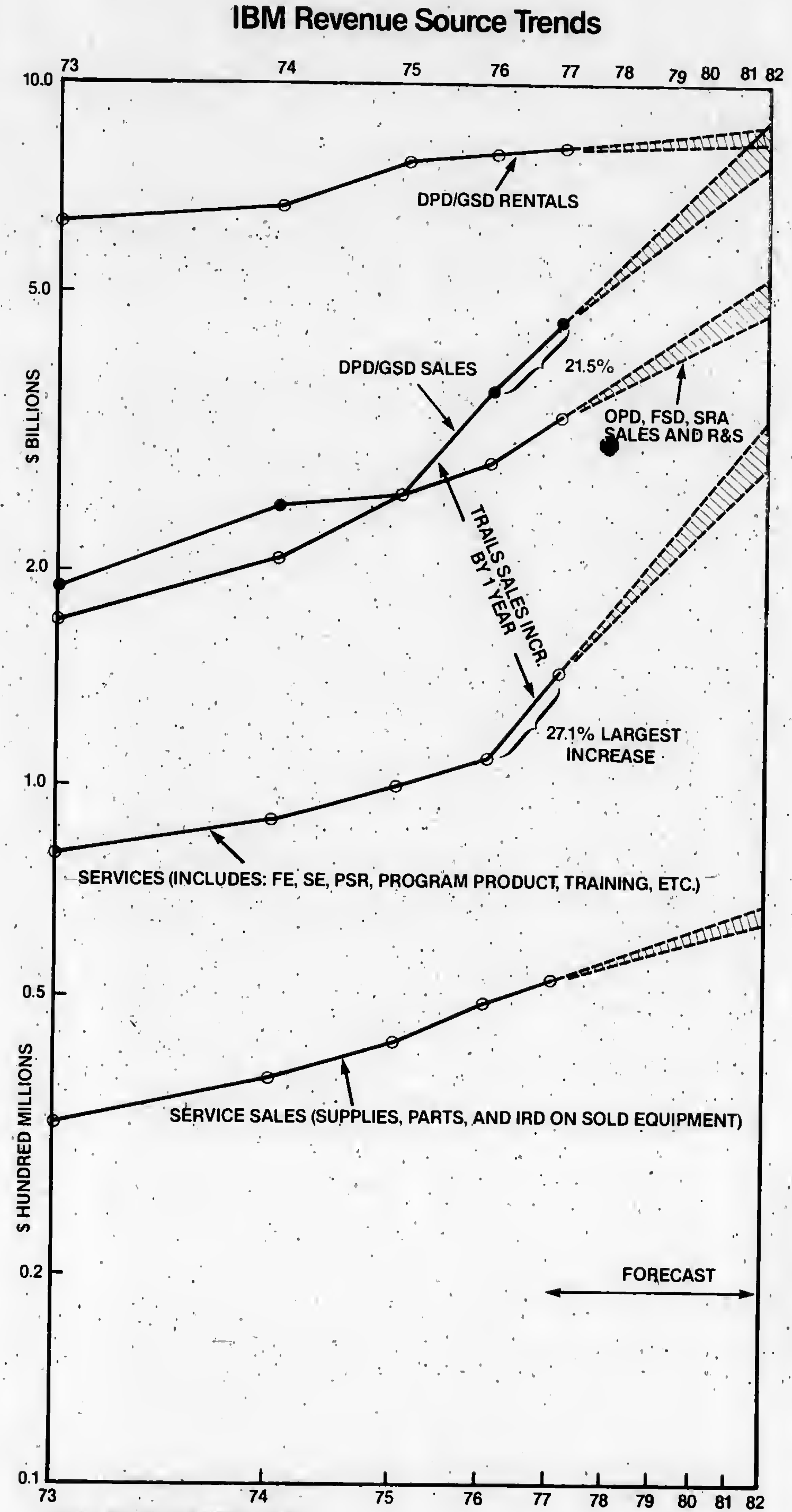

IBM Revenue Source Trends

	73	74	75	76	77	78	79	80	81	82
TOTAL REVENUES ($BILLIONS)		12.7	14.4	16.3	18.1	20-21		22-24		25-28
PERCENTAGE CHANGE				13%	11%	15%		22-25%		15-18%

SOURCE: ACT/Technology Analysis Group (TAG)

*Excludes other or miscellaneous revenues

Business Programmers in Great Demand

Bright Future Forecast for Most DP Job Types

By Brad Schultz
CW Staff

NEW ORLEANS — Qualified applicants in most DP job categories are in demand and will stay that way into the 1980s, a session of the 1978 Data Processing Management Association (DPMA) conference here was told last week.

Sam W. Love, Houston and New Orleans branch manager for Source EDP, an industry placement bureau, told a session entitled "Career Planning for the Data Processing Professional" that commercial programmers are in "exceptionally high demand"; in fact, business DP managers should intensify programmer training to offset a labor scarcity likely to continue for years.

CW at DPMA

The proliferation of the mini- and microcomputer systems in the private sector has created a wide range of commercial software activity; many first-time users are now searching for competent programmers with a business background, Love said, adding that a business baccalaureate is usually preferred.

However, scientific programming is the one DP specialty undergoing a fall in demand, Love noted, explaining that engineers and scientists usually develop programming skills as undergraduates and thus have little need for full-time scientific programmers on their technical projects.

A B.S. in engineering, mathematics or a natural science is now commonly required of entry-level scientific programmers, Love added, and a master's degree is preferred.

Systems software programmers are in high demand by vendors and consultants, especially programmers with data base or teleprocessing experience, he continued. Proficiency in assembly as well as in high-level programming languages is usually mandatory.

Wanted: 'Practical Thinkers'

The growing popularity of financial and economic modeling as a tool of management science means programmers who are "practical thinkers" and "profit-oriented" are attractive to consulting firms and government agencies, Love indicated, adding that a master's degree is also often desired for this specialty.

In addition to technical competence, senior analysts, DP project leaders and consultants must have polished interpersonal and communicative skills, he told the session.

Love called DP auditing an attractive career path for finance personnel who want to enter the DP world or for DPers angling for more financial exposure.

Other professionals rated in high demand: technical services managers, systems and programming managers, data center operations managers, information systems directors, marketing representatives and marketing managers.

Managers cannot function, however, without strong interpersonal acumen and leadership traits, Love observed, adding that marketing representatives are typically extroverted and aggressive.

High Pay, No Growth

Many organizations are coming to realize that not every DP professional wants to become a manager, Love noted. In many shops, certain DP technicians are now earning more than managers.

However, a number of technicians have become trapped in highly paid positions with no chance of development, and these professionals are among the first to go in the event of layoffs, he said.

Love told the session that "many times an individual's personal plan for reaching his potential does not take into account facts relative to his own technical and personal skills, education, industry work experience and the age old duo — supply and demand."

He advised DPers to accurately appraise what they want in life, to focus on what is relevant to their personal goals and to "have fun; take a chance."

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Precollege Training Under Study by ACM

EUGENE, Ore. — The Association for Computing Machinery's (ACM) Elementary and Secondary Schools Subcommittee wants help in developing guidelines for precollege-level instruction in computer science, an ACM spokesman said.

The guidelines are intended to assist in teacher training as well as facilities planning for elementary and secondary schools, ACM explained.

Interested persons should contact the subcommittee's chairman, David Moursund, at the Department of Computer Science, University of Oregon, Eugene, Ore. 97403.

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As Hardware Outlays Rise

IBMer Predicts Drop in DP Personnel Budgets

By Brad Schultz
CW Staff

NEW ORLEANS — The average DP center can expect larger hardware and communications budgets but smaller DP personnel budgets in the years ahead, according to B.C. Christensen, IBM World Trade Corp. vice-president and general manager.

In his keynote address at the 1978 Data Processing Management Association (DPMA) conference here last week, Christensen said falling DP personnel budgets will result from data entry moving outside the DP center, end users becoming more involved in applications development and increased DP personnel productivity through coming applications development tools.

The growth of hardware expenditures is a worldwide phenomenon, Christensen said. "The rule of the game is no longer to squeeze as much as you can out of a very expenisve piece of hardware through an extensive use of affordable manpower.

"It is, rather, to use less costly hardware and contain soaring manpower costs. The DP industry is the only one I can think of in which costs have consistently decreased while inflation was playing havoc with our economies," he said.

CW at DPMA

Preserving Independence

A number of countries can preserve their independence in the face of economic instability only by subsidizing local DP vendors, he asserted, adding "these efforts . . . put a heavy burden on the national communities in direct subsidies."

In the future, telecommunications and computer technologies will merge, Christensen said, and superconductivity physics will provide "10 to 100 times faster circuits, consuming only one one-thousandth as much power.

"Bubble memories should allow cost-per-bit 10 times lower than silicon memory devices," he continued, "and access times that are 10 times faster than magnetic disk files."

IBM's Organization

Christensen told the conference that IBM has made "a three-part division of the world."

IBM Corp. will serve the U.S. market, which accounts for one-half of the vendor's total revenues.

IBM Europe/Middle East /Africa Corp. has assumed "responsibility for IBM's business in 80 countries — from Norway's Cape North to the Cape of Good Hope, and from Greenland to Vladivostok." This enterprise accounts for about one-third of the vendor's total income, Christensen said.

Finally, the IBM Americas/Far East Corp. is "responsible for business in North and South America, excluding the U.S., as well as Asian countries to the east of Pakistan."

General Business Group

There is also a "separate organization" called the General Business Group, which has been assigned office products and "small systems," he explained.

IBM executes research and development on a global scale to exploit local talent, allow scientists to remain in their home countries and avoid duplication of effort, he said.

However, manufacturing is organized on a regional basis to obtain economies of scale and uniform product lines, while gaining a degree of decentralization tailored to the local situation.

Marketing is conducted on a national level, Christensen noted, explaining, "It's clear that the country units know their markets best" and that, for example, "a German marketing rep can best deal with a German customer."

Price/Performance Improvements

"Dramatic price/performance improvements and technological progress have brought down hardware costs to a point where new applications from the customer's backlog can be installed with an acceptable return on investment," he continued.

Demand for computer products has risen as a result, spurred also by "the sheer growth in volume among applications already in operation" as well as the expansion of applications to other areas of business.

A third reason for the climb in demand for DP goods and sevices is the proliferation of digital communications facilities. "The computer is no longer a sacred monster accessible only to the priests of the data processing religion. Everybody can now talk with it, work with it," Christensen told his audience.

He added that most computer activity tends to be concentrated in the first shift, when users are there. The need for backup systems and high reliability has risen, therefore, reflecting the increased on-line usage. Hardware demand has risen with the need for backup resources and high reliability, he concluded.

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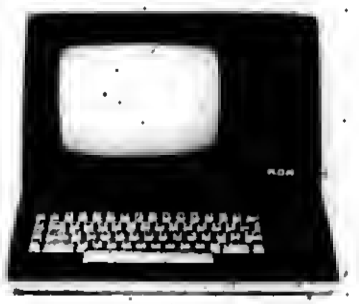

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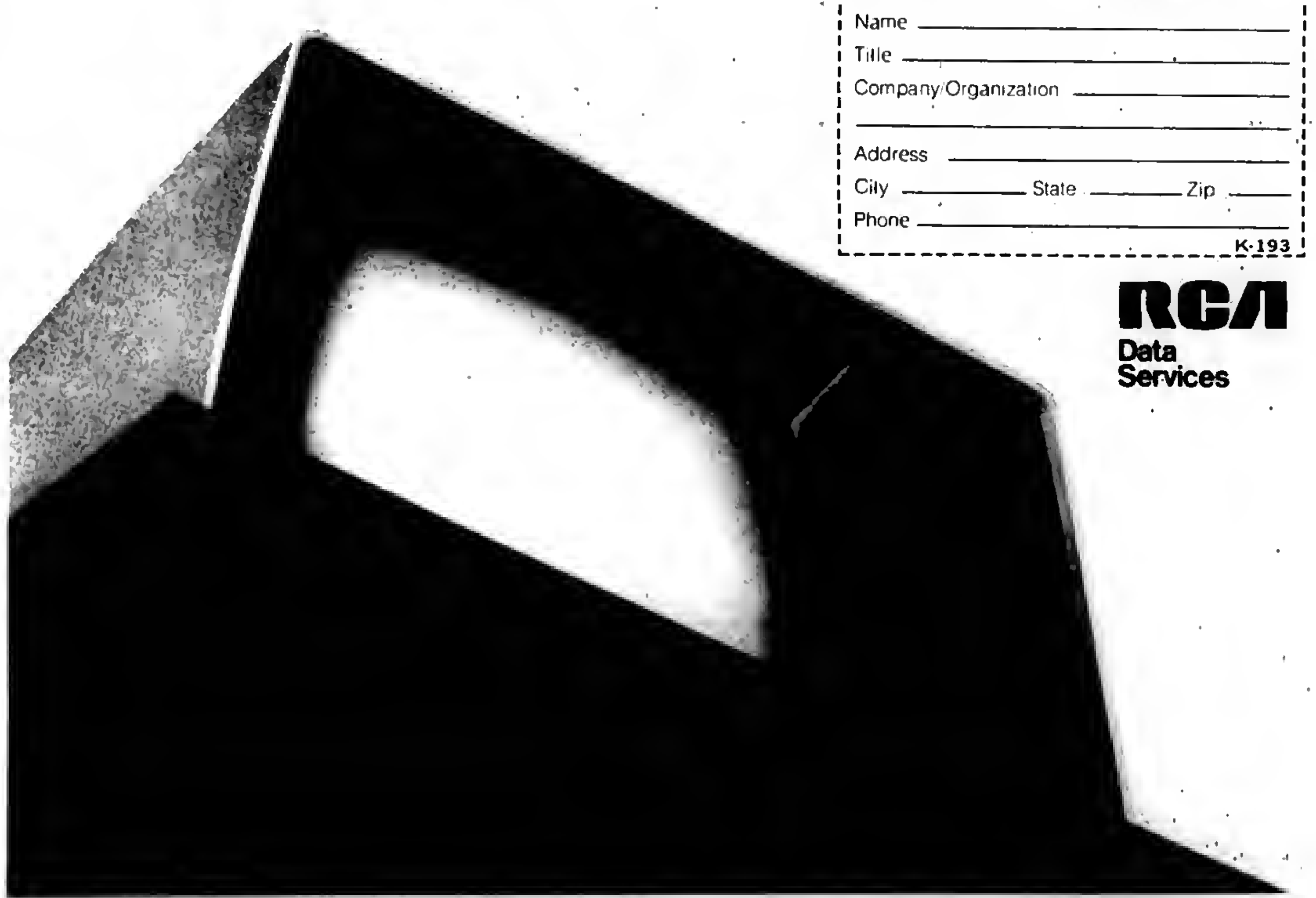

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Calendar

Nov. 13, Tulsa, Okla. — **Meeting of the Southwest Computer Measurement Group (SWCMG).** Contact: Connie Smith, SWCMG General Chairman, Texas Department of Human Resources, John H. Reagan Building, Austin, Texas 78701.

Nov. 29-Dec. 1, Los Angeles — **Technical Documentation II Conference-Workshop**, sponsored by Graphic Communications Computer Association. Contact: Graphic Communications Computer Association, 1730 N. Lynn St., Arlington, Va. 22209.

Dec. 1, Palo Alto, Calif. — **California Computer Show.** Contact: Norm De Nardi Enterprises, 95 Main St., Los Altos, Calif. 94022.

Dec. 4-5, Washington, D.C. — **Understanding Proprietary Software and How to Buy It**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 4-6, Washington, D.C. — **Data Communications: Effective Network Design**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 4-6, New York — **Word Processing: Guidelines for Planning, Design, and Implementation**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 4-6, Chicago — **Increasing EDP Usage and Benefits Through Organizational Communications**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 4-6, San Francisco — **On-Line Systems Audit Controls**, sponsored by the Institute for Professional Education. Contact: The Institute for Professional Education, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

Dec. 4-6, Washington, D.C. — **Applied Data Communications Systems**, sponsored by the Institute for Professional Education. Contact: The Institute for Professional Education, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

Dec. 4-6, Washington, D.C. — **The Data Base Course**, sponsored by Management Resources International. Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Dec. 4-5, Palm Beach, Fla. — **CCIA Quarterly Meeting**, sponsored by Computer and Communications Industry Association (CCIA). Contact: Stephanie Biddle, Communications Director, CCIA, Suite 512, 1500 Wilson Blvd., Arlington, Va. 22209.

Dec. 4-6, Washington, D.C. — **ACM '78**, sponsored by the Association for Computing Machinery (ACM). Contact: Richard Austing, Department of Computer Science, University of Maryland, College Park, Md. 20740.

Dec. 4-6, Hartford, Conn. — **Computer Controls Course**, sponsored by the Greater Hartford Chapter EDP Auditors Association. Contact: Richard Carlson, Data Processing Audit, Travelers Insurance Co., 1 Tower Square, Hartford, Conn. 06115.

Dec. 4-6, San Francisco — **Conference and Exhibition on Small Computing Systems**, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Department PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Dec. 5, New York — **How to Plan, Select and Manage Remote Computing Services**, sponsored by Evans Research Corp. Contact: Evans Research Corp., 1394 Palisade Ave., Fort Lee, N.J. 07024.

Dec. 5-7, London — **Compec '78**, sponsored by *Computer Weekly*, Data Processing and Systems International. Contact: Iliffe Promotions Ltd., Dorset House, Stamford St., London SE1 9LU, England.

Dec. 5-8, Wellesley, Mass. — **Leadership: Managing & Motivating EDP People**, sponsored by QED Information Sciences, Inc. Contact: Edpep Coordinator, QED Information Sciences, Inc., 141 Linden St., Wellesley, Mass. 02181.

Dec. 6-8, Philadelphia — **Data Base Management Systems: General Concepts and Planning Guidelines**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 6-8, Los Angeles — **Integration of Word Processing and EDP Systems**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 6-8, Chicago — **Computer Performance Measurement: Tools and Techniques for Increased System Productivity**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 6-8, New York — **Data Processing: An Introduction to Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 6-8, Washington, D.C. — **Distributed Systems: Are They Right For You?**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 7, New York — **Information Systems: New Perspectives for Management**, sponsored by Center for Information Systems Research, Sloan School of Management, MIT. Contact: MIT Alumni Center of New York, 50 E. 41st St., New York, N.Y. 10017.

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IIA's DP Audit Conference To Stress Optimal Methods

CHICAGO — The Systems Auditability and Control Conference will be held here Nov. 13-15.

According to the Institute of Internal Auditors (IIA), the show's sponsors, the conference will present "the most appropriate, effective and economical system and control techniques in use today."

The program features two tutorial sessions emphasizing DP audit techniques. The first is "Systems Auditability Practices for Auditors," to be conducted by Wayne P. Hauge and William B. Cornfield from Touche Ross & Co.

The second is "Control Practices for Data Processors," to be presented by computer audit consultant Frederick Palmer.

Several workshops and panel discussions will also be offered.

The registration fee is $295 for IIA members and $325 for nonmembers.

Additional information is available from the Conference Registrar, Institute of Internal Auditors, 249 Maitland Ave., Altamonte Springs, Fla. 32701.

Cost Estimating Seminar Topic

HOUSTON — The Technical Marketing Society of America (TMSA) will sponsor an intensive two-day seminar on software cost estimating here Nov. 8-9.

The seminar is designed for software and financial managers responsible for directing, planning and costing software development projects.

The $325 course fee includes a copy of a collection of software cost-estimating information authored by the course instructors as well as tuition and reference materials.

Course instructors will be Larry Putnam, president of Quantitative Software Management, Inc., and Ray Wolverton of TRW's Office of Software Research and Technology.

For more information contact TMSA Seminars, Dept. SCE, P.O. Box 91295, Los Angeles, Calif. 90009.

Course Covers Software Costs

SAN FRANCISCO — A five-day workshop in forecasting software development cost and schedules will be held here Nov. 13-17.

Sponsored by the Institute for Software Engineering (ISE), the workshop is recommended for management and technical personnel responsible for directing, planning and costing software development projects.

Emphasis will be on the application of a management technique for forecasting the effort and time necessary to complete complex software development projects.

The workshop instructor will be Larry Putnam, a consultant and president of Quantitative Software Management, Inc. of McLean, Va.

The course fee is $375 for ISE members and $625 for nonmembers. Additional information is available from the Institute for Software Engineering, P.O. Box 637, Palo Alto, Calif. 94302.

Interface West 'Three in One'

LOS ANGELES — Interface West, to be held at the Los Angeles Convention Center Nov. 14-16, is being billed as three conferences in one with programs on small business systems, microcomputer design and development and data communications.

More than 100 consultants, end users and educators will address 60 scheduled sessions at the conference. Twenty-three of the sessions will deal with hardware, software, services, administration and other aspects of small business utilization.

Nineteen of the sessions will investigate different procedures involved in the implementation and use of data communications with emphasis on distributed DP.

There will also be 17 sessions dedicated to the technical side of microcomputer design and development, including sessions on processors, memories, software and interfacing.

For the three days of the conference, the registration fee is $85 with a discount price of $50 for the third attendee (or more) registering at the same time from the same location and company.

For a single day, the fee is $50 with a discount price of $30, applying the same conditions stated above. For the exhibits alone, the fee is $10.

More information may be obtained from the Conference Registration Department, Interface West, 160 Speen St., Framingham, Mass. 01701.

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Mini/Micro Conference Opens This Week

HOUSTON — The nitty-gritty of minis and micros will be explored at this year's Mini/Micro Conference and Exposition Nov. 7-9 at the Astro Village Hotel here.

The conference will include 30 half-day sessions organized into seven themes. Scheduling has been arranged to avoid conflicts among sessions on the same theme.

More than 100 speakers will offer both formal papers and panel presentations to the estimated 6,000 to 8,000 attendees. Ten sessions will be held each day, with five concurrent morning and afternoon sessions.

In the areas of equipment, sessions will include "The New Generation of Fixed Disks," chaired by L.S. Bleininger of Microdata Corp. The session will review the alternatives available within the second generation of fixed disk drives.

Also dealing with equipment, "The New IBM-Compatible Minis — Markets and Applications" will present a forum for three industry leaders to discuss the recently introduced IBM 370-compatible minis, their architecture and where and how they will be used.

"How to Computerize a Small Business," chaired by Joe Glover of Electronic Data Systems, will address the major steps of such an endeavor. The session will deal with the elements of computer acquisition as well as analysis of examples of small business systems.

Another session for the mini/micro user will be "Keys to Success in Selecting and Installing a Minicomputer," led by John P. Gallagher, Data Systems Division of A.O. Smith Corp. The session will deal with the place of the mini in a business organization, implementation of the system, software selection and management and control responsibilities.

For Vendors

For vendors, there will be sessions such as "Business, Entrepreneurial and Investment Opportunities in Minis and Micros." Session chairman will be Stanley Klein, editor-in-chief of *Mini-Micro Systems* magazine.

Speakers in that session will address emerging hardware and software opportunities for systems and software houses, entrepreneurs, individuals and small established companies. The session will also deal with investment opportunities for those wanting to support such activities financially.

In the technological area, "The Growing Impact of the Microprocessor on Computer Graphics" will be chaired by Carl Machover of Machover Associates Corp. In this session, a $30,000 interactive drafting system, several stand-alone graphics desktop computers, a high-performance vector-refresh display system, a laser high-speed automatic digitizer and a plotter and digitizer each costing about $1,000 will be described.

"Future Hardware Technology in Small Computers" will be chaired by Edward J. Bride of the desktop computer division of Hewlett-Packard Co. In this session, manufacturers and consultants will predict some forthcoming innovations in minis, micros and desktop computers in the next five to eight years.

Regarding software, "Pascal on Micros and Minis" will present a discussion of several implementations of Pascal; "the most widely acclaimed programming language in software engineering circles," according to the session chairman, Winsor Brown of General Automation, Inc.

"Approaches to Computer Network Troubleshooting" will provide a forum for the major vendors of protocol analyzers to clarify the basic differences among these products. The session will be valuable because "a mistake in choosing the proper diagnostic instrumentation could be competitively unwise, if not financially disastrous," according to session chairman Donald K. Wilkin of Hewlett-Packard Co.

The wares of more than 75 vendors will be on display at the exposition every day from 10 a.m. to 6 p.m.

Fee for the entire three-day conference and exposition will be $75 at the door. For one day of the conference and exposition, the charge at the door is $30. On-site fee for the exposition only is $5.

For more information, contact Mini/-Micro Computer Conference, Suite 1, 5528 E. LePalma Ave., Anaheim, Calif. 92807. (714) 528-2400.

'Aside From That, How Did the Meeting Go?'

Where end users are concerned, a computer is only as good as its terminal. A terminal that's easy to use, adaptable to different needs, and backed by a responsive manufacturer can make any computer operation more productive.

Honeywell's terminals are all of these.

A full line of general purpose display and printer terminals are part of the Series 60 family of computer systems.

In addition, Honeywell's Incoterm subsidiary offers a full line of terminal products that are compatible with Honeywell and other mainframe systems.

And all these terminals are designed for a wide variety of applications. They're equally at home in a small business environment or a complex communications network.

Visual display terminals.

VIP Series display terminals range from low-cost, conversational models for data entry, retrieval, and time sharing, to the sophisticated VIP 7800 Series with extensive editing and line graphic capabilities.

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Editorial

Phase II and DP Industry

In certain respects, the DP industry should not fare badly as a result of President Carter's Phase II economic guidelines.

It will be relatively easy for vendors to comply with the price restraints set by the Administration. The DP industry has seen hardware costs drop over the last several years, and this trend is expected to continue. Although this drop has been offset by increases in software, systems support and maintenance costs, major DP vendors have vowed they will meet the guidelines.

The 7% ceiling on annual wage increases may be more difficult to enforce, however, since this is a high skill industry and good programmers, systems analysts, teleprocessing specialists and so forth are very precious commodities that usually go to the highest bidders.

While it would be un-American at this point to suggest that the wage guideline should not be applied to DP workers, imposition of the limits might have some disconcerting effects. Industrywide salary levels rose more than 12% during the 12-month period ending in mid-1978.

The application of Phase II guidelines could well blunt the economic growth of this industry and, as a result, cut back DPers' positive effect on the economy as a whole. Even though DP firms want to stop inflation, such a cutback would be undesirable.

However, it would be premature to predict that a limit on wage hikes will adversely affect the growth and vitality of the DP industry.

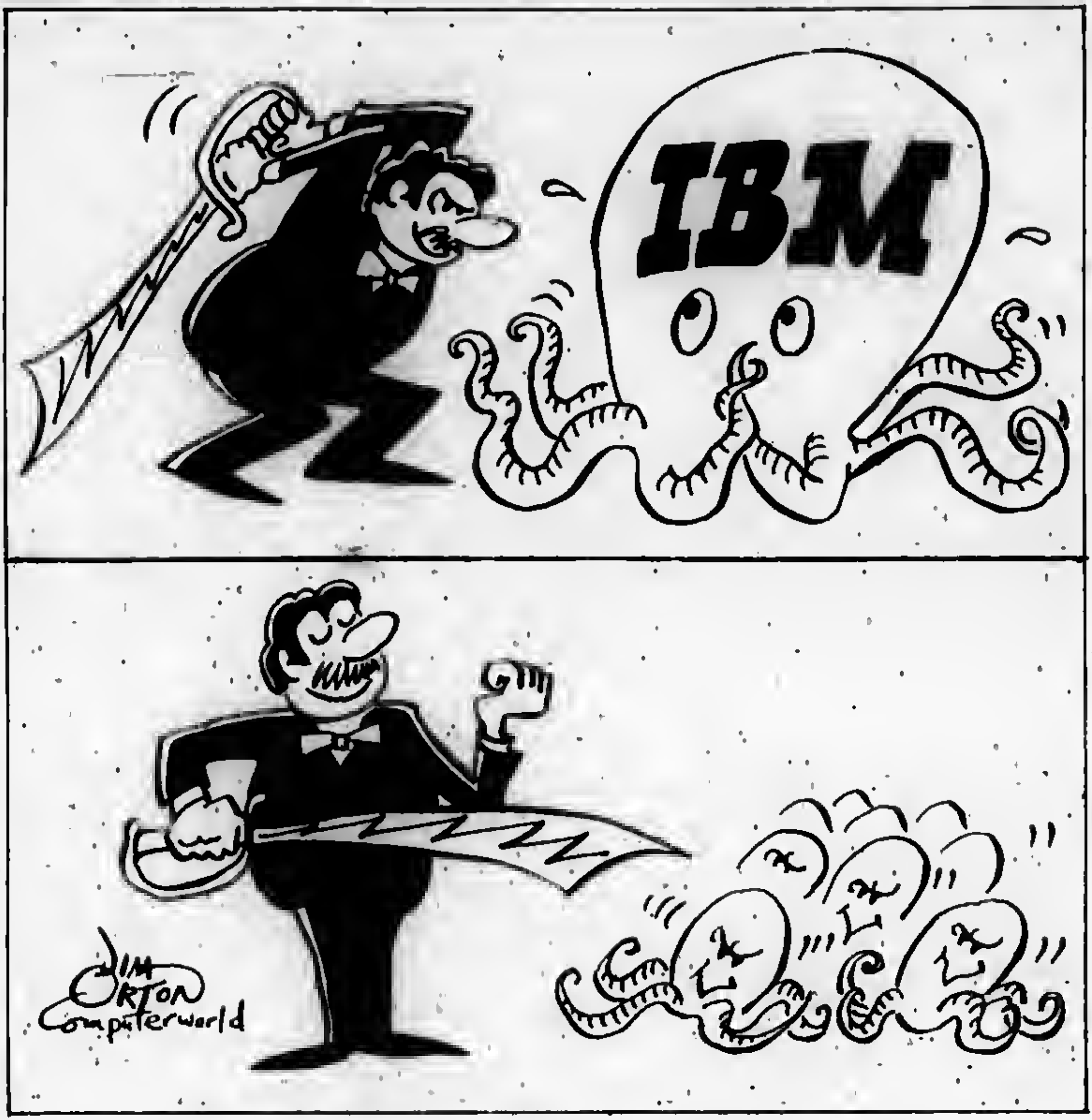
The DP balance of trade surplus has been a shining exception in an otherwise dismal deficit situation. DP systems are a very exportable commodity, and this outflow, even though small compared with some other segments of the economy (such as oil imports), has helped keep the overall trade deficit from being even worse than it is.

Another factor is less clearly understood, even by industry experts. But it appears that DP firms may be less susceptible to recessionary trends than others. To be sure, the recession of 1970 meant economic hardships for emerging DP companies, but a maturing, more sophisticated environment has meant DPers have suffered less in the more recent economic downturns.

This vitality has obviously been spurred by the need for DP products and the ability of small entrepreneurs to gamble with technological innovations. Even with a relative scarcity of venture capital in the past few years, an impressive number of new products have been introduced.

In short, the industry has been a powerful constructive force in an economy plagued by increasing inflation.

Nobody would suggest that the DP industry should be immune from Phase II guidelines. But at the same time, the positive aspects of this industry would seem to favor perpetuating the climate of economic growth that computer firms have enjoyed recently.



Letters to the Editor

'Circular' Solution

How odd!

Ken Lord [CW, Oct. 23] told us he wants banks to function much like public utilities, then proceeded to tell us that he got his knickers ripped by a bunch of banks acting much like public utilities. After all, when was the last time you got treated as an individual with sympathy and understanding by a telephone company, gas company or government agency?

His solution was equally circular. Precisely what is not needed is another stupid law telling someone else how to do business.

Remember, we might be next!

Oops, I forgot. He's the one with the vested interest in one of those certification programs who wants to pass a law requiring DPers to be certified. Now I see.

Sir, of the right and left doors leading to totalitarianism, you have once again taken the door on the right.

The solution to the problem of arrogance on the part of bankers is to pass a law doing away with all the laws that prevent real competition (as opposed to government sanitized) in the banking business. These are the laws that require all banks to be the same public utility-type operations, overburdened with government regulation and unwilling to treat you with much respect because you haven't got any place to go that's allowed to be significantly different.

David O. Blanchard
Santa Clara, Calif.

APL Article Incomplete

As an avid proponent of APL, I am always glad to see *Computerworld* publish APL articles. There should be more.

The recent In Depth article "Why APL?" by R.E. Cook and A.J. Rose [CW, Oct. 23] was a fine presentation of the directness and simplicity of APL's ability to solve business problems.

However, the discussion of Scientific Time Sharing Corp.'s (STSC) file system was not a presentation of the general nature of the commercially available file systems. The detail discussed regarding STSC's file system clearly detracted from the earlier fine presentation of APL's simplicity.

In fact, other available file systems can be simpler to use than the one demonstrated. For example: CompuServe's enhanced version of Digital Equipment Corp. APLSF, or enhanced IBM APLSV offered by TimeSharing Resources and APL Services.

It would have been appropriate to discuss the general aspects of the APL file systems further.

Generally, the available file systems are component number-based. The component number is simply a reference for each record on file. The programmer can determine the appropriate component number in a variety of ways, including the position of a key in a table or by calculation.

This component number has no bearing on the physical location of the record on disk. As with the rest of the APL language, the APL file systems eliminate the programmers' need for the traditional concern regarding the record size, shape and data type.

A key reason APL has done so well in the business environment is that with only marginal additional coding and execution time it is easy to implement required specific features in a generalized fashion. This attribute makes APL an attractive development tool in an ever-changing environment.

Charles W. Terry
Manager, APL Products
CompuServe
Columbus, Ohio

Data Past

Five Years Ago
Nov. 7, 1973

WASHINGTON, D.C. — At hearings on proposed amendments to the Fair Credit Reporting Act, senators were told that Americans "should have an absolute right to know what secret intelligence information about them lurks in the electronically controlled data banks of the Medical Information Bureau [MIB]." John E. Gregg of the Policyholders Protective Association told the Senate committee. "Every American who has a health insurance policy or has contemplated the purchase of one should have a right to know if he is among those under electronic surveillance" by the MIB.

— — —

FORT WAYNE, Md. — Cynthia Crooks, who was found guilty of attempting to sell a service bureau's programs to a client of the service bureau, was sentenced to a one-year prison term, but the sentence was suspended. Police had charged that Crooks obtained copies of a service bureau's programs for a brokerage firm from her boyfriend, who worked as a computer operator for the service bureau.

Eight Years Ago
Nov. 11, 1970

EL SEGUNDO, Calif. — XDS announced the Sigma 9, designed for on-line commercial and scientific applications. The Sigma 9 continued the trend toward commercial user appeal the firm initiated in the Sigma 6.

— — —

NEW YORK — During scheduled running hours, the average corporate computer spends about 30% of its time on reruns and maintenance and in idle mode. Well-managed centers, howevor, spend only 19% of their time on these nonproductive activities. This was one of the conclusions reached by a study of the efficiency of 89 corporate DP centers using 155 computers conducted by A.T. Kearney & Co., management consultants.

The Human Connection

IBM, AT&T Nearing Home DP Face-Off?

By Jack Stone
Special to CW

From the *Washington Post* article "IBM Seen Ready to Enter Home Computer Field" [Oct. 11]:

"IBM . . . is currently prototyping a low-cost personal computer suitable for the consumer market, say informed industry sources . . .

"There is a consensus that if IBM will introduce a personal computer, it will do so within the next 24 to 36 months . . .

"IBM faces potentially stiff opposition in the personal computer market . . . However, IBM's major concern is with AT&T and many industry people feel that the home computer will turn into yet another battleground for the two corporate behemoths . . .

"By virtue of the phone network . . . AT&T has an inherent advantage over IBM in establishing a personal computer market. Technology available to the phone company would allow it to modify phone terminals into microprocessor-based personal computers . . .

"IBM is thought to be building a keyboard with a microprocessor . . . that can be hooked up to a television set . . . Videodisks would offer a memory storage facility. . . . "

———

The time: A quiet evening sometime between 24 and 36 months from now.

The scene: The serene living room of Martha and Morris Diamond. Morris is reading about the latest happenings on Wall Street, when the front door bell rings and in walks Howard Adams, their IBM neighbor.

"Howie, I don't recall seeing you so dressed up. Is that what they call a 'Madison Avenue' three-piece suit?"

Adams was, of course, ready with snappy comeback number 73. "Actually, I was trying it on for my daughter's wedding. I saw your lights were on so I thought I'd stop by and join you at the TV set."

He then executed attention grabber 128: he made sure that the mainframe fell out of his coat pocket and bounced along the floor as he walked across the room.

"Hey, you dropped your cigarette case!" Morris cautioned.

"Oh, no, that's not for cigarettes," Howard replied as he retrieved the machine. "It's just my personal computer."

"Wow! What can you do with it?"

"Oh, study trends and statistics of the stock market, for example. Of course, my personal data base" — he flashed a three-inch disk in front of Morris's eyes — "is limited to stocks on the major exchanges for the past 25 years. But if I need more history, I can dial up a machine that can give it to me. It's our new Nice, short for National Interconnecting Computer Environment. Say, come to think of it, you follow the markets, don't you?"

"Do I ever! How do I get one of those?"

"No problem. I'll get one of our system engineers over to do a study of your DP needs, build you a five-year plan and show you how your needs can be satisfied for a DP budget increase of only 15% per year. Meanwhile, let's turn on the TV and I'll give you a demo."

Scene II

The next morning, Martha was busy cleaning the foyer when the doorbell rang.

"Why, Gary Nunn, what brings you around these parts? And how come you're wearing that fancy plaid shirt? And those new blue jeans?"

"Howdy, Mrs. Diamond! Just want to make a routine check of the lines. Our central office folks told me to see if maybe some squirrels loosened up some wires."

Nunn pulled a small display/-keyboard device out of his pocket, attached it to the handset and turned up the volume control. A voice was heard to say, "Only when fresh-chopped walnuts are liberally added to your fudge brownie mix will . . . ".

"Gary, what was all that?"

He turned down the sound and said, "Oh, I was just checking the lines with one of our new offerings. We call it Nice, short for National Interconnecting Communications Environment. You just dial up one of many numbers and out comes all the information you need to know about the kitchen — menus, grocery lists, appliance maintenance information, just everything. One of our consultants can come out to explain what we can do for you."

That evening, the Diamond family held its first meeting on its requirements for DP/data communications support and how it was going to select a vendor.

Reader Commentary

Adapso, Afips D.C. Move May Cure Cash 'Problem'

By Joseph T. Rigo
Special to CW

Two of our leading DP associations are moving their headquarters to Washington. This is only natural. Where else would a group go when it wants to learn how to get rid of large amounts of money quickly?

The groups are the Association of Data Processing Service Organizations (Adapso) and the American Federation of Information Processing Societies (Afips).

Adapso's members are corporations, mainly computer service bureaus, software vendors and professional service consultants. Adapso's formal mission in Washington will be to argue for fewer and lower taxes for these companies.

Afips is a collection of professional societies, such as the Association for Computing Machinery (ACM) and the Data Processing Management Association (DPMA). As such, its members are individuals. Afips will press for bigger and better research grants for computer scientists.

Both groups currently have their headquarters in Montvale, N.J., a pleasant suburb about an hour's drive from New York. They are the main tenants in a small office building near a parkway exit.

Part of a Trend

Their move to Washington is part of a trend. All of the big associations are doing it. It helps them solve their biggest problem: getting rid of cash.

In earlier days, these groups centered in New York. Their role was primarily public relations, and New York was the communications center.

An association could take a writer or broadcaster to lunch. Within a short time, if the group was lucky, its message would be circulating throughout the country in the form of a magazine article or a television special.

Times changed. The associations moved to the suburbs. And they got efficient. They found it was easier to work directly with members of Congress than to try to influence public opinion.

Also they got very rich.

This last point made them appreciate their Washington operations even more. Washington can be very expensive.

This is especially important to a group like Afips, which has been one of the big winners. Afips sponsors the National Computer Conference (NCC) every year, and its profits are enormous.

Afips' Philanthropy?

Afips has to give away most of its income to its member societies, but those societies don't know what to do with it either. ACM, for example, is papering its walls with Certificates of Deposit worth a half-million dollars each.

Adapso is younger and has not yet.

(Continued on Page 22)

The Taylor Report

Model Letter Clarifies Audit, Managerial Roles

By Alan Taylor
Special to CW

At the moment, DP auditing represents one of the fastest growing areas of our profession. The New England chapter of the EDP Auditors' Association is not yet three years old but has more than 150 active members.

While I was attending its October meeting, the president, William Coady of MIT, was receiving new members who had just been told by management to set up "DP auditing"; they were wondering what a DP audit was.

A central issue in many discussions I have had with practicing DP auditors concerns their work role and how they can effectively communicate with management about their activities.

Even when auditors discover errors, their relationship with management tends to remain civil. In that case, the conflict is between the employee responsible for the error and management. But when the auditor finds out something and wants to put it into the audit report, there's the rub.

'Illustrative Letter'

Until about a decade ago, there was little the financial auditing profession could do about this problem. However, about 1970, a new concept became generally accepted. A written letter to be drawn up by management and the auditor clearly sets forth the purpose of the audit and who will be responsible for getting the accounts straight.

Earlier this year, the "Management Representation Letter" won formal approval from the American Institute of Certified Public Accountants. The "illustrative letter" published in an appendix to the association's consolidated "Statements on Auditing Procedures" provides a clear guide: all DP auditors should have it in their private files.

The letter begins with a definition of the auditor's task. "In connection with your [the auditor's] examination of the [identification of financial statements] of [name of client] as of [date] and for the period of examination [dates] for the purpose of expressing an option or whether [the consolidated financial statements] present fairly the financial position, results of operations and changes in financial position of [name of client] . . . "

I think you will agree the letter is precise, yet covers a wide area. It is an easy letter for management to draw up when it needs an audit on, for example, an inventory control system.

It takes no more than a few minutes to draft such a paragraph. For example: "In connection with your examination of the XYZ Payroll System of our corporation as of Jan. 1, 1978 as it has worked since its installation on June 7, 1977 for the purpose of expressing an opinion on whether the installation

(Continued on Page 22)

Model Letter Helps Clarify Auditors' Role

(Continued from Page 21)

manager's monthly reports present fairly the financial position, future progress and comparison with the original specifications approved by management a year ago last Michaelmas. . ."

Well, perhaps it wouldn't go quite like that, but you get the idea.

Next, the letter proceeds to the heart of the matter. Who or what is responsible for the accuracy of the accounts? Is it the auditor, the DP department or the user?

It is essential that this point be agreed upon by the parties before the DP auditor writes and signs his report. Otherwise the audit will rest on a weak foundation just when it needs every ounce of strength.

The second paragraph of the letter begins, "We [management] are responsibile for the fair presentation [of the balance sheets] . . . " — which clears up the responsibility issue nicely. A series of points that must be thoroughly evaluated by the auditor, *even when everything is obsolutely perfect* follows:

- Data made available to the auditor.
- Irregularities involving internal accounting personnel — and others — or letters from regulatory agencies.
- Future plans and intentions that could change values.
- Financial institutions, "related part transactions" and other special arrangements.
- Contingent losses or gains and related possible law and regulation violations.
- Claims and probable claims known to the corporation's lawyers.
- Reduction of inventory value to realizable level.
- Title on all assets, lack of liens, encumberances and pledges.
- Losses resulting from contracts already in-house which cannot he completed at a profit.
- Adherence to contracts.
- Nothing changed since the period under examination.

And, most important, "There are no material transactions that have not been properly recorded in the accounting records underlying the financial statements."

Read that statement a few times. In effect, it is a blunt claim from management that everything necessary has been taken under proper consideration. Only management, never the auditor, can be sure about this. The integrity of the audit depends on this point.

Audit Task Clarified

DP auditors who make use of the illustrative letter in their work can expect the audit task to be clarified considerably. What is it that they are being asked to do? Should they redo the work of the project leaders or should they see if the project leaders' reports are complete and accurate? Should they see if the vendor contracts are being complied with?

And if they are misled by someone, and the accuracy of the audit report is questioned later, then who is responsible for the resultant inaccuracy? Would it be the person or the department who did the misleading or the auditor, who was taken in?

Hopefully this discussion has somewhat clarified the role of the DP auditor. Setting forth duties and responsibilities before the audit begins should ease the communication problem that often develops between DP auditors and management.

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Associations' Move May Help Solve Cash Trouble

(Continued from Page 21)

found a comparable money tree. Still, it manages to do quite nicely with its two or three smaller conferences each year.

The rise of wealth has not heen good for the people who work for these associations. They are trained in public relations. They are at their best when they are entertaining people and spreading the association's message.

Instead, they sit in their Montvale offices, stuffing money into the closets and watching cars go by on the parkway.

The trouble is that Montvale lacks proper facilities for hig spenders. There is no way you can spend more than $15 a person for lunch at the Ramada Inn across the street, and the wine list there is atrocious.

Afips and Adapso could move back to New York. But there is no point in taking a writer to lunch in an age when people have given up reading. And no one even dares to suggest a meeting to discuss computers with Walter Cronkite.

So Washington is the place. The town is swarming with Congressional assistants who are constantly hungry. You can take any of them to lunch, and no one will ever question the expense account.

You have to admire them in a way. Congressmen may not be the hrightest people around, but they keep in touch with their local papers. They see computer company stocks going up, and they see those recruiting ads offering system programmers $35,000 a year.

Afips and Adapso are setting out to convince these guys that we are a bunch of poverty cases, and the industry will collapse unless we get better government subsidies.

They will have a tough job. Fortunately, it will be very expensive.

Rigo is president of Sysdoc, Inc. in New York.

Letters to the Editor

Martin Books Available

Readers might like to know that Jim Martin's book, *A Speciol Report on Computer Networks* ond *Distributed Processing* [CW, Sept. 25], and his most recent two hardcover books, *Communicotions Sotellite Systems* and *The Wired Society*, are available from the Telecom Library at 205 W. 19th St., New York, N.Y. 10011.

Harry Newton
Publisher

Telecom Library
New York, N.Y.

Gets Everyone Involved

Prototype Seen Easing Use of DBMS

By **Don Leavitt**
CW Staff

MUNICH, W. Germany — Many installations begin to work with data base management systems (DBMS) by using the technology with one particular application, but that may not be the best way to do the job, according to two researchers who recently outlined a different approach.

Frank F. Kowalkowski of A. T. Kearney, Inc. and Ellen C. Rundquist told the Sixth International Adabas Users Conference, held here in mid-September, about a company that used a prototype approach to introducing the potential of Adabas, the DBMS from Software AG.

This approach exposed company personnel at all levels — from top management to DP technicians and data entry clerks — to the system, including give-and-take discussions of the way the prototype was developed and how it worked, the researchers said.

The company involved in the case study was "a member of the services industry" that was getting away from a batch-oriented "IBM 360 generation" environment. The prototype was envisioned as a means of cycling through, on a small scale, the entire DBMS procedure for developing an on-line system.

Offering facilities to people throughout the organization, rather than the limited audience that might utilize a specific application, the prototype operation involved defining a limited data base, the relationships between the elements, how it can be used and how well the system performs.

In particular, Kowalkowski and Rundquist noted, the approach provided management with proof of the concept's credibility, confirmed the choice of Adabas as the DBMS and showed users and project staff how to work with the on-line facilities.

But it also allowed the implementors to accumulate performance data on such things as run-times and the scale of programming effort required.

In addition, it gave management the opportunity to try specific terminals and see for itself what applications would be most appropriate for the production implementation.

Initially the project was oriented toward technical performances with high-volume, in-depth testing but was reshaped, after management review, to place emphasis on testing in breadth to evaluate the data base concept and its adaptability to the business environment of this particular company.

Project business analysts developed six prototype scenarios or mini-samples of the kind of work done by the user areas in the course of normal service operations. A list of data elements needed to perform the scenarios and to allow users to experiment with inquiries or to browse through the data base were compiled.

The proposed prototype data base was to consist of 200 elements and 10 files generated within four weeks of software AG training. In reality, the data base had 180 elements and 15 files and it took six weeks to complete, partly because of the

(Continued on Page 25)

VAX at Heart of Workbench

SANTA MONICA, Calif. — A system incorporating Digital Equipment Corp. VAX-11/780 hardware with Bell Laboratories' Programmers' Workbench (PWB) and Unix operating system software has been introduced by Interactive Systems Corp.

Designated the VAX Workbench, the turnkey system supports large-scale software development and documentation projects. But when not being used for that, the hardware can be used as any other VAX CPU, a spokesman said.

In addition to the software available in the basic Unix package, the VAX Workbench can include a screen-oriented text editor, compilers, comprehensive text editing facilities and a source code control system. An integrated electronic mail system further eases development by supporting interoffice communications, the spokesman noted.

Basic Hardware

Basic hardware for the workbench includes a 256K-byte VAX-11/780 with a 67M-byte disk drive, a tape drive and an 8-line multiplexer for use with Interactive's Intext, an intelligent 9,600 bit/sec video terminal specifically designed for text editing.

Software includes DEC's VAX/VMS virtual memory operating system, which is said to give multiple users direct addressing to 4G bytes of memory. DEC's standard Fortran IV Plus, VAX-11 Macro, Basic-Plus-2 and PDP-11 Cobol are also available as no-cost options.

The VAX Workbench software package integrates the tools of Unix and PWB/Unix into the VAX/VMS environment. These tools include the Unix Shell command-language interpreter; "C," a block-structured programming language; and YACC — Yet Another Compiler-Compiler — a general-purpose language specification tool.

The turnkey operation can support as many as 48 programmers concurrently and users can both create and document large programs for execution on large-scale target machines accessed through remote job entry facilities, the spokesman asserted.

The hardware in the Interactive package typically costs about $250,000, while the software starts at $75,000 for a basic Unix subsystem and climbs to $90,000 for a typical installation, he added from 1526 Cloverdale Blvd., Santa Monica, Calif. 90404.

DG Enhances Software on Eclipse

WESTBORO, Mass. — Data General Corp. has enhanced the software capabilities of the Eclipse data system family.

An automatic segmentation facility for the firm's Cobol permits the operation of extremely large programs, while enhancements to Infos file management software broadens its use to applications written in the PL/I, Fortran 5 and DG/L languages, a spokesman said.

Running under DG's Advanced Operating System (AOS), the Cobol compiler complies with the Ansi 1974 standard, with all implemented modules at the highest level. The segmentation facility allows the execution of very large programs, whose memory requirements exceed the normal memory addressing capacity of Eclipse systems, the spokesman explained.

AOS Infos is a data base-oriented file management system that provides multiple-keyed access to information in a multiple terminal, batch or communications environment. The current extensions permit access to these data bases for applications written in PL/I, Fortran 5 and DG/L.

"With these facilities, our users may choose from an extremely broad range of high-level languages, to select the one that best matches each application's requirement," the spokesman continued.

Support for access to the data bases through Cobol, RPG-II, Assembler and DG's Interactive Data Entry Access System (Ideas) was already in place and continues in addition to the support being introduced at this time, he explained.

AOS PL/I is based on the Ansi 1976 PL/I standard.

AOS Fortran 5 produces highly optimized code for fast runtime execution. Unlike many other compilers, which optimize only within single statements, Fortran 5's compiler optimizes globally across the entire program as well as locally within statements, DG said.

DG/L is an Algol-derivative structured programming language designed for a wide range of applications. DG/L is an ideal development tool for systems-level software such as compilers, assemblers, sort/merge and other utilities, the company claimed.

AOS Cobol carries a one-time fee of $4,000, while AOS Infos costs $2,000, DG said from its headquarters on Rt. 9, Westboro, Mass. 01581.

'UCC-42' Models IMS Data Bases

DALLAS — The UCC-42 data base modeling system package, now available from University Computing Co. (UCC), was designed to operate as a utility under all versions of IBM's IMS/VS data base management system, according to a spokesman.

The package is a facility to provide applications and data base administration personnel with practical answers to theoretical questions about the design of their IMS data bases, he said.

Because it functions without modifications to existing systems; UCC-42 provides a capability by which users can investigate alternatives that might otherwise be ignored, the spokesman asserted. It can be used to design a new structure or to ascertain the impact on other applications if a structure has to be changed, he said.

The utility runs in batch mode, extracting data from production data bases according to user-specified criteria and inserting the data in a predefined model.

Thus, UCC-42 allows for the restructuring of data bases, the manipulation of segment types within a structure, the breakdown of large structures into smaller ones and the modification of segment lengths, he said. The package can handle physical and logical data bases, he added.

Initial users have commented on UCC-42's ease of use and the "dramatic" reduction in manual effort required to create and maintain accurate model data bases, according to the spokesman.

Written in Assembler, the package reportedly requires no changes in the user's software. It takes 10K bytes of memory plus the space needed for DL/1 and buffers, and it costs $4,200.

UCC is at 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

For Networks, Queries

'Expand,' 'Enform' Enhance Tandem Facilities

CUPERTINO, Calif. — Tandem Computers, Inc. has added software and networking capabilities to its multiple-processor systems to allow users to link as many as 255 "geographically dispersed systems."

The added capabilities, called Expand and Enform, allow sites with Tandem CPUs and data bases to be linked together into four-wire private-line or X.25 packet facilities. Traffic on these nets is handled with the aid of data base directory information that is stored at each system site in the network, the company said.

Expand allows inquiries to be routed automatically to data that resides at remote sites using the best path available, but this capability relies on previously programmed data in the system which defines the location of application programs, a Tandem spokesman noted.

Other Features

As part of the Expand capability, the Network Control Process feature allows network links to be reconfigured in the event of malfunctions in specific network connections.

Computing resources and data bases in an Expand network are said to be location transparent to operators and programmers. In addition, a program resident in any system in a Tandem network can access data resident in any other system. But these features depend on directory data available at each multiple-processor system site.

Tandem also introduced its Enform software, which allows retrieval of data from multiple files in ways not anti-

(Continued on Page 30)

'Tiger' Enhances ICL 1500

E. BRUNSWICK, N.J. — ICL, Inc. has introduced an entire range of modular accounting application packages in support of broader use of the company's Series 1500 "Little Tiger" small business computers.

The systems were originally introduced early in the 1970s and despite the availability of Cobol, Basic and Business Transaction Language (BTL) support and communications software, have been used primarily as data entry systems, a spokesman explained.

With the introduction of Total Information Gathering and Execution Reporting (Tiger) software, more users should become aware of the systems' true processing capabilities, he said.

Tiger software currently includes modules for accounts receivable, accounts payable (including sales analysis), invoicing, general ledger, inventory control, order entry, client accounting and professional time accounting, the spokesman recounted.

The 1500 Little Tiger hardware — consisting of a CPU, keyboard, CRT, disk subsystem and printer — costs less than $20,000, and additional or remote data entry stations are available for $5,000 each, he noted.

The Tiger software is available at $1,000 per module, or all seven modules may be purchased as a package for $5,000, ICL said from Turnpike Plaza, 197 Highway 18, E. Brunswick, N.J. 08816.

XCS Program Controls Distributor Inventory

LOS ANGELES — A Planned Inventory Management (PIM) service now available on the remote computing network supported by Xerox Computer Services (XCS) should allow distributors to set customer service levels and meet them with minimal inventory investment, according to an XCS spokesman.

Described as especially useful to large distributors maintaining extensive inventories, PIM produces monthly reports including a forecast of demand for each item, a list of order points, economical order quantities and a tally of items below order points.

The system also simulates cost effects of possible inventory policy decisions before they are made, the spokesman said.

A requirements planning program is also included to provide aids for such things as cash flow projections and replenishment planning for product introductions or special promotions, he added.

PIM and other distributor-oriented services are available nationwide on the XCS network.

Costs are related to use of the networks resources, the company said from 701 S. Aviation Blvd., El Segundo, Calif. 90245.

NCR Cobol Validated

DAYTON, Ohio — The Cobol compiler supplied by NCR Corp. with the Virtual Resource Executive (VRX) operating system for the company's V-8400 and V-8500 systems has recently been exercised by the Federal Cobol Compiler Testing Service.

The validation disclosed only a "few discrepancies" in the "several thousand" features tested, indicating an "exceptionally high" degree of conformance with the Federal Information Processing Standard, according to NCR.

The validation program was developed several years ago in order to confirm that compilers being brought into the federal inventory did, in fact, comply with the American National Standards Institute specifications for the language — or to show where they failed to meet those "specs," an observer added.

NCR's Cobol compiler was built to the 1974 Ansi specifications and intended to operate under VRX, which the company said is capable of handling 35 programs at the same time.

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BCS Introduces Extensive Engineering Support

MORRISTOWN, N.J. — Apparently reaching back to its roots in the aerospace industry, Boeing Computer Services, Inc. (BCS) has introduced its Engineering Emphasis line of 24 engineering software packages along with staff support and the hardware capabilities of a multiple Control Data Corp. Cyber 175 configuration.

The software includes the first offering of Georgia Institute of Technology's improved version of the Integrated Civil Engineering System Structural Design language; a large-scale, three-dimensional, finite-element analysis program called Ansys; and a medium-sized finite element structural analysis program called E'SAP, a spokesman noted.

Other packages in the new library, all available on BCS' Mainstream — EKS remote-computing service, include a MacNeal-Schwendler Corp. version of the Nastran structural analysis program originally developed by the National Aeronautics and Space Administration, and Tpipe, a comprehensive piping stress analysis program also based on finite-element analysis.

The Engineering Emphasis products are complemented by interactive graphics capabilities that allow the engineer to review his model quickly and evaluate results for real-time decision purposes, the spokesman continued.

In addition to the five core products, the BCS engineering library includes 19 other programs currently used by structural, civil and mechanical engineers. For structural design and analysis, for example, there are packages that perform static, dynamic, buckling, heat transfer and nonlinear analyses, he said.

For general civil engineering, there are packages that perform hydraulics, hydrology, soils and surveying analyses. Graphics support products include interactive graphics, reports and graphs and the geometry of structural systems, the spokesman continued.

Although there is a surcharge for use of the products that are not BCS-developed, those costs are built into the charging algorithms, BCS said from 177 Madison Ave., Morristown, N.J. 07960.

Sample Aids DBMS Start

(Continued from Page 23)

shift in emphasis sought by management while the work was under way.

The project team was satisfied that all Adabas features that were tested performed as anticipated. The prototype was not an exhaustive test, but it was sufficient to confirm that the system would function as advertised, Kowalkowski and Rundquist said.

Response Time Variance

Response times varied greatly, they said, depending on the number of Adabas files needed to fill out a screen of data. The target was set at less than 10 seconds per screen and initial times were in fact as high as two minutes. But, the researchers noted, the prototype environment was good for tuning, without the pressures of a production system, and the times came down "nicely."

Some improvement was expected in programmer performance over conventional rates of 2,000 to 8,000 documented lines of code per year per person. In fact, approximately 7,500 lines were written during a three-month period by two programmers.

On the other hand, the researchers warned their audience, the development team realized that the success of the prototype did not by itself guarantee the success of a production system.

The possibility of converting the prototype to an elementary operational system "poses a clear and present danger" to the company. Among other things, special cases had not been accounted for; staff resources would be diverted from the target system to develop the extended prototype; ad hoc procedures, good enough for the prototype, tend to become institutionalized; and the system will eventually fall into disuse because it was not designed to be responsive to all the major applications that might be imposed on it.

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Now Growth Taxes Hardware

User Finds Way to Ease On-Line System Work

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BOISE, Idaho — Although the Idaho State Tax Commission is no stranger to DP, it entered the on-line world in April 1977, when work began for coding and making operational an IBM CICS-based income tax processing system by Dec. 31, 1977. This deadline was crucial because tax returns had to be processed starting Jan. 1.

The commission chose to use the State of Nebraska Income Tax Processing system as a model, and the DP group, headed by Richard Ford, set about adapting that system to Idaho's specific needs.

Programming on the system was started in mid-September 1977, but projections by both IBM and the Idaho Auditor's Office soon indicated that the projected deadline for on-line programming would be exceeded by at least 30%, which would effectively mean putting off the application for another year, according to Steven Sanderson, the analyst in charge of on-line work for the commission.

Contract programming was investigated around Oct. 1, with the hope that outside help might still allow the commission to make its deadline. In the meantime, the programmer's work week increased to 50 hours a week and more.

It was around this time that Sanderson became aware of User Files On-Line (UFO), a real-time CICS application development system from Oxford Software Corp. that Bob White and his systems programmers for the State Auditor's Office had been considering.

Since the 370/158 at the Auditor's Office was to serve as the processor for the income tax system, Sanderson agreed to take a harder look at UFO, which led to the decision to order the software and see if it could make the system fly by Jan 1.

Starting from ground zero in early December, Sanderson started to reprogram the entire system himself, using UFO. He had it up and in use by Jan. 15. Although the completed data collection and verification system was 15 days late and the operators had to hustle to catch up, Sanderson said he was "supersatisfied" with the results, especially since he had never heard of or used UFO before.

Companion System

With the basic bottleneck passed, Sanderson set about creating a companion system for on-line updating and inquiring against the 300,000-record income tax master file, which had previously been a batch process. Now better acquainted with UFO, Sanderson completed his task one month later, in mid-February, and turned the system over for immediate use.

Idaho has the seventh largest population growth rate in the U.S. today, and Sanderson said that growth has been reflected in a 25% annual increase in new tax records and name and address changes, making on-line inquiry and maintenance a necessity for servicing the citizens of Idaho on a timely basis.

Financial Benefits

More than 3,000 transactions a day are handled. Needless to say, the faster, more accurate processing has been financially beneficial to the state itself.

As of today, the on-line income tax processing is accomplished through 15 IBM 3277 CRTs located at the Tax Commission Offices in Boise, with an additional six CRTs in the various field offices.

Sanderson is an enthusiastic UFO advocate at this stage and has used the package to create application programs in other tax areas as well. He feels it has been a major factor in allowing the commission to meet its objective of getting on-line with as many applications as are needed and feasible. "I can get a simple inquiry up in one-half hour now and a full-blown display and update in a couple of days. With that kind of responsiveness, I can service the growing needs of the commission almost instantaneously."

Because of the success at the Tax Commission, the Department of Finance and the State Auditor's Office have also become enthusiastic users.

Not Without Cost

The increased use of CICS and UFO hasn't been without cost, however. The on-line growth has accelerated the saturation point on the 370/158 MVS to the point that a significant upgrade or a second machine of comparable size will probably have to be ordered a year ahead of schedule.

Currently, the machine configuration at the State Auditor's Office consists of two 3330 spindles, eight 3350 spindles, a 3850 mass storage device, a 3886 optical character recognition device, five tape drives (3420 models III and IV) and two 1403 printers.

In addition to its 370 operation, the Tax Commission operates an IBM 3600 financial system to manage the flow of cash collections on a daily basis. Because of the success of the 3600 data-collection operation, the Tax Commission is also considering off-loading much of the data entry from the 370 onto a mini system and using the 370 primarily for inquiry and update.

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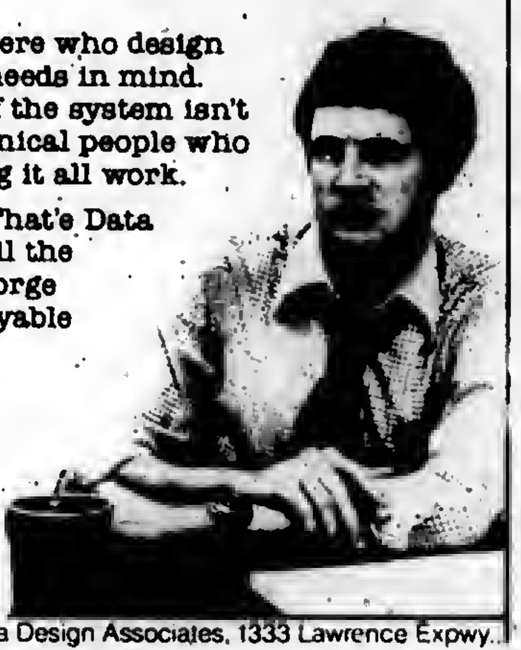

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BILLINGS

Data Base, Communications Lead ASI Courses

J. Daniel Couger
On
Education

Last week Advanced Systems, Inc (ASI) held its 10th anniversary professional training conference in Chicago.

A large number of videotape modules on a variety of new courses were displayed at the conference. The most important, according to Rohit Patel, vice-president of product development, is the advance information technology (AIT) curriculum.

Initial modules are available in each of the seven courses within this new "whole curriculum concept": database; data communications; distributed processing; networks; mini/micro hardware; on-line applications; and structured technology.

"Deriving Logical Data Relationships" was the module on display from the data base course, and "Design Factors Affecting On-Line Transaction Processing" was the module on display from the distributed processing course. Other new course modules displayed included NCP-VS concepts, structured analysis, Cics/VS, JES2 and JES3 dump improvements.

Other speakers (and topics) included Robert Wainwright (distributed processing), Gary Richetto (interpersonal relations), Ken Orr and Chris Gane (structured techniques), Dave Benenati (human resource management), Nate Newkirk (systems training) and Pat Coleman (transaction analysis).

Who Leads A/V Industry?

Thomas A. Duerden, president of ASI, and Patel visited me recently in Colorado Springs to "bring me up-to-date on the ASI situation." Duerden took exception to some figures in my recent column on sales and size of product lines of companies in the DP audiovisual (A/V) training field. In that column, I quoted Robert King, president of Deltak, saying his company would reach $20 million in sales this year and, therefore, would be Number One in the A/V industry.

"Last year we had sales of more than $13 million, and this year we will hit the $20 million mark," Duerden said. Because ASI is a division of URS, sales data for its operations is not public. The Domestic Sales Division now totals 120 people located in 17 offices.

In the international marketing division, there are 30 ASI employees and an additional 18 distributors servicing clients' needs in 70 countries. The product development staff now numbers 42 people, consisting of course developers, producers, editors, graphic artists, studio technicians and word processing typists.

Duerden reported that "over the last 12 months, ASI has released 186 videotapes; 129 were internally produced by ASI, 57 were from acquired courses."

ASI is big in foreign language translation. "To date, we have 155 videotapes available in Spanish, 12 in Japanese, 222 in German and 33 in French." In addition to translating the videotapes in courses, all supportive material such as student guides and coordinator guides are translated.

According to Duerden and Patel, ASI has a number of "firsts" in the industry, which include the following:

- First to use video-assisted instruction (VAI).
- First to offer a multimedia course.
- First to use interactive video.
- First to combine VAI with

(Continued on Page 32)

'Baysys' Eases Library Chores

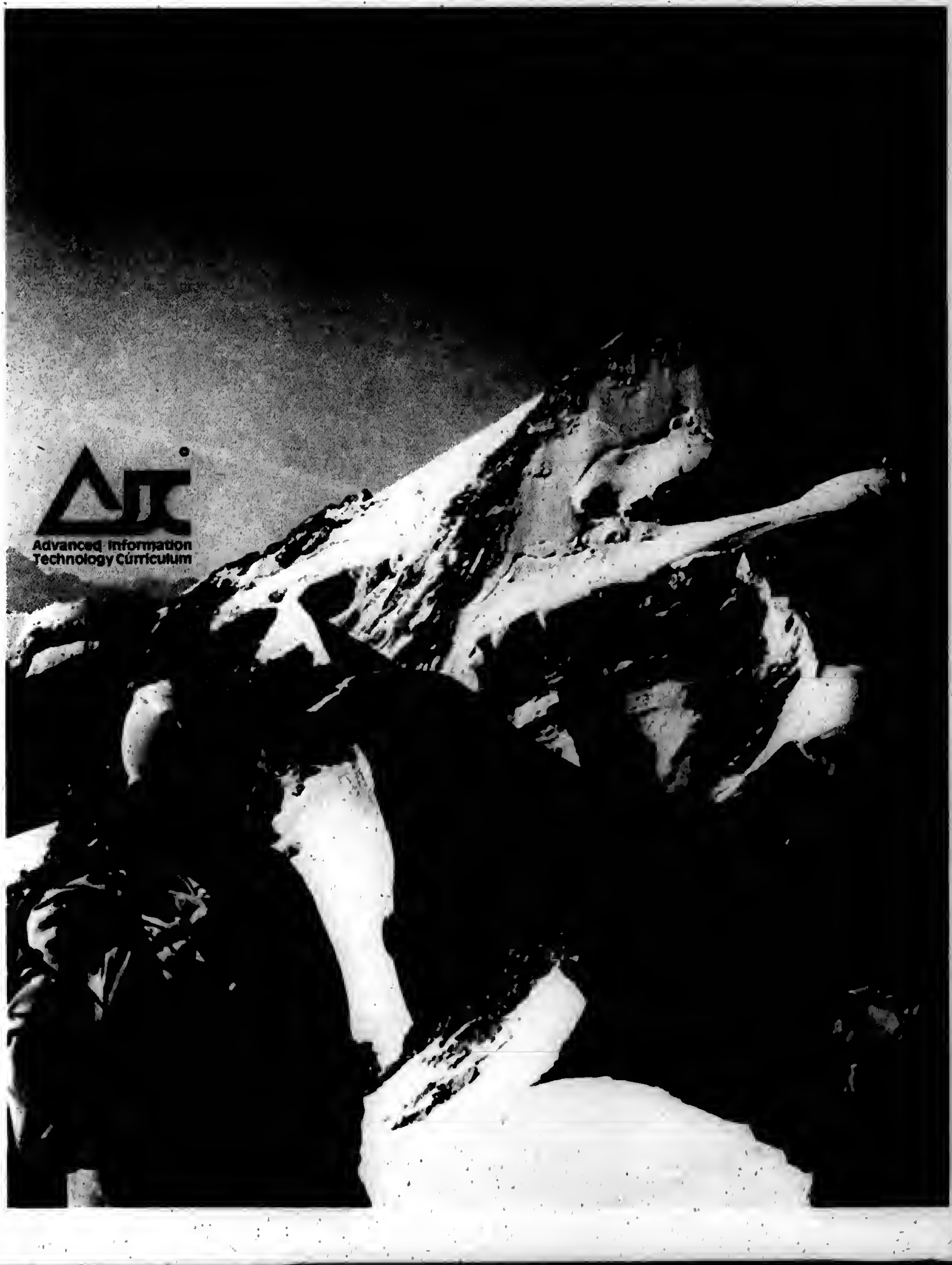
SAUSALITO, Calif. — An enhanced release of the Baysys software library and development system from Glosser Software Associates is said to make maintenance of programs and other card image data even easier for IBM DOS and DOS/VS.

The package automates the management of installation software," a spokesman said, explaining that with Baysys in place "many of the restrictions" of batch program library systems are eliminated.

Any type of instruction can be intermixed in the run stream and MOVE and COPY instructions facilitate program development, he noted. Multiple library support enables users to physically separate systems without loss of interaccessibility, he claimed.

Other important features, according to the spokesman, are a dynamic library space management facility that does not require partitioned data set-type compression; user password protection; multiple global character string replacement; and the maintenance of a history file to track what changes have been made over time.

The package costs $2,500, Glosser said from 625 Locust St., Sausalito, Calif. 94965.



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Ex-DP Professional Wonders

Tribulations of DBMS: Is It Really Worth It?

By Jake Kirchner
CW Washington Bureau

So you're a DP manager and folks upstairs get the idea that developing a comprehensive data base would be a great thing for the organization. Just thinking of all that good information a few short programs away is making them dizzy with anticipation.

Just hope it isn't Monday when you get the call.

Of course, they say, they'll do the coding and hire the extra keypunchers. Of course they'll cover all the expenses out of the executive budget. All they want, they say, is the use of a programmer now and then, and probably only after the data base is complete, and they only need an occasional, simple, straightforward run, whatever that means.

So of course you give in; what else can you do?

Well, what can you do — and what you had better do if you're to have any future in that shop — is to disabuse the folks upstairs of some of those fanciful notions about the simplicity of compiling and using that data base, let alone *updating* it.

Because, after all, that's the key. The really big headache is keeping the data base updated. Who is going to do it? Is there going to be a continual line in the budget for this task? (When you read "continual," think "forever," because a good data base is like a good marriage.)

The basic considerations in putting together your own data base are the same as in every other DP project. It has to be planned carefully, and it *must* have the backing of upper management. It does not matter whether the senior accounting staffers are eager to put together a computerized costing system if the comptroller has no interest in it, won't support it and won't let his staff spend time updating the darn thing.

Sure, it's flush now that there is a lot of big talk and even bigger money floating around, possibly including government grants if your organization qualifies for that kind of help. But what happens when that grant money runs out (it always does sooner or later, no matter what you've heard about government spending) or when the economy slows down?

The painful truth of the matter is that your fancy new data base might very well be the first thing to go. The reason is simple: The people who make the final budget decisions almost never understand data processing, let alone the importance of updating the data base for which they pushed.

They have a mental picture of a completed system. Once it's set up, they think, it will last forever. And when the budget is tight, their thinking on updating data bases is, "Why can't it go for another six months without really getting out of date? We'll get to it then."

So ask how important this thing is. How high up is it backed? How often will it be used? Is there a real commitment to this project, or is it just a whim of some middle management "genius" who thinks he knows "all about computers"?

Management clout — that's the thing. It's especially crucial when the data base is to encompass information from several or many or even every (talk about ambitious) department in your organization ("Think of the interface possibilities!" they say).

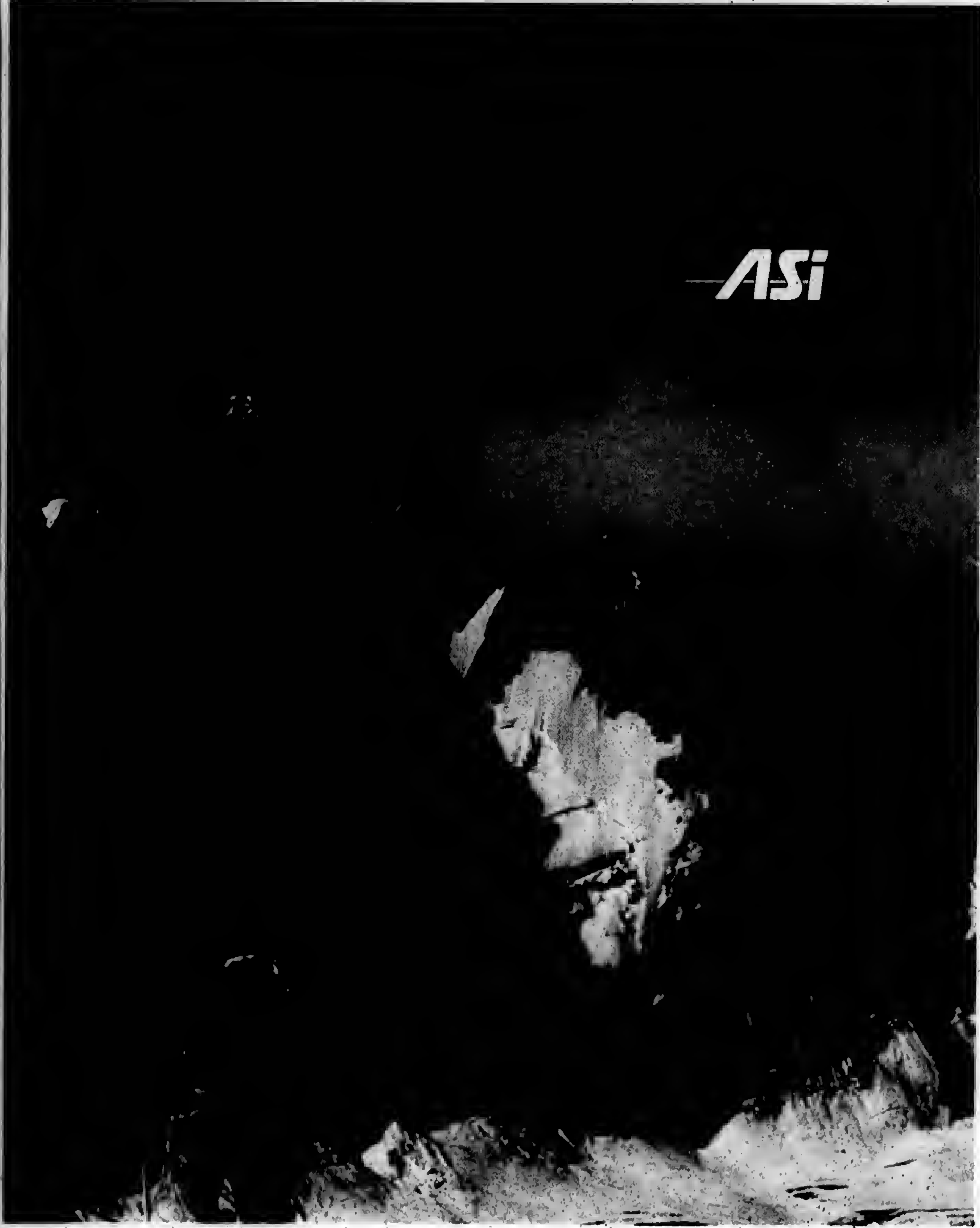
What will happen when one or more of those departments gets strapped for manpower, has its budget cut or gets a new manager who really doesn't like DP or DP people — or if the department already has a manager who hates DP or has no understanding of how the DP department works or how much work the project will take?

Then what? A lot of times a manager will go along with a multidepartmental project only because those above him want it, order it or request it nicely enough. Often it is just a matter of departmental comity.

But all that cooperation sure can break down in a hurry. And then what do you do? Send some of your DP people up to the recalcitrant department to beg to see their manual records so you can update the data base? Will they even let you in?

And what about the weekly routine — you know, that inventory report you're supposed to have out by Friday but the machine is down and the programmers are arguing among themselves about the football lottery and

(Continued on Page 32)



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Half of OS Shops Use Independent's Sort: IDC

WALTHAM, Mass. – Based on a study of 133 installations with 197 "IBM 360/370-type computers" running under OS or OS/VS, International Data Corp. (IDC) has determined that Syncsort from Whitlow Computer Systems, Inc. is used by 54% of the systems while sorts from IBM are used by 42% of the sample.

The researchers apparently felt confident enough of those percentages to apply them to the 3,400 OS or OS/VS systems installed in the U.S. and estimated that there were 1,836 users of Syncsort and 1,427 users of the IBM sorts as of July 1.

An additional part of the study, which was commissioned by Whitlow, analyzed the migration of users of sorting products between July 1, 1977 and July 1, 1978. According to IDC's report, "it was established that 96 out of 300 new OS and OS/VS systems became Syncsort users during the study period."

At the same time, it was also determined that 204 of the new OS or OS/VS systems entering the market during the study period were users of IBM's SM1-5740 sort package, IDC reported.

The statisticians also did some calculations to determine how many users of IBM's SM1-5734 or SM023 migrated to SM1-5740 in that year-long period. This number was derived "by subtracting the number of new computers using SM1-5740 (204) from the number of SM1-5740 users who converted to Syncsort (313) and adding the difference to the net increase of SM1-5740 users during the study period," according to IDC.

The fact that Release 3 of SM1-5740 could execute in OS/MFT, MVT and OS/VS enabled OS users to convert to SM1-5740 prior to converting their operating systems to OS/VS. This resulted in more than 50% of the combined SM1-5734 and SM023 systems converting to SM1-5740 during the study period, the researchers commented near the end of their report.

The results also showed that the majority of new Syncsort users were previous users of SM1-5740. Thus, the summary concluded, although both SM1-5740 and Syncsort acquired over 500 new users, the SM1-5740 base increased by only 232, due to 313 users switching to Syncsort IV-and-a-half after having used Release 3 of SM1-5740.

Packages Aid Tandem Users

(Continued from Page 24)

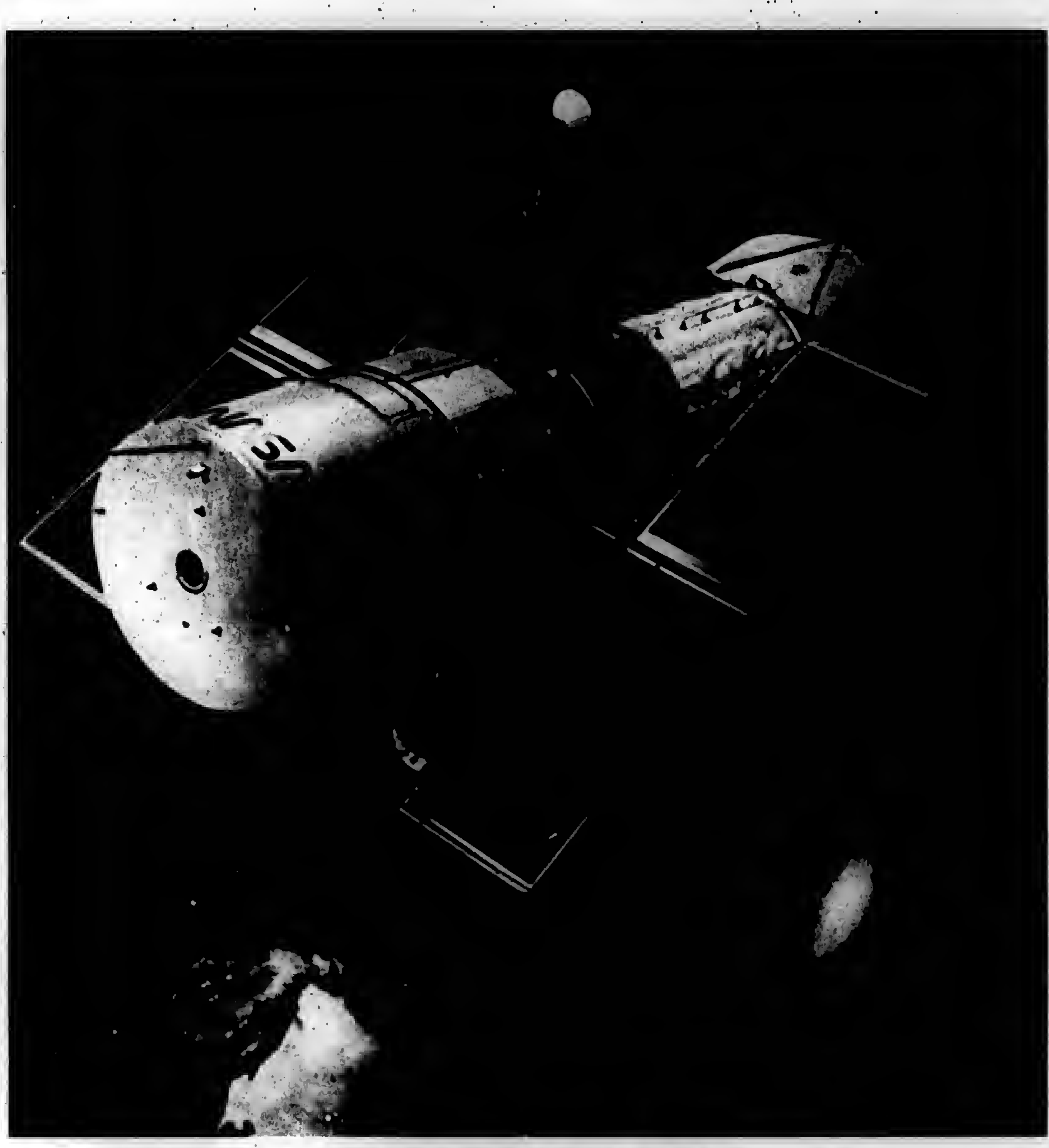
cipated during data base design, the company indicated.

Enform reportedly produces reports in less time than conventional languages such as Cobol, and its reporting options allow sorting and summarizing of retrieved data as well as evaluation of built-in or user-defined functions.

Described as a "nonprocedural language," Enform allows users to make queries with simple requests in English statements.

Expand will be released in March 1979 with a one-time license fee of $10,000 plus a microcode charge of $1,500 per processor in the network. Enform will be available at the same time and will cost $7,000 for the license fee and $1,500 for the microcode fee for each processor.

-Tandem Computers, Inc. is at 19333 Vallco Parkway, Cupertino, Calif. 95014.



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Lockheed's first Model 204 project involved the transfer of a system that controls large volumes of cost-estimating statistics. Model 204 not only handled the data, but also put it within easy reach of all types of people – from computer experts to clerks.

If you need a DBMS for your IBM 370/138 or larger computer, find out why thousands of users nationwide are satisfied with Model 204. Clip your business card to this ad and send to Computer Corporation of America, 575 Technology Square, Cambridge, MA 02139. 617-491-3670.

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TI 810 Printer 150 CPS	1,795	170
TI 820 Printer KSR	2,395	223
TI 733 ASR	2,995	278
TI 770/1 Int. Terminal	4,475	418
TI 770/2 Int. Terminal	5,485	510
Qume LTR Qual KSR	3,095	290
Qume LTR Qual RO	2,695	255
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Graphics Work Eased

IRVINE, Calif. — A cross-assembler written in Fortran IV is now available from Genisco Computers to lower the time and labor cost normally required to provide stand-alone, customized routines to Genisco's programmable graphics display systems.

The package should enable a much wider user base to work comfortably with the Genisco system, a spokesman said, noting that programming of the unit has until now been limited to those willing to work in the absolute machine language of the display systems' processor, which is unique.

Fortran IV is far more common and is available on almost all the host CPUs — mini or mainframe — from which the raster-scan-oriented display units get their input, he continued.

A manual describes in detail how users can work this langugae to drive the Genisco processor. The cross-assembler, in fact, can be used to create any of the 55 instructions the processor supports, he said.

The cross-assembler is provided in 9-track, 800 bit/in. magnetic tape format. Routines developed with it can be "autoloaded" from a host CPU to the programmable graphics processor.

The software and accompanying manuals are available for $1,000 from Genisco at 17805 Sky Park Drive, Irvine, Calif. 92714.

DBMS Installation Effort Can Leave Staff Unnerved

(Continued from Page 29)

the systems analyst is out sick or on vacation or on his honeymoon or on a three-day bender and Kelly Girls just laughs at you?

You think you've got problems? They're just beginning.

How do you explain to the other department heads that Joe in accounting won't cooperate? "What the hell does it matter?" you're asked. "That's not my problem," each one says or — even worse — "That's *your* problem."

And you start thinking that all you can do is go up to the executive suite and ask for a little push from above. Are they going to care?

Are you kidding?

And then you start to trace it back in your mind. Who started this whole thing anyway? Oh yes, that young kid with the big ideas who was right out of business school, the kid who left six months ago when the data base he dreamed up and pushed so hard for — he was the boss' golden boy then — was only half complete, and only he knew where the records were and what was going on.

So now it's Friday afternoon, and the inventory report has just left for the right manager, and the payroll is out, and believe it or not the machine is still up and every one is relaxed and looking forward to the weekend. And all you can think of is that damn data base and how you've "got to do something about it next week, no way around it."

Pretty soon, if not updated, it's going to be worthless and, as usual, you're going to get all the blame.

So you shuffle on down to the corner bar and grill and order your usual double with a milk chaser. You sit there for a few minutes munching peanuts, trying to unwind.

You notice, lying on the stool next to yours, a copy of today's newspaper, left by a previous customer. Gee, it's been so busy today that you haven't even seen the front page.

So you pick it up, but do you turn to the sports? Hell, no! Slowly you flip to "Positions Available" ads.

ASI Outlines Future Plans

(Continued from Page 28)

computer-assisted instruction.

- First to offer cost-free education support personnel to clients.
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The projected growth of both ASI and Deltak reveal a very healthy industry. Their projections are supported by data from the annual survey of Brandon Systems Institute, Inc. (BSI). Gary Slaughter, president of BSI, said DP training budgets are increasing by more than the cost of living in more than half of the organizations surveyed.

Couger is a professor of computer and management science at the University of Colorado.

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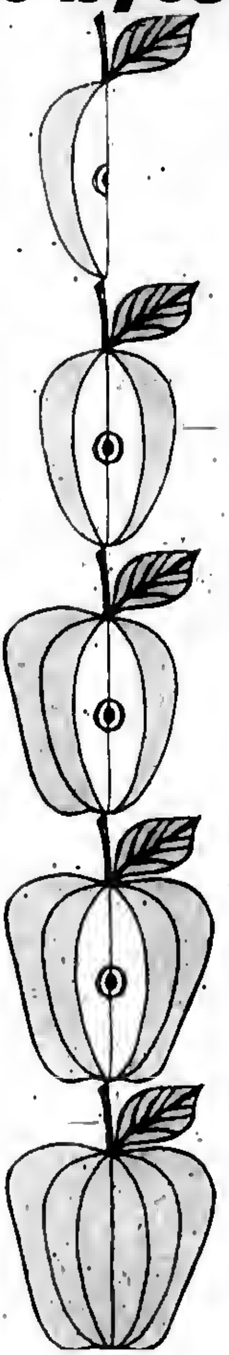

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And Reduce Newspaper's Costs

Terminals Give Reporters Flexibility

By Ronald A. Frank
CW Staff

DES MOINES, Iowa — Portable terminals have replaced typewriters at the *Des Moines Register and Tribune* as a more efficient way to file stories.

By using intelligent portable terminals and an in-house computer, the paper has reduced the costs and increased the efficiency of its newsgathering operations, managing editor Dick Kline said.

The paper originally purchased its Texas Instruments, Inc. Model 765 terminals for the Washington bureau. The writers might get back from an assignment late in the evening and the story might not be written until 2 a.m. "They used to have to worry about getting somebody to dictate the story. They would have to wait until the next morning. Now they can enter the story right from the terminal using any telephone," Kline said.

The Washington bureau had an Associated Press private line back to Des Moines which cost $165/week plus terminal equipment. This line was dropped and the paper put six 765s into the bureau instead. Now the phone bill runs about $97/mo from Washington to Des Moines, which is a big savings. The average cost of filing a story with the portable terminals is about $1.30, Kline said.

Because of the critical nature of the job, Kline said it is important to keep spare terminals available in case there are malfunctions. But generally speaking the terminals have not had unusual reliability problems and the TI service on them is good, he said.

Although originally the terminals were purchased for the Washington bureau, they have caught on fast with others on the editorial staff. Sports writers covering football games at distant cities can file their stories as soon as the games are over, he said.

Contention Problems

There have been some contention problems from stories being transmitted to the Univac 9400 CPU at the paper, but the problem results from having only one phone line into the mainframe. Kline is now looking at ways to get more incoming capacity.

Reporters enjoy using the 765s, since they are able to generate a hard copy for reference. Then, after editing the material, they can reansmit it via a standard telephone handset to the Univac 9400 CPU at the press

(Continued on Page 34)

Table-Top Terminal Printer Among Decwriter Additions

MAYNARD, Mass. — The Decwriter family of Digital Equipment Corp. terminal printers has gained a 180 char./sec model and the vendor's first table-top model, available in two entry-level versions.

The Decwriter line is now topped by Decwriter III, designed to upgrade digital networks in the 300- to 1,200 bit/sec range by increasing productivity and operating speed as well as reducing line charges. Decwriter III (also designated Model LA120) suits "applications requiring a high rate of data transfer, a high degree of interaction between computer system and user, or both," a DEC spokesman said.

Intended for time-sharing or stand-alone environments, Decwriter III offers microprocessor-controlled selection of more than 45 features via keyboard prompting or under program control, DEC stated.

The bidirectional printer has a 1K-char. buffer and logic that moves the print head to the nearest margin after completing a line and allows "quick skipping" over areas for which printing is not required, DEC continued.

Featuring an RS-232 interface, the pedestal-mounted Decwriter III handles rate selections in the 50- to 9,600 bit/sec range, but is called "primarily" intended for 1,200 bit/sec applications. Tractor paper feed, 7 by 7 dot matrix character representation, eight font sizes, six line spacing selections, self-diagnostics, a numeric keypad and both horizontal and vertical tabular settings are also provided.

In the compressed-font style, the Decwriter III can print across the entire width of a 14-7/8-in. computer form, yielding a 216-column output, DEC added, noting the unit draws 87- to 128 Vac. Options include a 4K-char. buffer capacity.

For Serial, Asynchronous Uses

Decwriter IV "can be used in virtually any application requiring a serial asynchronous Ascii terminal," the vendor declared. Available in LA34 and LA38 versions, the entry-level terminal printer employs a 9 by 7 dot matrix, both in upper and lower case, and al-

(Continued on Page 34)

Steamship Firm Looks to DDP For Tracking Shipment Status

Special to CW

LONG BEACH, Calif. — Sea-Land Service, Inc., a large containerized steamship company, relies on a terminal-based distributed DP (DDP) system to monitor the status of shipments bound for the firm's Long Beach docks.

This responsibility involves receipt of all charges due, original bills of lading, customs entry, customs clearance and other documentation that must be completed prior to release of cargo for final delivery, according to Judith Hultine, supervisor of Sea-Land's customer service department.

The firm uses a Sycor, Inc. Model 440 with four CRT terminals in the customer service department and one terminal and printer in the documentation department.

Each bill of lading contains a nine-digit identifier number; the first three digits represent the port of origin and the last six digits are a sequence number.

As the bills of lading are received, shipment information including bill of lading number, vessel, consignee, container number, weight, cube, bill rating and charges due, is entered via one of the four terminals and automatically stored for future use.

"Time is money," Sea-Land manager Vic Biringer explained. "Most of our tariffs allow a seven-day free time period for our customers to have their merchandise removed from our docks. Beyond the seven days, a demurrage or storage fee is imposed.

"In addition, a myriad of other time commitments on delivery translate into dollars for our customers," Biringer said. The total time cargo spends in transit costs money — in interest as well as in capital investment. Poor or inefficient mangement of shipping documentation could slow cargo flow.

Customers are thus constantly telephoning the customer service department for shipment status information. "We've conducted several telephone surveys," Hultine noted, "and have found that we receive 1,000 to 1,200 incoming telephone inquiries every week. This volume used to produce a major bottleneck in customer service."

Immediate Response

"However, with our system, we can immediately respond to customer calls," she continued. "By simply typing the bill of lading number into the keyboard of any of our terminals, we can retrieve a complete record of every aspect of the shipment and display it on the terminal screen in any one of three different formats.

"We can then respond to the customer in-

(Continued on Page 34)

DEC Adds Net Software For Decsystem-20 Family

MAYNARD, Mass. — Digital Equipment Corp. has expanded its network software to the Decsystem-20 family of systems. Decnet-20 is the latest release of Decnet Phase II products that enable users to interconnect all major DEC computers and operating systems.

Decnet-20 is based on Digital Network Architecture (DNA) protocols and runs under the Tops-20 operating system. It permits task-to-task (program-to-program) communications between a Decsystem-20 computer and any adjacent network node — another Decsystem-20, a VAX-11/780 system or PDP-11. Decnet messages sent and received by the user programs can be in any data format, DEC said.

Decnet-20 operates with Digital Data Communications Message Protocol (DDCMP), Network Services Protocol (NSP) and Data Access Protocol, which are modules within DNA.

Decnet-20 includes a Network Control Program that logs and displays statistics such as data on network message traffic and errors. It also controls local loopback test arrangements to aid in isolating communications problems, the vendor said.

On Decsystem-2020 systems, Decnet-20 is implemented as an ancillary process under Tops-20 and resides in the 2020 processor. Decnet-20 implementation on Decsystem-2040, 2050, and 2060 systems uses a separate communications front end, the DN20.

Decnet-20 software is available for a single-system license fee of $5,000, including installation and support.

The DN20 is a PDP-11/34 which costs $28,200 for use as the Decnet-20 front end.

Direct-Connect Modem Offered

SAN JOSE, Calif. — A full-duplex originate/answer modem for use in direct-connect mode rather than data access arrangement has been added to Anderson Jacobson, Inc.'s (AJ) family of 1,200 bit/sec data sets.

The Model 1255 modem is compatible with Vadic Corp. VA34XX modems and AJ's most recently announced acoustic coupler, the AJ 1234.

The product suits interactive timesharing, message network and distributed data processing applications. "With the elimination of line turns, characteristic of half-duplex operation, the AJ 1255 increases throughput fourfold, reduces connect time and maintains viable data integrity," the vendor stated.

Boosts Mobility

Registered with the Federal Communications Commission to work with the AJ11 permissive jack or the vendor's RJ41 or RJ45 data jacks, the unit enhances communications mobility and reliability, the vendor claimed.

A telephone is optionally available with the modem.

Without the telephone, the AJ 1255 costs $825, AJ said from 521 Charcot Ave., San Jose, Calif. 95131.

Decwriter Line Expands

(Continued from Page 33)

lows the user to select any of four character sizes.

Both Decwriter IV versions also offer a 210 char./line output capability via a compressed font style. The model's output rate of 30 char./sec is maintained through use of a buffer that stores characters being received by the terminal while it is executing a carriage return, DEC said, adding that a special "burst mode" causes the print head to accelerate its print rate until it has caught up with the transmission.

A special-purpose microprocessor permits the user to select type font, tabs and margins by using a "set-up" key, the vendor continued, adding that settings can also be made from the CPU connected to the terminal, through programmed commands.

The LA34 features platen paper feed but does not provide a numeric keypad, while the LA38 features both platen and tractor paper feed and does include a numeric keypad.

Both versions of the table-top Decwriter IV accommodate 110- and 300 bit/sec rates; provide a 128-char. buffer capacity, self-diagnostics and horizontal — but not vertical — tabular settings; weigh 25 lb and draw 87- to 128 Vac.

The Decwriter III costs $1,830 in quantities of 100 and first deliveries are scheduled for January, DEC said.

The Decwriter IV LA34 costs $1,450 in minimum quantities of 50 or $975 in 100-unit orders and will be shipped starting in February, the vendor noted, while the LA38 costs $1,700 with first deliveries planned for late spring.

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Steamship Firm Uses DDP For Control of Shipments

(Continued from Page 33)

quiry with an accurate and up-to-date status report. Callers may then be immediately informed whether we have all the necessary paperwork required for movement of the shipment and whether it is available for pickup," she said.

Prior to obtaining the 440 system, Sea-Land used a manual procedure, where all shipping information was logged by hand, from paperwork received to numerical log. "Only one person at a time could access this log because it was a single hardcopy document," Biringer recalled. "Large amounts of time were wasted by the employees responding to inquiries. Several people would be waiting for the log while another was either answering telephone inquiries, logging or trying to assist a trucker. It was quite inefficient," he said.

Clustered Distributed DP

Using the clustered distributed DP concept, the company can use all terminals as instantaneous and simultaneous data retrieval stations. Each person performs more efficiently and can spend more time on other aspects of customer service. Four different terminals in the customer service department provide information at the same time, with no delay to anyone.

"We find it's a lot easier to sit at a computer terminal, key in a number and have everything you need appear on the screen, than it is to be flipping through a log book searching for a particular number," Hultine observed. "And the system is easy to use. All that is required is the ability to depress typewriter keys or use a 10-key adding machine."

A fifth terminal is located in Sea-Land's documentation department, where it is used to input immediate transportation entry (IT) data and to produce IT reports. The IT is a manifest of the goods under U.S. Customs Service control and is used to transport cargo, in bond, from port of entry to an interior point where the cargo may be cleared through Customs by the ultimate receiver.

Input data describes carrier, consignee, consignee's address, foreign port, bill of lading number, date of sailing of vessel, name of vessel, arrival data at Long Beach, latest location of goods, carton markings, shipper, number of pieces, number of cartons, type of contents, weight, value and container number.

All of this information may be instantaneously retrieved and printed in the appropriate IT format at the touch of a button. The system also produces a manifest, listing some of the preceding information for all cargo that is interchanged with rail for movement to final inland destination.

All incoming shipment logs are printed by Sycor's 300 line/min Dataprinter in any of the desired Sea-Land customized formats. Included is a summary log or way bill report that is produced after all the transactions against a given vessel are complete.

The way bill report lists for each vessel a bill of lading number, vessel name, customer name, broker, broker's file number, total pieces in shipment, total weight, total cube and revenue tons, all in metric.

The report also describes how a bill is rated; i.e., on a container load basis or on a less-than-container load quantity. It also contains information on total revenue due against shipment, date of revenue payment, date of receipt of original bill of lading, Customs clearance, date of pickup and trucker.

Other reports made are a periodic log describing all cargo on hand and a delivery log reflecting all cargo that has been delivered.

Paper's Smart Terminals Give Savings, Flexibility

(Continued from Page 33)

site at 30 char./sec. And if message transmission is garbled because of interference over the phone, they can transmit, since the terminal will not purge its memory except on command.

To date, *Des Moines Register and Tribune* reporters have transmitted stories from hundreds of miles away from their news plant. They have covered tournaments at remote golf courses, as well as from a local police station. Still others have taken the terminals home at night to compose, edit and transmit their stories to the news plant via their home phone.

In essence, the paper has established a "mini wire service" which empties into the 9400 CPU. Reporters can hold two stories in the 765 bubble memory at the same time, and each or both of them can be inserted in the earliest possible news edition. Since the stories can be stacked in memory for cost-effective, high-speed batch transmission, dollars are saved by reducing communications costs.

Kline said the major features of the 765 are portability, the ability to capture the reporter's original keystroke and reliability.

Its ability to capture the original keystroke (eliminating retyping or repunching before the newspaper is composed) is attributed to is nonvolatile bubble memory.

The memory is compact, each 92K bit being about the size of a quarter, and able to store up to 20K characters (four or five pages of typewritten news stories) in memory.

The memory replaces magnetic tapes, paper tapes and other electromechanical memories that are less reliable and too cumbersome to carry into the field. And if power is shut off, the stories are retained in memory, to be transmitted over standard phone lines at 30 char./sec when rates are lowest.

Electrical "brownouts" or "blackouts" will in no way affect stories in memory.

The Model 765 portable memory terminal offers reporters the ability to record and edit. Wherever there is a phone, edited stories can be transmitted to the CPU at the home news plant.

Which CRT family
now includes a simple,
character-mode terminal with
bright, high-resolution display, two full
pages of continuously scrolling memory,
familiar typewriter-like keyboard with
embedded numeric keypad, comprehensive
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preprogrammed function keys,
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120 cps hard copy?

HP introduc

We took a long, hard look at how you use a simple CRT terminal. We applied 10 years of experience producing sophisticated, high-performance computer products, so the newest member of HP's terminal family is engineered from just one point of view: yours.

If you used a CRT all day, you'd demand the brightest, sharpest display made. So we didn't take any shortcuts on the 2621's display. It's the same display with enhanced 9X15 character cell you see on every HP CRT terminal, even our top-of-the-line models.

Interactive sessions go faster if you can look back at what you've already done. So we designed two full pages (48 80-character lines) of continuously scrolling memory into the 2621.

Recognize the 2621's keyboard? It's a lot like the familiar typewriter almost everyone's used to. Which makes the 2621 easier to learn, faster to use. And to accelerate keying in numbers, we put the numeric keypad right in the middle of the keyboard.

Then we increased the capability of the 2621's simple keyboard with eight special keys. In regular use, they control the cursor, rolling and scrolling. But they're also labelled on the screen with preprogrammed functions which, with a touch of the shift key, control self-testing, terminal configuration, display functions and editing.

Editing? On a simple CRT? Sure, because editing gets more work done faster. The 2621's comprehensive editing includes character and line insert and delete, clear line and clear display. What's more, the 2621 keeps your input separate from your CPU's so you can edit data before sending it to your CPU. And all without rewriting a line of your system's software.

And the 2621 is Bell 103A compatible and communicates with your CPU at 110 to 9600 baud through an RS232C interface. Which makes interfacing a snap.

That's the 2621A.

But we've gone a step further. How many times have you wanted just to hit a key and get hard copy of your CRT display without making a big project out of it? Now you can with the 2621P. Its built-in 120 cps thermal printer zips out a page of hard copy in seconds. With a single keystroke.

And here's more good news: the 2621A costs only $1450; the 2621P with built-in hard copy costs only $2550.

Surprised by all these features in a simple, inexpensive, character-mode CRT? We don't think simple has to mean unsophisticated. To prove it, we're turning HP's advanced technology and 40 years of manufacturing experience into products you need.

Like the 2621: the simple CRT you'd expect from Hewlett-Packard.

Try this on your favorite CRT: With the 2621P, you just hit a key and walk away in seconds with hard copy of your CRT display. The built-in thermal printer prints upper and lower case at up to 120 cps.

The 2621's bright, high-resolution CRT displays the full 128-character ASCII character set, including upper and lower case, control codes, and character-by-character underline, in 24 80-character lines.

Eight screen-labeled preprogrammed function keys magnify the power of the 2621's keyboard. Preprogrammed functions include editing, terminal configuration, printer control and self-test.

To make numeric data entry faster and easier, we put the 2621's numeric keypad right in the middle of the keyboard, instead of at one side.

The 2621's familiar 68-key keyboard is almost as easy to use as a typewriter.

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The Sprint 5 KSR terminal has a typewriter keyboard for communication, data entry, and programming, plus a numeric cluster for quick numeric entry. And the Sprint 5 RO functions with the same command set, received through communication lines.

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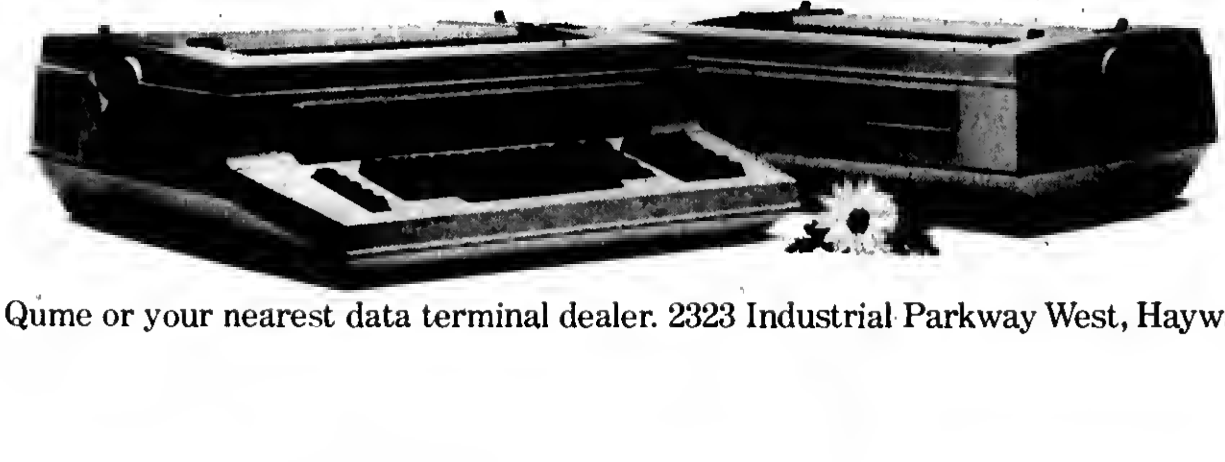

For details, contact Qume or your nearest data terminal dealer. 2323 Industrial Parkway West, Hayward, California 94545.

With Immediate Sales Updates

System Keeps Retail Chains' Accounts Current

VINELAND, N.J. — An on-line Automated Retail Merchandising System (Arms) that captures data as sales are recorded, transmits this data to a CPU and provides immediate updating of sales, inventory and other accounting data for retail chains has been developed here by Concept Systems, Inc. (CSI).

The CSI turnkey system interfaces with a number of point-of-sale (POS) terminals, including most NCR Corp. models. A number of these systems are in use at retail chains throughout the U.S. and Canada, and CSI has recently received an order from the U.S. Navy to install a pilot system near Chicago for Post Exchange applications.

One of CSI's "most satisfied customers" is Conston, Inc., with four chains and 70 stores in eight states, according to Charles Thomas, CSI vice-president for technical operations.

"Each night, an unattended Vadic Corp. auto dialer polls the 70 branches, collecting data on transactions, sales, returns, payroll — whatever is needed," Thomas said.

"Data is transmitted from the branch stores to the central CPU using 1,200 bit/sec Vadic [Model 202-type] auto answer modems. During the night, data is processed unattended, reports are generated and are ready when headquarters opens at 8 a.m. the next day. If there is a problem, a particular store can be repolled and errors corrected before the store opens at 10, " he continued.

Few Problems

With the Arms system, CSI has reported few problems. For example, during Christmas week, 120,000 transactions were polled on a single system with an error rate of 0.02% — compared with the typical error in a manual system of close to 3%, Thomas said.

"Three years ago we replaced Bell modems with Vadic units," Thomas recalled, "and have realized an 11-1/2-month payout by purchasing instead of renting. This means we have made money for the past two years simply by switching vendors. We've had virtually no downtime on the modems, plus we have far better line control because of the displays and diagnostics."

The only data communications problems have been during installation, and most of them resulted from the Bell Data Access Arrangements (DAA). From now on, CSI will use Vadic direct-connect modems and eliminate the Bell DAAs, according to Thomas.

Another thing that has impressed CSI has been Vadic's knowledge of the total network, Thomas said, adding that the vendor's people know far more than the average telephone company service man.

"Because of Vadic, data communications has been quite automatic, which is very important to us since we can't be bogged down reinventing the network each time we install a system," he said.

Proposal Preparation

Arms can automatically prepare proposals and quotations for prospective customers. A company profile is generated from basic information such as the type of store, number of locations and reports desired.

The system will then automatically prepare a detailed proposal, including software and hardware requirements and prices. The proposal includes system specifications, flow charts and a Gantt chart so the system can be bought piece by piece, Thomas explained.

Since Arms is modular, users can implement the program in stages. The major functions of the system include purchase order management, merchandise control and reporting, merchandise movement management, merchandise ticketing, accounts receivable and payable, general ledger and payroll and customer billing.

In addition, Arms provides for data base maintenance and other utility routines to keep files current and operative. Most of Arms applications are performed on-line, and the system was designed to provide accounting and management information instantly through CRTs and/or hard-copy printouts.

Systems hardware consists of a Microdata Corp. Reality CPU with up to 128 64K words of memory. Peripherals include tape drives, disk drives, CRT terminals (1,920-char. displays), high- and low-speed printers and optical character recognition A-type ticket printers.

Data communications equipment in-

(Continued on Page 40)

Fabri-Tek has an ace in the hole for PDP 11/70 users.

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Touch-Screen Digitizer Bows

BOHEMIA, N.Y. — Megadata Corp. has introduced a Touch Screen Digitizer that allows users to touch a display screen to access data.

When added to display systems, the device lets an untrained person gain direct access to a computer and its data bank, the company said.

The Touch Screen Digitizer is said to eliminate fixed-function keyboards and lightpens, permitting the operator to devote attention exclusively to the display.

The touch screen operation is accomplished by means of a Megadata process termed Echo Surface Wave Ratio (ESWR), which operates on the same principle as radar or sonar. The ESWR process uses two rows of piezoelectric transducers, one on the vertical edge of the display and one on the horizontal edge.

By pulsing these transducers with a signal, a wavefront in the X and Y directions is propagated across the surface of the faceplate. When a finger is pressed on the faceplate, a reflected wave is created by the disturbance of the wavefront. The reflected wave is propagated back to the transducers and detected at that point, the firm explained.

The Megadata Touch Screen Digitizer is available for 15 in. screens, with a 25° radius. The digitizer and its associated electronics cost $1,200 to $1,500 from Megadata Corp., 35 Orville Drive, Bohemia, N.Y. 11716.

CCMI Extends Services Of National Tariff Library

RAMSEY, N.J. — The Center for Communications Management, Inc. (CCMI) has introduced a "selective screening service" for its National Tariff Library.

Users interested in specific functional areas may subscribe on a selective basis, CCMI stated, noting however that "the generalist" may still obtain a full set of the tariffed rate and policy schedules on file with the regulatory agency.

The five functional areas are:

- Telephone switching systems (for example, PABX, Centrex).
- Key systems (for example, Comkey, Horizon).
- Data communications equipment and systems (for example, modems, multiplexers).
- Private-line services (for example, data, voice, Telpak).
- Local exchange detail (for example, message unit schedules, extended area plans).

Tariff excerpts covering these areas are available for the major Bell operating company in each of the 48 conterminous states and the District of Columbia at $50 per category/state, CCMI said, adding that updating is furnished on a weekly basis at 40 cents per page.

Inquiries should be sent to Tariff Coordinator c/o CCMI, P.O. Box 324, Ramsey, N.J. 07446.

Teleprocessing transactions arriving faster than you can process them?
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System Keeps Data Current

(Continued from Page 39)

cludes Vadic 1230D modems and 801C/D auto dialers. A typical Arms system for a retailer costs $150,000 or $4,000/mo under a five-year lease/-purchase agreement, including maintenance. A system for a chain of 55 stores might sell for $250,000 or $6,500/mo on a five-year lease/-purchase plan.

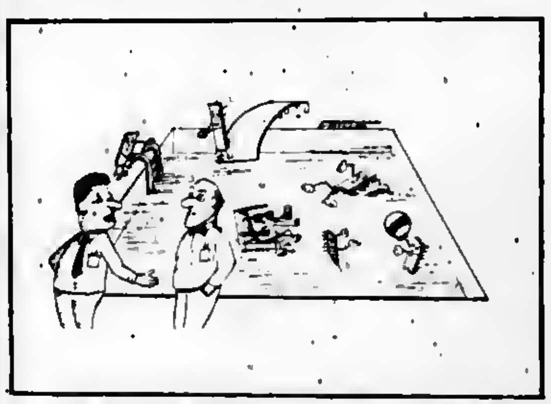
Further Benefits

The system allows graphic display of open-to-buy information on CRT terminals in the store, showing the status of open orders, cancellations and adjustments.

Another Arms benefit is that incoming goods can be automatically ticketed and extensive product information translated into codes for POS register use.

In addition, Arms handles all accounting functions — such as accounts receivable, general ledger, posting and financial statements.

Finally, the data communications network with Vadic modems and auto dialers allows individual retail stores to employ the central office CPU.



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Wordstream Gains Bell-Type Interface

NEW YORK — Wordstream Corp. has unwrapped a communications interface that allows two or more Wordstream word processing systems to transmit or receive information over conventional telephone lines.

Using a Bell System data set, the interface allows information to be transmitted or received without interrupting text entry, editing or printing operations, the vendor said.

To send data, the operator selects the communications mode from the system's program directory and enters a few commands, Wordstream explained. An automatic monitoring system reportedly signals the operator with an error message upon detection of a transmission error.

The interface may be purchased as a Wordstream option for $1,600 or leased for $37/mo on a 36-month basis, the Management Assistance, Inc. subsidiary said from 300 E. 44th St., New York, N.Y. 10017.

Decision Data Adds Serial Printer Designed for Users of IBM 3270

HORSHAM, Pa. — A serial printer aimed at IBM 3270 users has been announced by Decision Data Computer Corp.

The Decision Data 6540/02 printer is compatible with the IBM 3271, 3272 and 3274 control units as direct replacements for IBM 3284, 3286 and 3287 serial printers; and multiple 6540/02 configurations can replace IBM 3288 and 3289 line printers with improved overall cost/performance, the vendor claimed.

The 6540/02 prints bidirectionally at 120 char./sec over a 132-position print line. Each character of the printer's 96-char. set is formed by a 9-by-7 dot matrix, Decision Data continued.

Featuring a Decision Data Model 4000 character buffer, the 6540/02 printer with all interface attachments and maintenance costs $3,975; delivery is promised within 90 to 120 days of order.

The printer can also be rented for $130/mo to $175/mo, depending on contract terms, the vendor said from 100 Witmer Road, Horsham, Pa. 19044.

HP 250 Gets Terminal Option

PALO ALTO, Calif. — An asynchronous data communications capability is now available as an option for the Hewlett-Packard Co. Model 250 business computer.

Asynchronous data communications enhances the HP 250's capacity for applications development by offering five channels of full-duplex RS-232 or 20 mA current loop I/O from 110- to 9,600 bit/sec. This option also enables the user to attach peripherals with RS-232 interfaces, such as remote printers and terminals, and provides for asynchronous communications to HP 3000 computers by emulating an HP terminal, the firm said.

Converts Stand-Alones

The option converts what was previously a stand-alone computer system into an asynchronous terminal for a distributed system, a spokesman said.

The option, which includes interface card and system software drivers, costs $2,100. It will be sold primarily through commercial OEMs or directly to customers with in-house computer expertise.

The HP 250, a flexible disk-based business system that features data base management and software tools for report generation, forms handling and unprogrammed data access, was introduced in June and costs $24,000.

Miniterm Can Now Print And Transmit Data Faster

BURLINGTON, Mass. — Computer Devices, Inc. has enhanced the Miniterm Model 1201 receive-only terminal to provide faster printing speed and transmission rates.

The Miniterm 1201 can now accept burst transmission at up to 9,600 bit/sec in either a 2K or 4K buffer memory and print out at 50 char./sec, the firm said. The Miniterm 1201 features a thermal printer mechanism that previously could print only 30 char./sec.

These capabilities will now allow CRT units to "dump" a full screen of data into the buffer at 9,600 bit/sec and allow them to then continue with further editing while the previous output is printed, the firm explained.

The enhancement does not change the price of the Miniterm 1201, which is $1,385, the firm said from 25 North Ave., Burlington, Mass. 01803.

Modem Suits Private Lines; 202T-Compatible

FORT WASHINGTON, Pa. — An asynchronous, private-line modem compatible with the Bell 202T has been announced by the Tele-Dynamics Division of Ambac Industries, Inc.

The Tele-Dynamics Model 7202T transmits and receives serial binary data at rates up to 1,400 bit/sec on unconditioned, voice-grade leased telephone lines and up to 1,800 bit/sec on leased lines with C2 conditioning, the vendor said. Operation is full-duplex on 4-wire lines.

Features Self-Diagnostics

The Model 7202T was described as similar to the Bell modem and it is said to feature comprehensive self-diagnostics. Two front-panel switches permit fast selection of local test, analog loopback and digital loopback test modes, the vendor stated, adding that front-panel indicator lamps display control and data functions to simplify troubleshooting.

The unit costs $440 in quantities of one to three, Tele-Dynamics said from 525 Virginia Drive, Fort Washington, Pa. 19034.

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Protect Virtual Assets, Hammer Warns

By Howard A. Karten
CW Staff

ATLANTA — How good is your computer security? If you improve the security of your system with an audit, "the job you save may be your own," according to Dr. Carl Hammer, director of computer sciences for Univac.

While speaking at a session on "Computer Security Audits" at the Americas Univac Users Association (AUUA) meeting here recently, Hammer suggested that assets can be divided into two classes, physical and virtual. Physical assets — those that can be seen and touched — are, in some cases, a company's least important property, Hammer suggested.

However, the virtual assets are sometimes not only underprotected, but also liable to place many businesses in great jeopardy if destroyed.

Despite his stress on auditing, "no computer crime has ever been discovered by auditing — it has all be discovered by accident," Hammer continued. One classic case, involving a programmer on a financial application who decided to always round down and add the excess to a particular account, was discovered only when the programmer began bragging to his colleagues.

Managers must take three steps to avoid computer crimes in their installations, Hammer said. First, assets must be identified; second, scenarios of the threats to the data must be drawn up; finally, the cost of reducing these threats must be analyzed.

In addition to these measures, Hammer continued, the plan must be redeveloped yearly as situations change and backup facilities must be carefully evaluated.

As he stressed the backup aspect, Hammer warned, "Unless you have a written, binding, legal contract [that spells out every detail of a facility backup arrangement], you have no backup at all."

Prosecution Problems

Hammer noted that some cases are difficult to prosecute. He cited the case of a Rhode Island bank's management trainee who gave a branch office staff special instructions for "opening" a terminal [preparing it for the day's transactions] in the morning.

The employee had previously worked in the bank's head office, where he had set up some special programs and data on a reserved area of a disk.

Growing suspicious after several days, the branch staff discussed the instructions with the home office staff which, in turn, discovered that money was systematically being removed from dormant accounts to accounts owned by the trainee.

The money was replaced into the looted accounts immediately before any audit, Hammer explained, thus allaying the suspicion of auditors.

When confronted with the evidence of the scheme, the employee claimed, "I don't know anything about that — it must be some kind of computer error; the computer did it." Since the employee was not caught while actually engaging in this "shell game," and since the system itself was engaged in the action, the employee could not be prosecuted, Hammer said.

In the past 100 years, the nature of the manager's job has changed from managing masses of people to managing capital and has changed again from simply managing capital to managing data and information, according to Hammer.

(Continued on Page 46)

Itel Unwraps High-End AS/6; Claimed Faster Than IBM 3032

By Howard A. Karten
CW Staff

SAN FRANCISCO — The Data Products Group of Itel Corp. has announced a new high end for its Advanced Systems (AS) line of IBM-compatible mainframes that it claims is 1.1 to 1.25 times as powerful as an IBM 3032 or 370/168-3.

The AS/6 Model 2, which was designed and is being built by Hitachi, Ltd. of Japan, is three to four times as powerful as the AS/5 Model 3, the company said.

The processor is said to incorporate improvements in the hardware and microcode to achieve an increase in performance over the company's AS/6 Model 1. Among these are Virtual Machine Assist (VMA) and MVS/SE improvements in microcode and improvements in handling IBM virtual operating systems through the segment table origin stack.

The VMA firmware feature can reduce CPU cycle utilization by 10% to 20% under normal conditions when operating under VM/370 operating systems, the firm contended. The basic cycle time for the unit is 72 nsec; the same as for the AS/6 Model 1.

A spokesman for Itel said existing AS/6-1s will be field upgradeable to AS/6-2s for $200,000. These prices are expected to be stable for some time despite the fluctuating value of the dollar relative to the yen, the spokesman continued.

The system's introduction was apparently delayed from Itel's original intended announcement date; industry observers had expected the announcement sometime within the second quarter of this year. First deliveries are scheduled for the first quarter of 1979, the firm stated.

The AS/6-2 features air cooling and the use of high-speed, medium- and large-scale integration, according to the firm. In addition, the system uses a 64K cache buffer and a 16-byte-wide architecture.

An AS/6 Model 2 with two million bytes of memory, 7032 CPU, operator console and two I/O processors with a total of six channels will sell for $2,160,000 Itel said from One Embarcadero Center, San Francisco, Calif.

Speech Recognition on Way For Commercial Uses: Glaser

By Brad Schultz
CW Staff

CHICAGO — Speech recognition (SR) will be an effective means of commercial data entry for certain applications within the next several years and will occupy an important place in DP, even though it cannot match the performance abilities of optical character recognition (OCR) or keypunch input.

So said George Glasser, president of Centigram Corp., at a recent conference session here on "Front-End Systems to Speed Up and Improve Data Entry."

Although most people prefer to communicate by speaking, data can be read or typed faster than it can be spoken and understood, Glaser noted, indicating that OCR and keypunch technology will always have a place in DP operations.

However, SR will form a major portion of the semiconductor industry by 1985, he predicted, with SR products in the $1,000 range appearing "rather soon" and, following the trend of plummeting hardware costs, available in "the low hundreds of dollars" by 1982.

The former president of the American Federation of Information Processing Societies told the session that Texas Instruments, Inc., IBM, Univac and Rockwell International are among major vendors currently developing SR technology. TI is presently the leader, having already implemented SR on an LSI chip, he said.

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(Continued on Page 46)

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On-Line System Speeds Firm's Material Traffic

NEW ORLEANS — In the offshore construction industry, the speed at which a company can produce needed equipment and services is important to its success. Oceanic Contractors, Inc., international arm of the $1.2 billion J. Ray McDermott & Co., faces a daily problem of covering long distances and reducing very costly downtime.

"In a materials operation this size, with such a high percentage of priority items," L.C. Kibler, Oceanic's materials manager explained, "it is essential that we maintain maximum visibility of all facets."

To get the latest information on the 14,000 yearly requisitions, which include 63,000 line items, Oceanic makes constant use of an IBM 370/168 linked to a series of CRTs and printers.

Speed of response is critical when downtime at a derrick barge in the Persian Gulf Costs about $70,000 per day and a one-way trip by a chartered Boeing 747 to haul parts to Europe, the Middle East and the Far East costs $120,000.

According to Kibler, "we can now look at the total cost concept. Essentially, we are managing dollars, not material . . . The system enables us to analyze complex relationships such as item cost vs. priority transportation vs. downtime in the field. And it enables us to tell our accounting people what upcoming cash-flow needs will be."

Quick Feedback

Kibler said the on-line materials system used by Oceanic gives quick feedback on how well the company is supplying and servicing its overseas operation. Every requisition can be tracked and timed, he noted, from the time it is received, until the part arrives at its destination.

Overseas phone inquiries can be acted upon very quickly, and the system "enables us to monitor, analyze and improve the performance of buyers, vendors and expeditors," Kibler remarked.

To maintain efficiency, Oceanic uses the system to provide information on:

- Price/performance to measure actual purchasing, price against last price paid and market price.
- Workload including statistics which measure workload "in," backlog of current workload and workload completed.
- Cost savings to rate both cost reduction and cost avoidance.
- Administration and control including statistics used to track cost-per-purchase order and the ratio between purchasing budget and volume.
- Vendor quality and delivery to measure vendor performance in a variety of categories such as price competitiveness, delinquency rate, complete delivery vs. partial delivery, cash discounts allowed and so forth.

Oceanic supports much of McDermott's comprehensive engineering, fabrication and construction services, which are primarily marine-related. McDermott is involved in a wide variety of activities, from the design and construction of offshore and onshore oil and gas production facilities to the supply of diving personnel and equipment for underwater services.

For Oceanic to meet the needs of the McDermott enterprise, the company needs to give its managers information that will improve their ability to manage the material and the millions of dollars each must handle every year.

Requisition Process

When requisitions come in from the field, they are categorized by priority numbers from one to five, in descending order of urgency. Requisitions can be fed into any one of six 3270 CRTs.

The computer prints a weekly report called "Age of Outstanding Requisition," which lists the number of open requisitions by buyer, including their priorities and age brackets — zero to 10 days, more than 15, more than 30, more than 60 or more than 90. Orders placed with vendors are processed by the system, and purchase orders are returned to the buyers for inspection and signature.

Computer plots of purchasing trends allow Oceanic to foresee the need for additional buyers or for additional manpower to speed service.

Number of Aids

Expediters are provided with a number of aids to communicate effectively with the field or with a vendor. A weekly Outstanding Items Report, with data on the status of all open orders, allows the expediter to concentrate on priority orders and delinquent items.

Oceanic's traffic section handles all material once it is ready to ship from the vendor.

All through the shipping process, the computer is fed information on shipping dates, notification to the field that an order is about to be filled — and who will carry the material — and when the material will arrive.

When the material reaches its destination, information is sent via Telex to update records in New Orleans.

The on-line system was implemented in three phases: purchasing, in May 1977; expediting in April 1978; and traffic in July 1978. In September 1978 the Model 168 was to be replaced by a Model 3033 which is faster and cheaper.

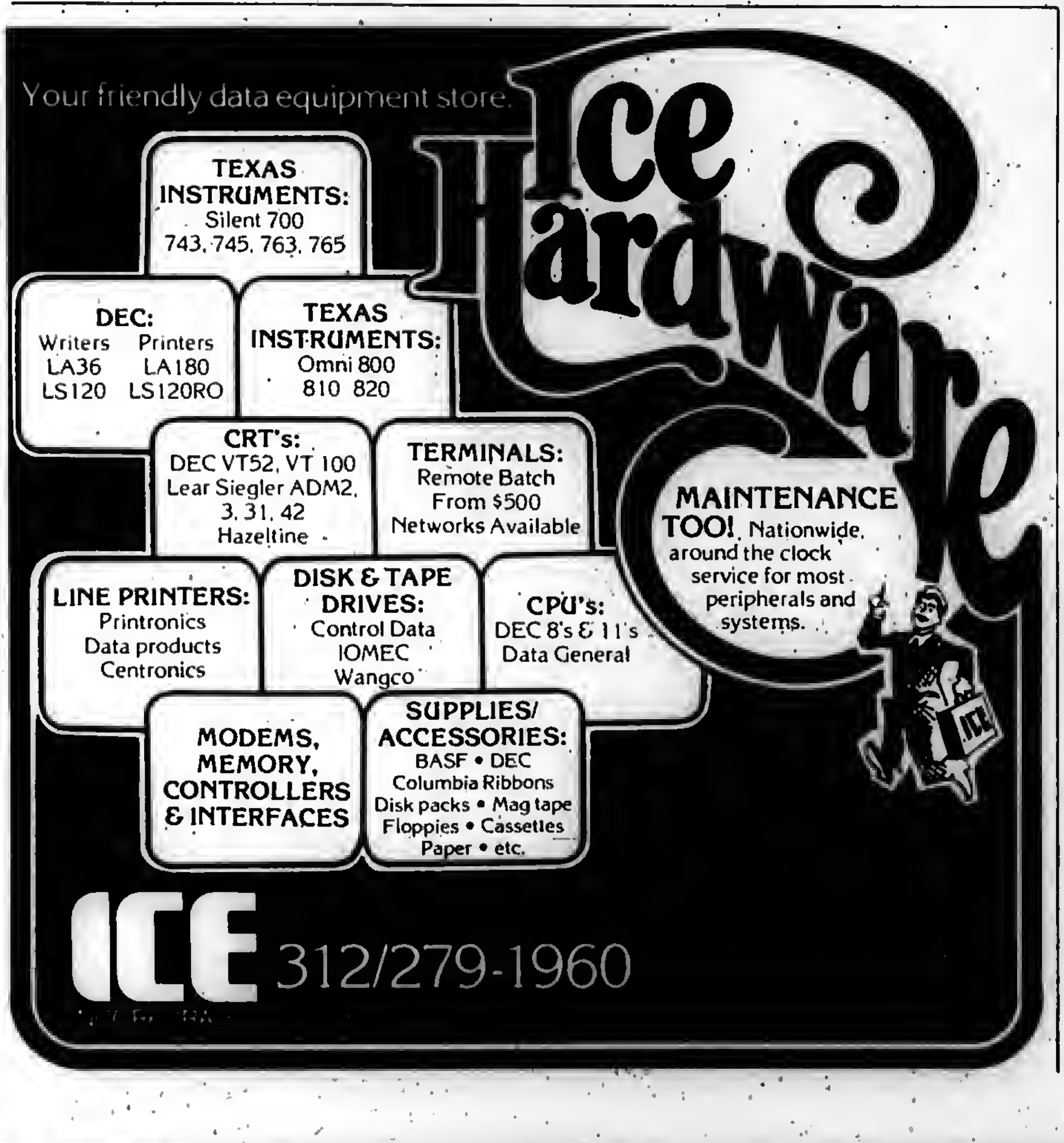
Looking to Future

"Looking a little further into the future," Kibler explained, "we anticipate establishing on-line systems between our office and key vendors within the next two to four years. This would eliminate the need for prepurchase entry, bid documentation, purchase requisitions and purchase orders."

"As I see it," Kibler continued, "an on-line system contract would be negotiated with selected vendors on an annual basis. Based on each vendor's performance over a given year, we would determine whether we would place additional business with that vendor, or, simply put, find other more qualified vendors.

"In summary, we receive many advantages from the on-line system. But perhaps the chief benefit is the timely information, available at a moment's recall," he said.

"It enables us to take corrective action as is necessary and to track and analyze virtually every aspect of our operation. As a result, individual personnel, and the materials organization as a whole, can provide an optimum response to the urgent needs of the field."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Disk Packs Suit CDC, Ampex, Calcomp Drives

BEDFORD, Mass. — The BASF Systems Division of BASF Wyandotte Corp. has introduced three disk packs for use in drives manufactured by Control Data Corp., Ampex Corp., and California Computer Products, Inc.

The 300M-byte T-300 disk pack can be used on Calcomp T-300 drives and others compatible with the Calcomp unit, the firm said.

A removable disk pack introduced by the company will be available in either a 40M- or an 80M-byte model and is said to be compatible with CDC's 9760 and 9762 systems, as well as the Ampex DM 940 and 980 drives.

The 80M-byte module, now available, sells for $400, according to a company spokesman. Price and availability of the 40M-byte model will be announced shortly, the spokesman added.

The T-300 will sell for $800.

Quantity discounts on the products are available when 10 or more are ordered, the firm noted from Crosby Drive, Bedford, Mass. 01730.

Cartridge Tape Drive Has Capacity of 17.28M Bytes

PASADENA, Calif. — A cartridge tape drive said to provide the highest capacity of any such drive now available has been introduced by Data Electronics, Inc.

Called "The Funnel," the drive has a capacity of 17.28M bytes (unformatted) according to the company, and a data transfer rate of 192K bit/sec.

Features on the drive include an integral tape drive, dual gap, read-while-write tape head with separate erase head and long-term speed variation of 2%. The drives do not include a formatter or interface.

The Funnel sells for $1,000 with minimum electronics and $1,300 with maximum electronics (in OEM quantities) from the firm at 370 N. Halstead St., Pasadena, Calif. 91107.

Mainframe Helps Port Control Shipping Data

HOUSTON — Computers are being put to work here to help the Port of Houston keep track of its data relating to containerized shipping.

An IBM 370/115, running a program called Container Information Control System (Conics), helps the port monitor the status of each container from the time it is unloaded from a ship until it is reloaded on an outgoing truck, or vice versa.

"Conics has helped us streamline our operation and keep costs at a minimum," according to Gregg Seaman, manager of the terminal. The system, an adaptation of a similar one used since 1969 at a terminal in England, stores information about the location, contents, condition and destination of containers in the $53 million facility. The port is believed to be the first U.S. user of the system.

In selecting the 370, the Port Authority also considered several other systems, but rejected them when it found that the English version of the system could be adapted to meet its needs with a minimum of alteration. One reason for rejecting some other approaches was the fact that data had to be entered manually — an impracticality for a facility handling 150,000 containers yearly.

Tracking Process

The system's involvement with containerized cargo begins when cargo arrives at the terminal building. Controllers at CRTs enter data about each container as it arrives; the data is then stored as required.

Containers destined for export are recorded when an incoming truck enters the building. Using the shipper's documents, controllers enter data such as identification number, weight, destination, shipper and contents. The system records the information and prints an Equipment Interchange Receipt (EIR); in addition, based on the type of cargo — hazardous or nonhazardous, refrigerated or nonrefrigerated, weight classification and so on — the system assigns a general location in the facility to the container.

A copy of the EIR is returned to the truck driver as a receipt; the remaining EIR copies are eventually forwarded to the port's accounting department and the steamship company. Once the container has been placed in its assigned area, its position is reported to the controller, who enters that information on the CRT.

Conics is later used to assist in drawing up a stowage plan for the departing ship. Using the CRT to locate containers in accordance with the Vessel Loading Plan, the park controller radios the crane operator with instructions for loading the containers on the ship. Their shipboard location can be printed and available within minutes after the last container has been stowed. The procedure is reversed for import containers.

Rigorous Security

During the entire time a container is handled by the Port of Houston, security precautions are rigorous. A list is maintained of all transactions, the time they occurred, who entered them and what terminal was used. In addition, the system issues a warning message if a container does not follow its predetermined course, and it reports on irregularities such as full containers that are suddenly classified as empty.

Conics makes it possible to provide daily reports to the Terminal Office and the steamship companies showing all containers in inventory, all boxes received or delivered and any corrections made the previous day. Weekly reports show boxes remaining in the park area after seven and 14 days, and lists of containers discharged, as well as stowage lists, are provided to the agents of arriving and departing ships. Each departing ship takes with it a list of all outbound containers, by port and destination.

"Conics will allow us to maintain our quality of service as the number of containers we handle increases," Seaman said, adding that the terminal gains the following advantages by using the system:

- Efficient container handling. There are no delays because of slow documentation or poor control.

(Continued on Page 46)

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Speech Recognition Coming in Some Areas

(Continued from Page 43)

SR, the Pentagon's Advanced Research Projects Agency (Arpa) has to date spent $15 million on "assessing the field," he added.

Glaser said SR applications are also expected in applications where a user can benefit from natural language query computing that leaves the operator's hands free, such as surgery or warehouse operations.

Glaser projected that within 15 to 20 years a businessman will be able to talk to a typewriter and receive clean copy of his words as a result. Closer to the present, SR will serve as a means of identity verification.

To gain access to classified information or a classified physical area, an individual orally identifies himself to the system, which then compares his voice print with its library record of the named person, Glaser explained. A successful match of the two voice signatures allows the data to appear on a terminal or the doors to open.

This principle is analagous to the "automatic [written] signature verification system" recently invented by IBM [CW, Oct. 16]. Comparing the two forms, Glaser said the SR approach is more economical, because less than 100 bytes of information are needed to encode a voice identity, while about 900 bytes are needed for a written signature.

Most business is conducted using a vocabulary of 1,000 words — a limit that might reflect poorly on the average business intellect, Glaser remarked, suggesting that 1,000 words is the extent of fluency commercial SR products are likely to attain in the next decade.

Voice Variability

The critical problem facing SR researchers is the variability of the human voice, Glaser said, observing that a calm and sober individual will pronounce a given word differently than he would if he were drunken, tired or in pain. Accents are another difficulty: through the next several years, English-language SR systems will probably exclude nonnative English speakers — for example, a Frenchman who learned English.

Scientific applications of SR may prove difficult since pronounced digits are easily confused — for example, "five" and "nine." The U.S. Air Force lists the digits zero through nine as among the 14 most commonly misunderstood words in voice communications, Glaser added.

Sharing the podium with Glaser was James A. Wilson, DP superintendent for State Farm Mutual Automobile Insurance Co., who noted that dropping hardware costs and climbing labor costs are lowering the demand for keypunch technology, while raising the demand for OCR.

Wilson told the session that OCR allows the source document to be the input document — an important advantage over keypunch operations. With OCR, users can fill out a form that is input to a system without intermediate handling (i.e., media conversion or transcription), he explained, adding that data entry applications requiring rekeying can be economically designed for OCR devices.

By incorporating OCR technology in place of keypunch, State Farm has improved productivity — measured in policies processed per employee — from 2,500 in 1965 to 6,000 in 1977, Wilson said.

Mainframe Lends Control To Shipping Operations

(Continued from Page 45)

- Minimized administration costs. Documents generated by Conics are better organized and more informative; the system automatically produces EIRs, eliminates hand-sorting and transcribing and performs editing, cross-checking and input validations.
- Tight security. Detailed transaction listings, audit checks and reports of exception contribute to a high level of security.
- Employee safety. Physical checks of container movements are needed less frequently, reducing the risk of moving among the containers.
- Superior customer service. Operators can schedule work to their own best advantage. Information is instantly available, resulting in less congestion at the wharves, better scheduling and more precise documents — an advantage for customers as well as for the port itself.

Conics increases profitability for shippers because it allows ships to spend less time at port. Faster loading and unloading improves the profit picture for shippers. Containerization, itself a concept whose major advantage is quick turnaround time, is supported by the addition of Conics, according to Seaman. "With assistance from Conics," he added, "we can load and discharge a [large vessel] in 24 to 36 hours."

Bruce Lyle, director of DP at the port authority, said Houston handles about 25% of its general cargo in containers, but in the next 10 years, "that figure could reach 60% to 70%."

Lyle said the low volume to container traffic gave the port time to work out operational difficulties and that now, "we have the efficiency and ability to expand our service with a minimum of expense.

"Today we are in a position to offer our customers a total container control package. And in addition, we can offer reporting capabilities that, to my knowledge, no other stateside port can match," he said.

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*Requires Phone 1's P1-5 MUX controller when used as 3277 replacement.

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Protect Virtual Assets, Hammer Admonishes Users

(Continued from Page 43)

In an incident in California, a programmer decided to hold a tape of the company's accounts receivable for ransom, Hammer said. But the programmer was killed in an auto accident and the tape was destroyed. Two weeks after the incident, the company was bankrupt as a direct result of the programmer's action, the Univac official noted.

For individuals, too, many assets are virtual in form. The nation's largest brokerage firm "maintains several billion dollars worth of securities on a computer," he said, leaving to the audience's imagination the result of computer catastrophes in that company.

Unique Profile

Security in any DP installation should take into account that "computer criminals" have a profile different from more traditional criminals, Hammer maintained.

First of all, these are white collar criminals, often educated and usually working on the inside. They rationalize their crimes as taking money from a wealthy company, a thing, not an individual.

Second, in most cases, they are amateurs, not members of organized crime. However, users should not be lulled into a false sense of security by this fact — "organized crime is only beginning to become aware of the possibilities."

Third, the typical computer criminal — who is "not a dummy," Hammer reiterated — "frequently has a home computer and enjoys the challenge of computer systems." Finally, he is typically a disgruntled employee.

But the key question, Hammer pointed out, is, "How disgruntled?" Almost everyone can be considered disgruntled to some extent, he concluded.

Printhead Added By Gulton

METUCHEN, N.J. — A 20-column-wide, gangable dot matrix thermal printhead recently introduced by Gulton Industires, Inc. was designed for medium-speed alphanumeric strip and page printing applications.

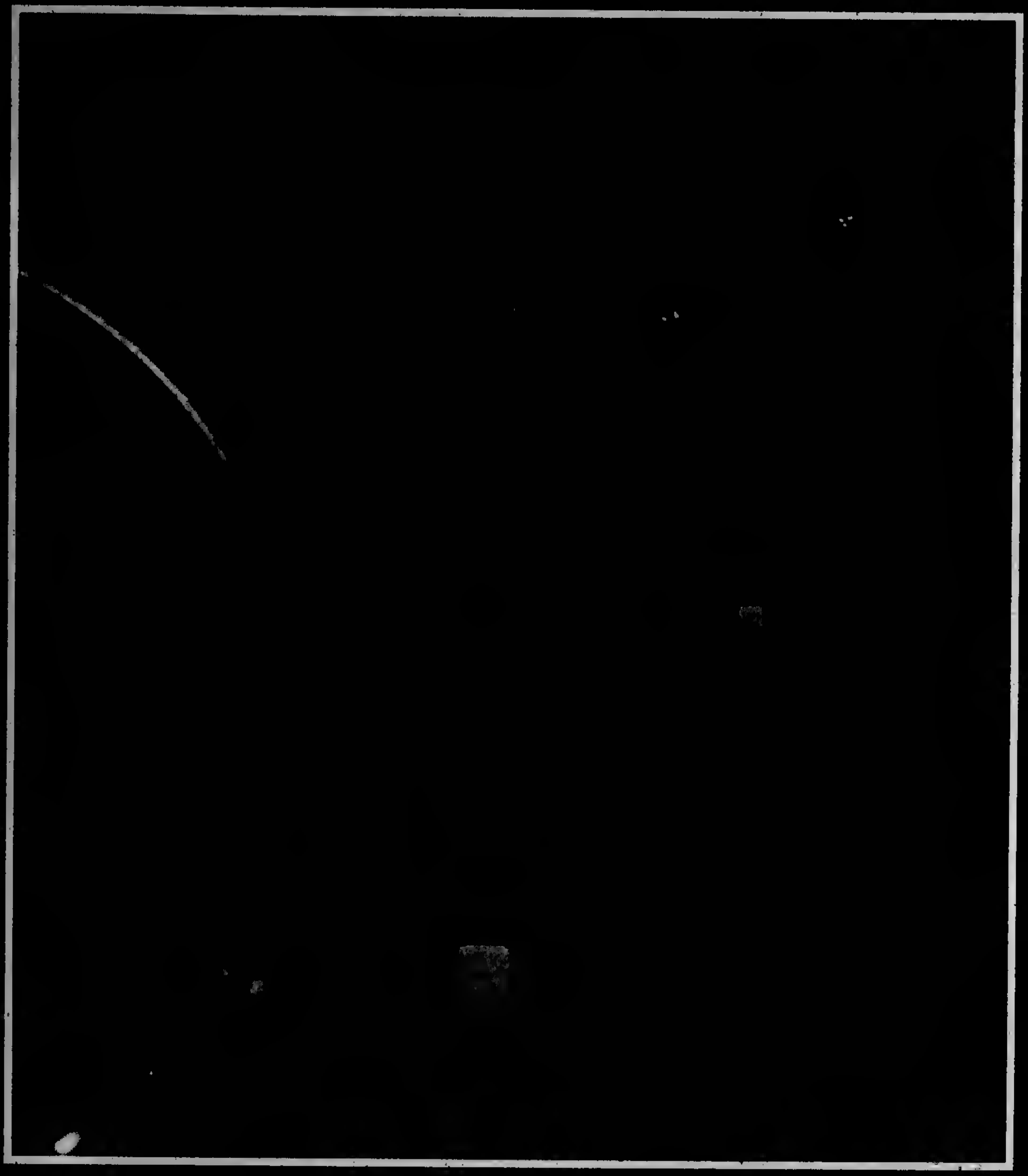
The DM20100 permits nonimpact printing, thus making possible printers that have only one moving part, the paper advance mechanism. Line speeds up to 7 line/min are possible with the unit, a spokesman said.

The unit prints a 5 by 7 dot matrix character on standard heat-sensitive paper, the company stated.

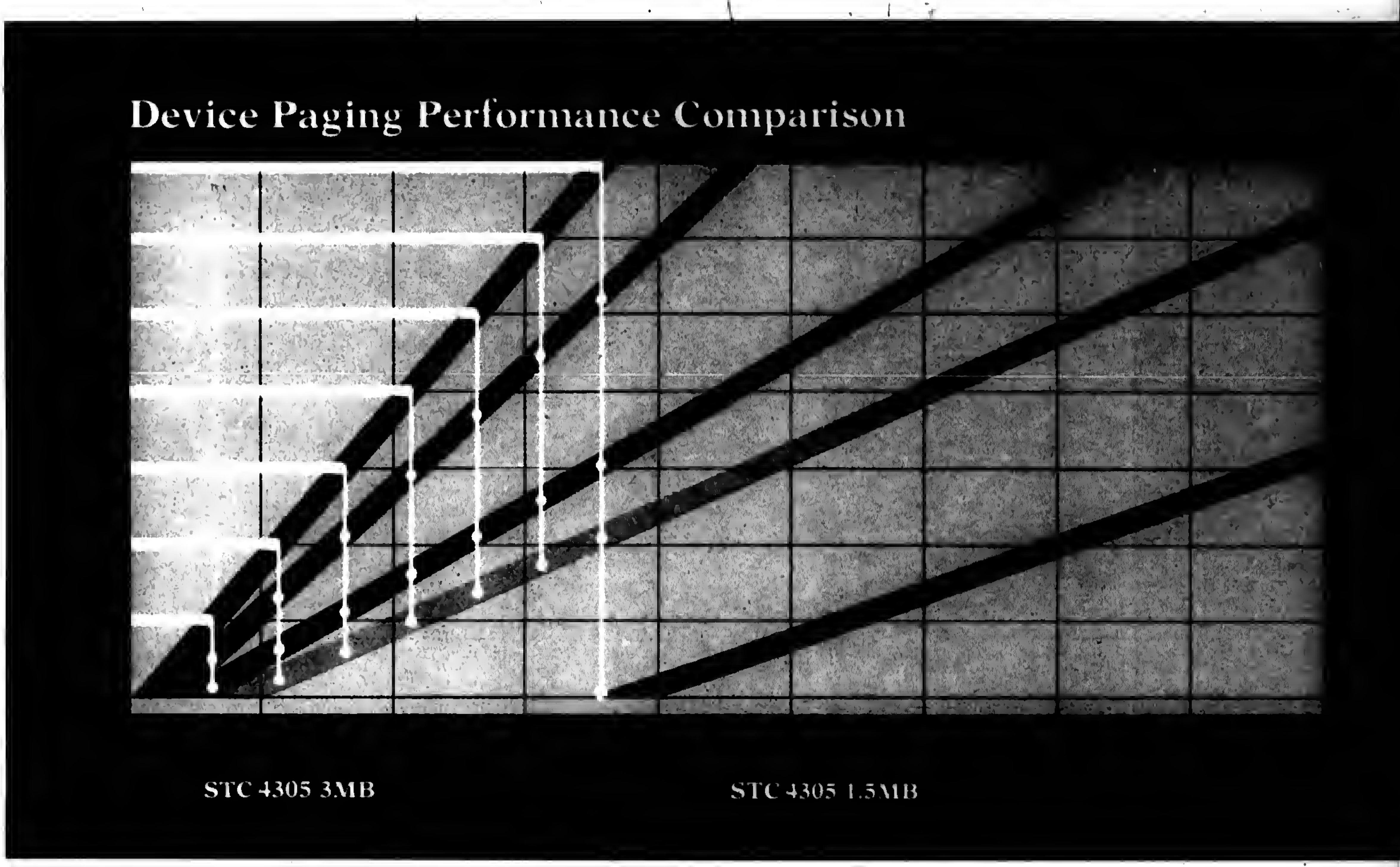
Mean time between failure is a minimum of 10 million character lines at maximum rated speed and is aided by a redundant design of the print element, Gulton said.

The device costs $106.55, or $66.60 in quantities of 100 to 499, from the company at 212 Durham Ave., Metuchen, N.J. 087840.

Storage Technology's new disk system: Doesn't spin. Doesn't seek. Doesn't fly.



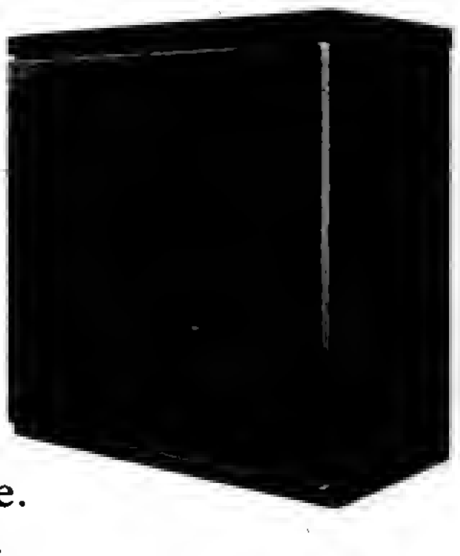
STC introduces the Solid State Disk: It gives you faster virtual storage paging for a fraction the price of the fastest drum.



Until now, you've had three options to improve virtual machine performance, all of which were expensive: upgrade the CPU, add memory, or add drum storage.

Today, there's a better answer: The STC 4305 Solid State Disk. In a basic configuration, it gives you 134% of the virtual paging rate for 50% of the cost of IBM's 2305 Fixed Head File. Better still, Solid State Disk's capability grows faster than its price. You can add options to increase its performance more than five times that of the 2305, yet still pay 20% less.

The best of both worlds: plug compatibility with superior performance.



Your CPU will think Solid State Disk is an IBM 2305 in every respect but performance. It runs with no software modifications under all releases of OS, VS1, VM and MVS operating systems. An STC field engineer simply plugs Solid State Disk into the block multiplexor channel of your 370 (135 or above), 303X or PCM equivalent CPU. They lead you through a straightforward conversion procedure. And you're ready to reap the performance benefits of the Solid State Disk's unique semiconductor, charge-coupled device (CCD) architecture.

For instance, with Solid State Disk, you get 0.7 millisecond access time vs. 5 milliseconds for the 2305. Storage capacities up to 45 Megabytes vs. 22.5 Mbytes. And selectable channel rates of 1.0, 1.5 and 3.0* Mbytes per second vs. a fixed 1.5 Mbyte rate.

This latter feature, when combined with dual channel option, lets you share your Solid State Disk among processors with different channel characteristics. Add the powerful dual port capability, and you can attach to more processors, or gain concurrent access for a 2.0, 3.0, or 6.0* Mbyte/second aggregate transfer rate.

---

* 3.0 Mbyte/second and 6.0 Mbyte/second (aggregate transfer rates are options and require two byte wide interface from IBM.

Lowest cost of ownership. When it comes to cost, Solid State Disk is a real penny-pincher. It costs less to buy, because it's easier to build. There are no critical mechanical parts to precision machine and assemble, just straightforward IC and PC board fabrication. In your data processing center, a typical Solid State Disk Configuration saves you 65% of the space required by the 2305, cuts power consumption by 60%, and reduces heat dissipation by a healthy 66%.

Extensive FE controls, coupled with a built-in microprocessor, enable STC field engineers to service your Solid State Disk in-line, off-line, or on-line. And because all components are modular and field replaceable to the module, board or chip level, you get the fastest time-to-repair at the lowest possible cost.

Solid State Disk: Just one of the ways STC helps you get more for less.

The Solid State Disk is just one of many STC products and services designed to help you get more productivity, and more useful life out of your IBM computer. And do it with significant cost savings in both purchase price and operating expenses.

If you have the impression that one of every three tape drives is ours, it's more than an impression. If it's ever seemed to you that everywhere you see medium and large-scale computers, you see our name, it's not just an impression. Over the past nine years we've installed 22,000 tape drives—or about 30% of all tape drives installed during that period of time. In fact, today STC makes more tape drives for medium and large scale systems than anyone else, including you know who.

The secret behind this success isn't any secret at all. STC tape drives deliver superior performance at a very attractive price.

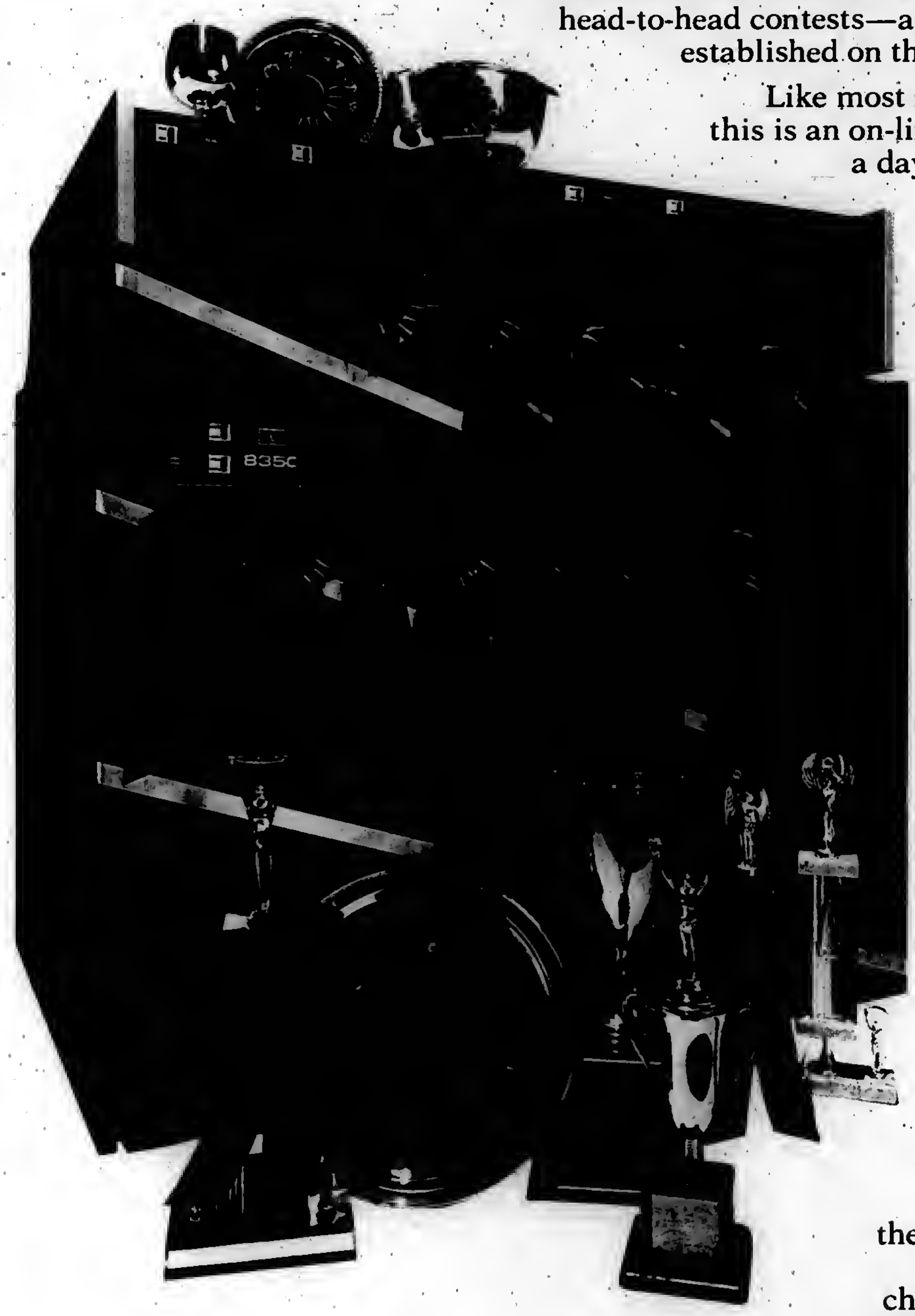
For instance, only STC drives incorporate SPAR, a unique, built-in diagnostics system that took 16 man-years to develop, and that allows our field engineers to perform all diagnostics and maintenance off-line, on-line, or in-line. Which is just one reason why national reliability studies show STC drives outperform IBM equivalents. So when you choose Storage Technology, you get more than performance. You get availability, serviceability, and reliability.

Now, to our customer (and you know who you are) who is still using STC tape drive 001: Come on. Give us a break. How long will a STC tape drive last? After 9 years, we still don't know. You see, the first engineering prototype we built back in 1969 is still being used by a California-based electronics firm. It hasn't had a service call in over two years. And our first production model, serial number 001, was field-converted from a 2450 to a 3470 (IBM 3420-7 equivalent) two years ago, and is also still being used heavily by one of America's largest retailers. So we're beginning to wonder if they'll ever buy a replacement. In the meantime, we'll keep giving them the same great service that's made our field engineers a legend in their own time.

Help, police! Creativity can sometimes make the difference between good service and great service. For example, can you imagine yourself asking the police to pick you up? That's what a couple of our field engineers did during Boston's driving moratorium last winter. An STC customer had a significant problem, and since the only legal way to drive was with a police escort, our people had to call for police assistance to reach the site.

Now, we obviously don't relish the image problems that might result from our FEs riding around in squad cars. So we're thankful that this was a rare event during the 3-day, 12-state storm. But it does underline why STC field engineers are popular enough with our customers to top the June **Datapro** report with a 3.6 rating.

Why the 8350 has never lost a contest. Fixed media disk users are a very picky lot. Many of them demand vigorous benchmarks before buying a winchester drive. The STC 8350 is used to winning these head-to-head contests—a pattern of success established on the very first installation.



Like most fixed media disk applications this is an on-line system running 24 hours a day, seven days a week. Anticipating typical new product problems, we arranged for this customer to provide computer time for engineering work. As it turned out, we didn't need even a fraction of a CPU second. During the 90 day test period, there wasn't a single hardware failure.

That performance was designed into the 8350 from the outset with such features as fully redundant electronics and power supplies. Elimination of discrete components in favor of easily serviced PC boards. And MIDAR, STC's proprietary diagnostic package designed to quickly direct the field engineer to a problem component for fast repair.

How would the 8350 measure up in your environment? Why not put us to the test? As the leading independent supplier of high-performance fixed media disk drives, we can provide you with the product, the experience and the service resources to satisfy your most challenging requirements. We'll even guarantee it. In writing.

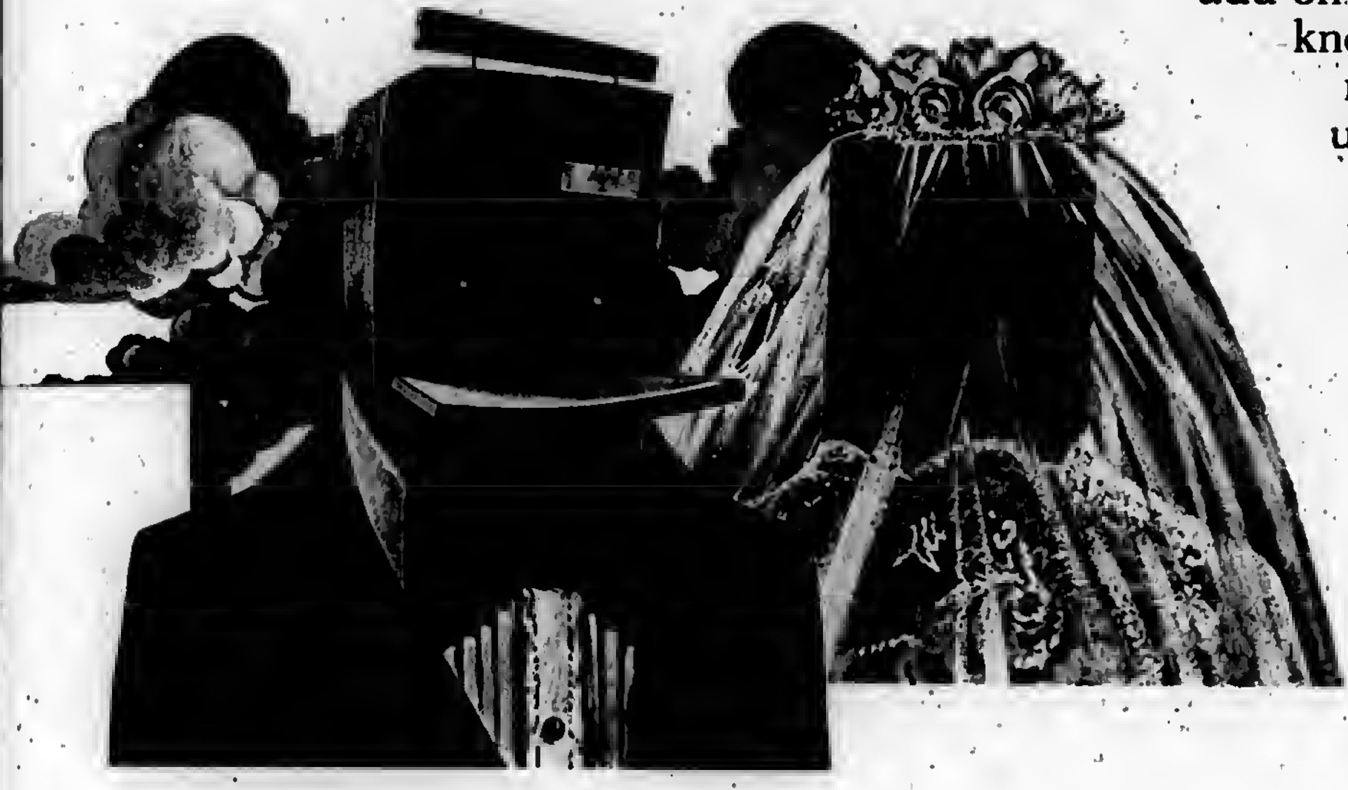
Tips and tools to tune up your storage subsystem performance. How many channel tries before you get a start I/O? Are catalog requests idling in the queue? What's the distribution of your data sets by size? By frequency of access?

STC Systems Engineers can help with answers to questions like these to squeeze more mileage out of your existing storage equipment, and help you plan for more efficient system growth. They've helped our customers solve a wide range of storage problems under virtually every conceivable combination of CPU, operating system, and job mix. Their experience is now at your disposal in the form of free software packages.

Some of the tools you can put to work today include Configuration Planning Software with programs for evaluating tape and disk data set characteristics. High Speed Dump/Restore. And Performance Maximization, among others.

Our philosophy in providing these tools is simple. If we help you get more from what you have today, you'll probably want to do business with us when you're ready to grow tomorrow.

Before you wed your CPU to an add-on memory, check out their hand holding. You know that when it comes to add-on memory, installation and service are as important as hardware.



So you should know that our STC field engineers have over 250 Mbytes of large system memory experience (including more 168 add-on than any independent). So they know how to get you up and running fast. STC's new family of 158, 168 and 303X add-on memory uses the latest MOS technologies. They have fewer components for fewer failures, reduced power consumption and less heat dissipation. Their modular design makes for an easy growth path, too. All our people have to do to give you additional capability is plug in additional cards. This typically takes less than a shift, including the diagnostics. And if that's not enough to convince you, price and availability should be. Because STC add-on memory costs 30% to 50% less than IBM's. And it's available today.

For more details on STC data storage products and services, call your local STC sales office. Or clip and mail the coupon below to: Storage Technology Corporation, Mail Drop 3M, 2270 South 88th Street, Louisville, Colorado 80027. Phone (303) 497-6262.

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CW 11/6/78

Before Technology Reaches Limit

Lecht Predicts 10-Fold Price/Performance Gain

By Howard A. Karten
CW Staff

ATLANTA — The next eight years will see a 10-fold improvement in the price/performance ratio for large-scale computers, but then technology used in large processors will reach its improvement limit, thus halting — at least temporarily — the improvement in cycle time and other measures of speed, according to Charles P. Lecht, author and president of Advanced Computer Techniques Corp.

Furthermore, by the mid-1980s, natural language programming will have become a reality, replacing the "junk" now used to communicate with computers, according to Lecht. This will result in a reduction in programming, as we now understand it, and a corresponding increase in computer productivity.

In a keynote speech before the annual fall Americas Univac Users Association (AUUA) meeting here recently, Lecht noted that despite impressive price/performance data in the computer industry, "this kind of savings in price/performance has always meant higher costs for us, of course, because we have to keep buying more and more."

The keynoter said that in the 1980s, users will have some big decisions to make about investing capital in automation. These will include how much hardware should be in places other than offices — in homes, for example; how much hardware should be provided by a large computer utility and how much by the user; what plug-compatible components should be bought and other tough questions.

The net result, Lecht predicted, would be that "the whole aspect of guiding investment in DP will be a tough job, to be held by graduates of our most erudite institutions."

Aiding these decision-makers will be operations research specialists, who will emerge again as they did following World War II and again, he added, there will be a shortage of them.

Lecht advised the audience, "tell your children to study library science and linguistics if they want to be effective in the computer industry of the future." He also forecast a "mix and match" method of building systems in years to come with users deciding what services to buy and then simply combining them. "The user who is most technically inclined will be the best off in the 1980s," he predicted.

Lecht also said that despite others' predictions he did not see a bright future for the minicomputer business, a prediction other people find "extraordinary."

"I think the future is not in intelligent devices, but in dumb devices. In my view, a dumb terminal is what I want, something which adjusts to me. I want to . . : let it figure out what I want."

In equipment generally, the trend will be toward the elimination of moving parts, Lecht remarked, and added, it was his belief that bubble memories would eventually replace fixed-head disks and drums.

Echoing Charles Sporck, of National Semiconductor Corp., Lecht stated, "Chip manufacturers are the computer manufacturers of the future," but, he added, too much large-scale integration has its drawbacks.

Switching Power Unit Introduced by Calex

PLEASANT HILL, Calif. — Calex Manufacturing Co., Inc. has introduced a 5 V, 5 A switching power supply that reportedly features 80% efficiency, overload protection at 6 A and 50 mV (maximum) ripple.

The Model SR1.5.5 is said to be the world's smallest line-operated switching power supply. The encapsulated unit has a five-year warranty and a recovery period for transient response of less than 2 msec, the company said.

The unit sells for $98 from the company at 3355 Vincent Road, Pleasant Hill, Calif. 94523.

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IBM took a giant stride in computer technology to create the new System/38.

The result can be a giant stride in efficiency for your organization.

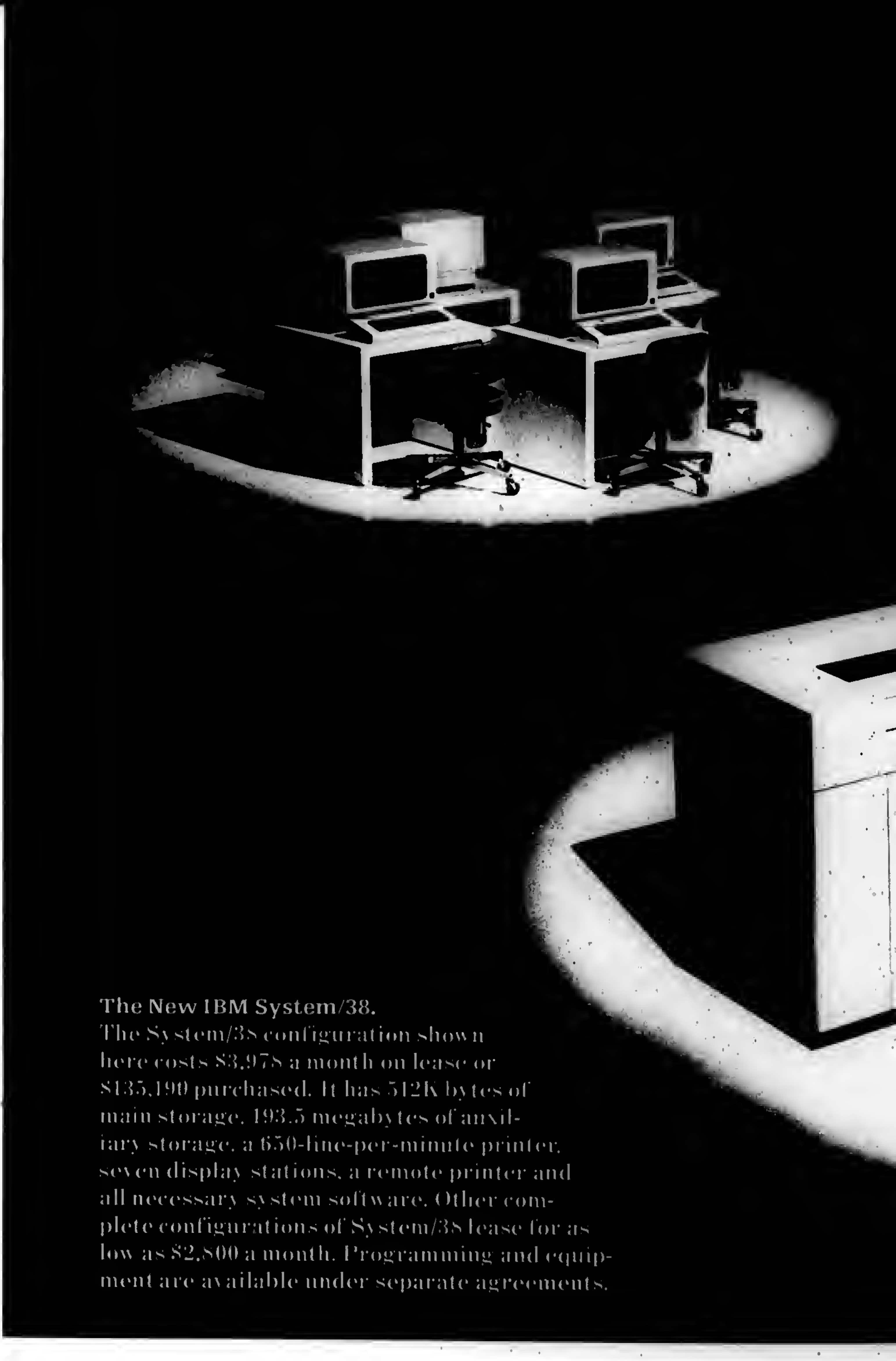
IBM System/38 is a new breed of small computer.

It's compact in size. Affordable in price. And as a general business computer, it's exceptionally well suited to a wide range of organizations. They include firms from about $5 million to $100 million in sales, as well as units of larger companies.

But that's where its smallness ends.

Because in creating System/38,

Turn the page ▶



The New IBM System/38.
The System/38 configuration shown here costs $3,978 a month on lease or $135,190 purchased. It has 512K bytes of main storage, 193.5 megabytes of auxiliary storage, a 650-line-per-minute printer, seven display stations, a remote printer and all necessary system software. Other complete configurations of System/38 lease for as low as $2,800 a month. Programming and equipment are available under separate agreements.

IBM thought on a very big scale.

And System/38 can have a large impact in stepping up the efficiency and profitability of the organizations which use it.

Big computer functions in a small system

System/38 is designed to let any organization enjoy the productivity advantages of online applications typical of large-scale computers.

Specifically, IBM sought to incorporate in a simple-to-operate smaller system advanced functions that make work station applications easy to design, install and maintain.

Functions like an integrated online data base with data base management. Single level storage. Simplified computer-aided programming. Total system management through a central control facility. Real-time inquiry and update. Online training capability. Data integrity and security.

A tall order, you'll agree.

Especially for a system leasing for as little as $2,800 a month.

Yet IBM System/38 has *all* the features listed above – and more. Not just some of them. Every one of them.

Together, they provide what may be the most attractive package of computing benefits ever offered to business.

What can System/38's functions mean to your organization?

Let's review them briefly.

Distributed online work stations

One of the biggest advantages of System/38 is that users don't have to come to the computer to get the vital information needed in their jobs. Instead, the computer comes to them where they work, by means of online display stations and printers called work stations.

As many as 40 local work stations – as well as additional remote work stations – can communicate with System/38 interactively. They can bring the power of the computer to people doing totally different jobs. At executive desks, in departments, plants and warehouses. Across the hall or across the country. And the same up-to-date information will be available concurrently to all authorized users for real-time inquiry, change or update.

The value of System/38 in keeping everyone up to date can scarcely be overestimated. It can mean hundreds of thousands of dollars saved in operating efficiencies.

A self-managed system

There are two aspects to computing: processing the data itself and managing the system that processes the data. System management can consume a great deal of expensive time and talent.

System/38, however, has a remarkable internal facility that eliminates much of the complexity of system management. Called the Control Program Facility, it monitors and manages system activity – including the flow and processing of data. As a result, users and programmers are free to concentrate on their own jobs, rather than worrying about how the computer performs its tasks.

Central online data base

Instead of having separate data files for each application – one for or-

Photo is of design models and display screens are simulated computer displays.

der entry, for example, and another for inventory – System/38 lets you combine data for related applications into a single online data base. The integral Data Base Data Management facility presents data in whatever format and sequence is required by the user.

Every user can be in touch with the same central source of information. When data is updated for one application – say order entry – it's available for all others using that information, such as production, shipping, accounts receivable and inventory. Duplicated and conflicting data can be eliminated. Information is easier to retrieve, revise and use.

Streamlined programming

Both new and experienced programmers will find their work simplified and speeded with System/38. Thanks to advanced technology, many functions that ordinarily require programming have been absorbed by the system.

For example, System/38 offers a powerful "query" function which can break out data in the data base as required by the user and present it in the desired sequence and report format – without conventional programming. Executives can use a work station at their desks to obtain special management reports in minutes, rather than days or weeks.

version of the familiar RPG language, programmers are given new freedom to tailor processing of data and flow of logic to the needs of an application. Moreover, new application programs can be compiled, tested and "debugged" from any work station – in real time and using real data samples – while regular processing continues without being

More on System/38, turn the page ▶

affected. This means that a programmer is no longer burdened with manual coding, card punching and waiting for test time and results.

In short, System/38 can mean greater programmer productivity. Streamlined programming like this benefits both the programmer and the user who want results fast.

Single level storage

Another feature that makes for operating efficiency is an extension and simplification of the virtual storage used in larger computers. In System/38, IBM has taken this technique a big step further with the concept known as Single Level Storage Management.

It treats *all* storage – both main and auxiliary – as a single unit or level and automatically keeps track of everything stored in it. Users, particularly programmers, no longer need be concerned about program size or location or any other aspect of storage management.

Online training

As more employees become involved with the computer, training them in its operation becomes an important task. With System/38, your people can get "hands on" experience at live work stations, using actual data files – without fear of record destruction and without interfering with the use of the system by others.

And the prompting and guiding messages flashed on the screen can aid both trainees and regular users alike. There is even a "HELP" key for use whenever further assistance is needed.

Data integrity and security

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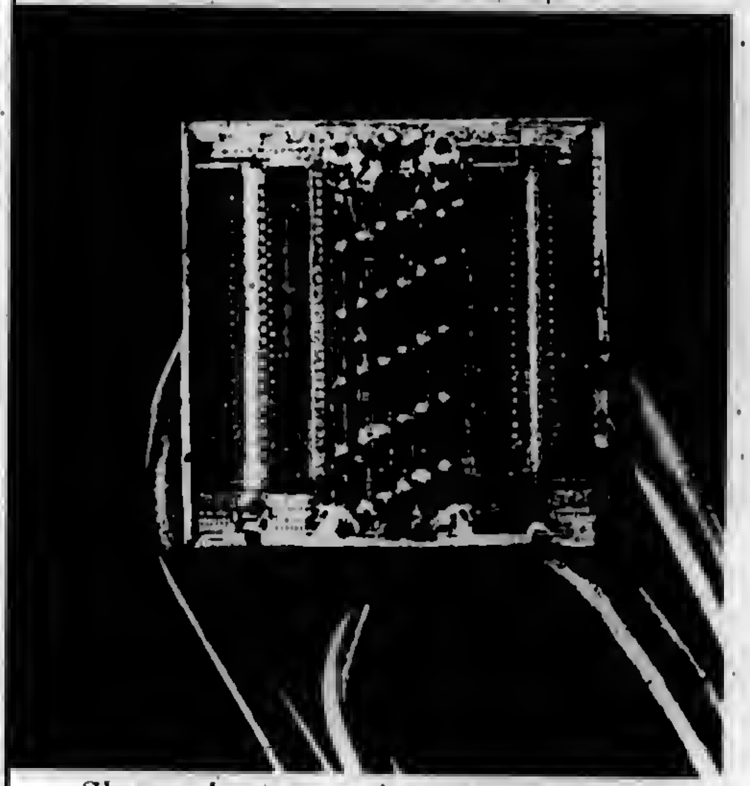

Shown about seven times actual size, a 64K chip is depicted on a paper clip.

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Locating Transposition Errors: A Rebuttal

By Robert B. Higgins

IN DEPTH
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IN DEPTH

The basic concept presented in Irwin Kraus' "Locating Transposition Errors"[CW, Oct. 9] is very worthwhile, but much of the information in that In Depth article was dangerously misleading at several levels. The problems can be summarized under three headings:

- The method goes too far.
- The method doesn't go far enough.
- The Cobol code does not correctly implement the method.

"New, improved" methods like Kraus' can be treacherous if their probabilistic nature is misunderstood or forgotten. It's somewhat comparable to giving penicillin injections for every illness without checking for allergies. Some people will be helped, some will be unaffected, but a few will predictably drop dead of a massive allergic reaction.

The immediate danger of a data entry "allergic reaction" to Kraus' method needs to be counteracted immediately.

Within the first three paragraphs of his article, Kraus convinced himself that *any* divisible-by-9 discrepancy in batch totals *must* be caused by a single occurrence of adjacent-digit transposition ("The enhanced method identifies a subset...which will contain the error") and proceeds to run with his "proof by assertion." The danger here is that users of error listings flagged by his method would rapidly acquire the habit of checking *only* the flagged entries — if the method flags only one entry, users might start changing that entry without checking further.

Such habits would occasionally produce confusion when the method selects *no* entries or only correct entries. They would also sometimes cause correct entries to be erroneously altered.

In Figure 1, two adjacent-digit transpositions in the same column position masquerade to Kraus' method as one errur. A hasty (ill-advised?) correction process might yield 26.34 — producing a balanced batch proof by falsifying the only correctly transcribed number in the group.

In Figure 2, a digit substitution error (a 0 became a 9) masquerades as an adjacent-digit transposition error. I suspect that this particular misreading of digits may be relatively common among substitution errors.

In Figure 3, a lost zero masquerades as an adjacent-digit transposition and, in Figure 4, a transposition in a negative entry is misinterpreted by the methud.

Kraus' example very nicely supports his method; just as my counterexamples support my objections. We need to remember, however, that real-life batches usually contain 20 to 50 transactions rather than two to five.

This has two implications: the chance of multiple errors in a batch is not so small that we can afford to risk deceiving ourselves (which the method will do — see Figure 1) if multiple errors happen; and the chance is quite good that Kraus' method will be able to find some "usual suspects" to latch onto in one of these "masquerade" situations.

When the sample Cobol code regards an entire transaction file as a single batch, these two dangers approach certainty.

(Continued on In Depth/2)

ORIGINAL DATA	INPUT DATA	FLAGGED	ACTUALLY WRONG
35.70	37.50		*****
23.64	23.64	*****	
66.15	61.65		*****
125.49	122.79	-270/9=-30	

Figure 1

61.06	61.96		*****
66.55	66.55	*****	
127.61	128.51	90/9=10	

Figure 2

300.35	30.35		*****
476.53	476.53	*****	
776.88	506.88	-27000/9 = -3000	

Figure 3

26.92 CR	29.62 CR		*****
162.57	162.57	*****	
135.65	132.95	-270/9 = -30	

Figure 4

TRANSPOSITION ERRORS: A REBUTTAL

(Continued from In Depth/1)

There are several other flavors of transcription errors:

- Nonadjacent single-digit transposition.
- Multiple-digit transposition.
- Substitution (a wrong digit).
- Insertion/deletion.

Surprisingly, a little bit of study reveals that these other kinds of errors also leave "footprints" in the out-of-proof amount.

Any rearrangement of the digits of a number yields another number which differs from the original number by some multiple of 9. A single adjacent-digit transposition error produces an out-of-proof amount which, when divided by 9, yields a quotient that contains only one nonzero digit (as Kraus correctly showed, the position and value of this digit and the sign of the quotient are all informative).

A single transposition of nonadjacent digits (e.g., 4,096 to 4,690) produces an out-of-proof amount that, divided by 9, yields a quotient whose nonzero digits are alike and adjacent (e.g., 40965 to 46905 gives out-of-proof 5940; dividing by 9 yields 660). The number and position of the nonzero digits in the quotient indicates the positions of the two transposed digits in the original number, while the (signed) repeated digit in the quotient equals the difference between the transposed digits.

We can thus tentatively identify single-digit transpositions, adjacent or nonadjacent, by the following procedure:

(1) Divide the out-of-proof amount by 9.

(2) If (1) yields a zero remainder, divide the quotient repeatedly by 10 until it yields a nonzero remainder, then back off and remember the number of successful (remainder=0) divisions performed.

(3) Take the quotient of the last successful divide-by-10 and attempt to divide it by 1, 11, 111, 1111, 11111 and so on until one of these divisions yields a zero remainder and a quotient whose absolute value is less than 10. Stop trying if you produce a zero quotient.

(4) If one of the (3) divisions succeeds, then:

- The number of successful divides-by-10 in (2) shows where the right-hand transposed digit is with respect to the right-hand digit position of the entire number.
- The number of 1s in the successful (3) divisor shows the distance between the transposed digit positions.
- The signed quotient, added/subtracted (depending on the sign of the entry) to the right-hand transposed digit, yields the left-hand transposed digit.

(5) If the (3) divisions all fail, then we face something other than just one single-digit transposition error.

(6) If the (1) division fails, we have at least one nontransposition error.

An Example

Take a look at Figure 5, in which 3941512 is mistranscribed to 3141592. We find dividing the out-of-proof amount by 9 yields-88880 with zero remainder, so we suspect a transposition.

Dividing by 10 succeeds once, leaving-8888. Dividing by 1 fails (the quotient is much greater than 10); dividing by 11 and 111 also fails.

3141592
-3941512

-799920

Figure 5

However, dividing by 1111 succeeds (quotient= -8, remainder=0), so we conclude that if one single-digit transposition is the only cause of the out-of-proof amount, then:

(Continued on In Depth/7)

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	400 x 400†	2555 secs	3774 [illegible]	[illegible]
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	linker	Yes	[illegible]	[illegible]
	assembler	[illegible]	[illegible]	[illegible]
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TRANSPOSITION ERRORS: A REBUTTAL

(Continued from In Depth/2)

- The right-hand transposed digit is in the second-from-the-right digit position of the number (because the divide-by-10 succeeded once).
- The left-hand transposed digit must be four positions leftward (because the successful ls divisor contained four ls.
- The left-hand transposed digit must be 8 smaller (in a positive entry) or 8 larger (in a negative entry) than the right-hand transposed digit (because the quotient from the successful ls divide was -8).

The reader may verify these assertions against the fabricated test case.

Substitution Errors

A single-digit substitution error will produce an out-of-proof amount which contains exactly one nonzero digit. An EXAMINE (or, for advanced practitioners, an INSPECT) on the digits of the out-of-proof amount can detect this (number of zeroes + 1 = field width).

Alternately, divide repeatedly by 10 until the remainder is not zero. If the quotient is then zero, the condition holds.

Some digit substitutions are more probable than others because of visual similarities (0 vs. 9, 3 vs. 8, 1 vs. 7), so it is quite possible that the sign and single digit of the out-of-proof amount can select a small subset of entries for special examination. For example, if the out-of-proof amount is -50 and one of the entries is +335, it should be highlighted for early scrutiny as a possible substitution/mistranscription of 385.

(Similar digits on either side of the suspect digit, as here, increase the likelihood of a substitution error — or so thinks an amateur linguist-psychologist).

Note that if the single nonzero digit in the out-of-proof amount is a 9, we have ambiguity between the substitution test and the transposition test, as exemplified in Figure 2. For another example, an out-of-proof of -90 in a list of numbers which includes 4005 and 2345 might mean either that 4005 should be 4095 or that 2345 should be 2435 (or that both entries are correct and the error is elsewhere in the batch!).

Insertion/Deletion Errors

Digit loss (e.g., 23745 becomes 2345) also leaves a distinctive but ambiguous footprint in the out-of-proof value. If y is the lost digit, and x is the number to the left of the lost digit, the out-of-proof amount will have the form:

$$10^{N} X (x - (10x+y)) = 10^{N} X (-9x-y)$$

This suggests we should divide the out-of-proof amount by 9 (after dividing off trailing zeroes), then search for an entry which begins with the same series of digits as the quotient.

For example, in Figure 6, 23745 is mistranscribed as 2345. The result of the equation implies that some entry 23XX should be 237XX.

$$\begin{array}{r} 2345 \\ \underline{-23745} \end{array}$$

$$-21400 / 9 = 23 \text{ R } 7$$

Figure 6

Digit insertion uses the same calculation, but works the opposite way. In

(Continued on In Depth/13)

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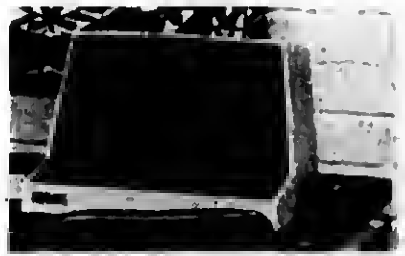

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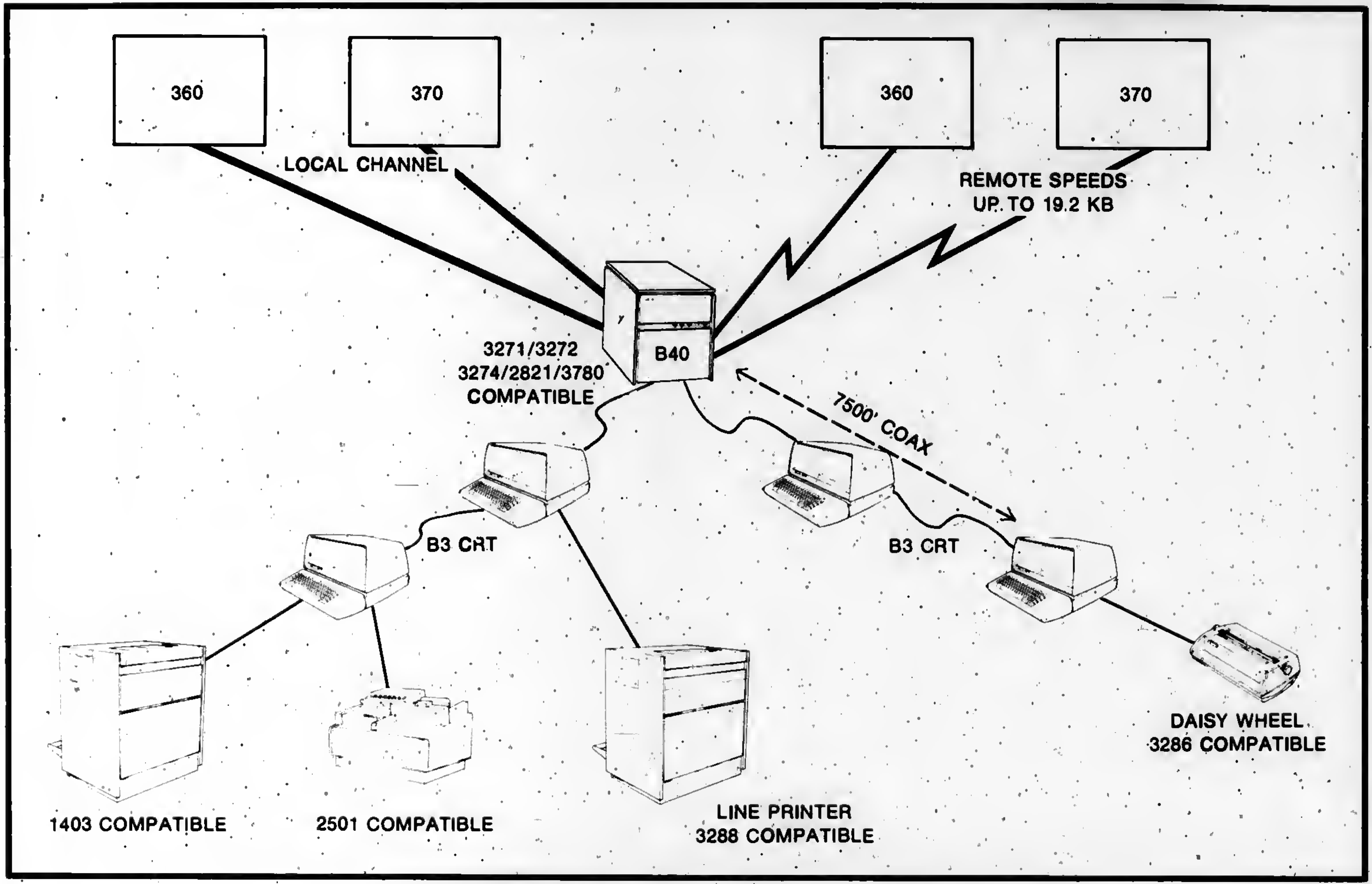
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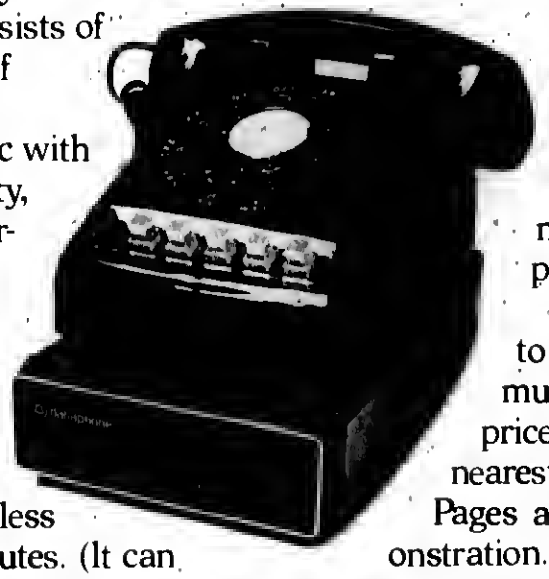

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(Continued from In Depth/7)

Figure 7, 2345 becomes 23345. The result of the equation implies that some entry 23ZXX should be 23XX.

If the last digit of the quotient equals the remainder or, if the remainder equals the first X digit of a particular entry, the probability of lost/added digits is greater because doubled digits are a more than random opportunity for insertion/deletion.

Several Flags

All of these methods become more blurred if positive and negative entries are intermixed within a single batch. For this and many other reasons, it is desirable (when feasible) to design away from mixed-sign batches.

Alternately, positive and negative entries could/should be *separately* control-totaled within each batch:

What emerges from this mixed bag of candidate methods to catch errors is a batch transaction listing with several "candidate flag" columns, plus a loud warning that flags identify error candidates, *not* definite errors. Always check source documents.

What also emerges is an imperative need to aodit the method in operation.

Cobol Code Errors

There were several errors and implementation-dependent constructs in Kraus' Cobol code. The following list is incomplete:

- As noted above, *any* rearrangement of the digits in a number will yield an out-of-proof amount which is exactly divisible by 9. The code completely fails to verify that the quotient of the 9 division contains only one nonzero digit (the necessary, but not sufficient, condition for a single adjacent-digit transposition error), but rather assumes it.

Take a look at Figure 8, which assumes that 6275 became 6572 in transcription. The code will convince itself that it is looking for two adjacent digits in the second and third positions from the right, with the left digit three larger than the right digit, and will zing right past this erroneous item (and flag some innocent, correct item?).

- The text carefully stated that "digit positions will be counted from right to left." The code, however, carefully counts from left to right, completely invalidating itself.
- The text also carefully stated that "decimal points will be ignored," yet the crucial "divisible by 9?" text in the code divides an integer into a number with decimal places to yield integral quotient and remainder fields. Many implementations of Cobol will *not* carry the division into the fractional portion of the dividend with this combination of PICTUREs.

In any case, a remainder field that is not as precise as the dividend will destroy the validity of the division and cause all kinds of misrecognition problems.

- REMOVE-DETAIL-SIGN seems an odd name for a field whose PICTURE *does* contain the "S" sign character.

```
 23345
 -2345
 _____

 21000 / 9 = 2 R 3
```

Figure 7

```
 6572
-6275
_____

  297 / 9 = 33 R O
```

Figure 8

Moderately careful scrutiny of the Cobol code thus identified at least three errors — each of which is sufficient to completely destroy the effectiveness of the routine.

Robert B. Higgins is currently the internal financial time-sharing consultant for the Industrial Chemical Group of FMC Corp. in Philadelphia.

He has been involved with commercial DP and Cobol for 14 years, having worked with the U.S. Army, hardware and software vendors, a university and a major New York City bank before assuming his present position.

Higgins, who has earned a bachelor of arts degree, also holds the Certificate in Data Processing.

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See "Data Communications Networks" in our November 27th issue.

Time was, the data communications user had a limited choice between using the public switched telephone network, or leasing private lines. But recent data communications developments are rapidly allowing the user to configure more flexible networks, with greatly increased transmission efficiency, and easy interfacing of terminals and computers to the network.

Computerworld's November 27th Special Report takes a close look at data communications networks, and how they are rapidly making distributed processing technically feasible (as well as affordable). Edited by Ron Frank, *Data Communications Networks* will examine standards for evaluating and establishing effective networks, with articles by vendors and users on design, control and maintenance of the various available networks. We'll also be talking about:

- *Terminal selection — getting the most work out of the right terminal.*
- *Private line vs. public data networks — how users can best utilize either [or both] systems.*
- *Switched networks — choosing between circuit switching, message switching, and packet switching.*
- *Configuring in the '80's — microwave transmission and satellite links.*

Whether you're presently involved with data communications, or just looking, our November 28th Special Report will be of special interest to you. And if you market data communications products or services — this is a good place to get the word out. Ad closing date is November 10, and your *Computerworld* representative can give you all the details. Or, to reserve space, call Terry Williams at (617) 965-5800.

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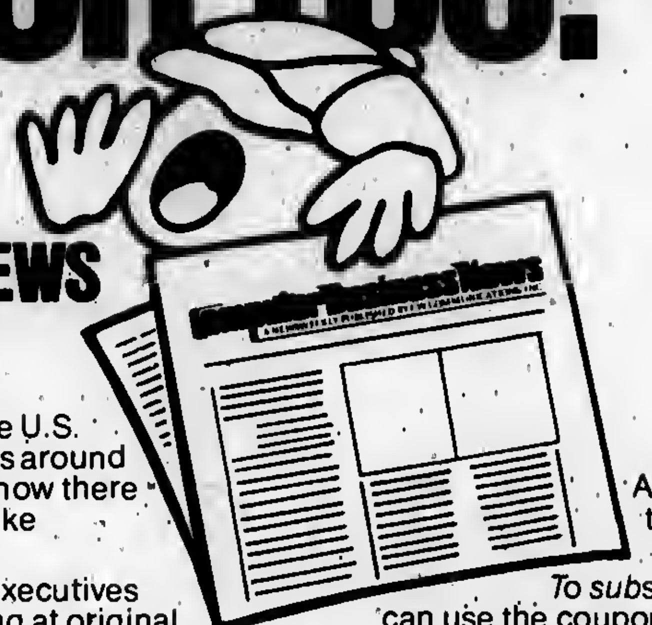

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For Manufacturers, Distributors

System/38 Offers Application Programs

ATLANTA — Although advances in semiconductor technology and operating system architecture highlight IBM's recently announced System/38 (CW, Oct. 30), the high-end small business system also offers two sets of applications software totaling 16 packages.

One set consists of five individually installable modules that reportedly allow distributors to interactively perform applications that traditionally have been done in batch mode. The other set includes 11 manufacturer-oriented packages that perform applications like material requirements planning (MRP) and the standard accounting functions.

Specifically, the System/38 distribution management system software includes packages for payroll, accounts payable and general ledger plus an on-line applications generation aid called the Display Information Facility (DIF). The other distributor module is an Inventory Management, Product Replenishment and Order Validity Evaluation (Improve) package.

The manufacturers' software, meanwhile, consists of applications packages for order entry and invoicing, accounts receivable, inventory management, sales analysis, general ledger, accounts payable, payroll, product data management, MRP, production control and costing, and data collection system support. Together, these 11 modules are called the System/38 Manufacturing Accounting and Production Information Control System (Mapics).

Using Improve, the System/38 can help users forecast inventory demand by extrapolating from previous records, according to an IBM spokesman. The package also helps users estimate the optimum lead time they should allow for ordering inventory replacements, and it aids selection of the lowest priced items. Priced at $150/mo, Improve becomes available in July 1980.

Payroll Package

The payroll package produces weekly, biweekly, semiweekly and monthly payroll checks as well as calculating gross-to-net pay for hourly and salaried employees and monitoring pay rates, shift differentials, taxes, voluntary deductions and exceptions. Available for a $50/mo license fee, the package is also said

(Continued on Page 62)

Users Urged to Centralize Plans When Distributing Mini Systems

By Howard A. Karten
CW Staff

CHICAGO — The control of DP activities in companies with geographically dispersed divisions, or divisions engaged in unrelated activities, can be accomplished with minicomputers in each division, but the planning for these DP activities must be centralized if they are to be successful, speakers agreed at a panel on "Managing the Proliferation of Minicomputers" at a recent conference here.

Richard C. Williams, manager of systems design and planning for Continental Forest Industries, Inc., explained that his company has dealt with the twin problems of controlling DP activities and applying minicomputers to business needs by providing centralized planning and decentralized implementation of DP activities.

Defining roles as "planning" or "implementation" is important, Williams said, because the equipment selection process calls on a central pool of expertise while relying on those most familiar with the individual wrinkles of a business to solve their own problems.

Two factors in particular have prompted his company to take this approach, the manager said. The first is that the company has 60 business locations, producing eight major product lines; the second stems from the fact that talking about economies of scale might no longer be valid for mainframes and minis.

Describing his company's DP gear as "a virtual zoo, with Burroughs, IBM and other vendors' equipment," Williams said his company's divisions employ 46 DP persons, half of whom are engaged in nonanalysis activities, such as operations and data entry. "Many of them got their experience on tab equipment," he added — a background that encouraged approaches better suited to tab equipment than to modern DP concepts. In addition, local division or plant managers have a tendency to buy hardware ill-suited to its intended task.

Decentralization Wins Convert

Sharing the podium with Williams was H. George Connell, who described the situation that existed when he joined Bangor Punta Corp. of Greenwich, Conn., several years ago as director of information systems.

Stating that "Most senior managers [of the company's divisions were] largely out of touch with the DP function," Connell said he worked closely with them to provide education and evolve individual systems plans.

Describing himself as a "convert from the idea of centralization of DP," Connell told how circumstances similar to those at Continental Forest Industries helped him choose decentralization.

Williams noted that his company, with a yearly systems budget of $3.6 million and a telecom-

(Continued on Page 58)

Firm Speeds Deliveries Of DEC Replacement Parts

SAN FRANCISCO — Users of any Digital Equipment Corp. computer system can reportedly receive spare parts for their equipment faster and less expensively from an independent service firm here than from DEC or its authorized dealers.

World Data Corp. (WDC) typically requires only a week to 10 days to ship DEC replacement parts to users anywhere in the U.S., according to the company's president and sole full-time employee, Marvin Bennett.

WDC's shipment lead time thus represents a 14-day improvement over DEC's parts delivery schedule, Bennett said.

Moveover, the independent service company offers users a 5% to 10% greater discount for spare parts than DEC, whose own discounts typically range from 8% to 25%, he added.

Although WDC's service is said to cover DEC's complete computer systems line, the firm specializes in parts for the PDP-8 and PDP-11 series. The company's parts inventory for those two families contain all the items listed in DEC's part catalog, including cables, logic chips, supplies and documentation.

WDC also supplies "spares kits," which, depending on their size, range in cost from $200 to $20,000 and provide enough parts for up to a year's operation. A spares kit's contents typically include items like reset buttons, switches, memory boards and logic chips, Bennett said.

All WDC-supplied parts are warranted for 90 days from time of shipment. The company requires a minimum purchase of $250 and is located at Suite 277, 519 Castro St., San Francisco, Calif. 94114.

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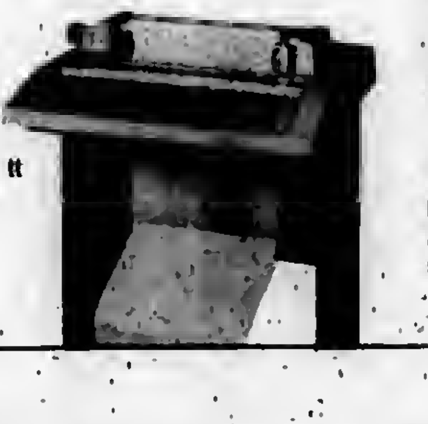

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Winchesters Get Backup

SAN DIEGO — Users can reportedly provide backup for their Winchester-type disk units as well as meet their business systems storage needs with a 6,400 bit/in. cartridge drive unit from Tandberg Data, Inc.

With a cartridge containing 300 feet of tape, the TDC 3164 provides backup for a 10M-byte Winchester disk unit; with a cartridge containing 450 feet of tape, the product backs up a 20M-byte disk unit. In either case, the storage system transfers 192k bit/sec.

Three hardware modules comprise the tape drive unit: a TDC 3100 drive mechanism 6,400 bit/in. four-track head, and single-board electronics assembly.

First shipments of the $1,750 tape unit begin in January from 4060 Morena Blvd., San Diego, Calif. 92117.

Users Urged to Centralize Plans

(Continued from Page 57)

munications budget of $3 million, obtains minis "scaled to the size of our business units." This approach provides ease of use, which means a legion of support people — such as tape handlers and forms handlers — are not needed in an installation.

The centralized activities provided by both companies include consulting with local users, planning and review, prompting local users to action and formulating strategies.

In contrast, activities at a local level include detailed planning, implementation and collating of system requirements. Establishing charters for these activities can be difficult, Williams noted.

Controlling DP Activities

Williams outlined the method by which DP activities are controlled under his company's system. These activities include extensive user contact, formal approval by headquarters, concurrence review and formal and informal project monitoring. Nonfinancial management objectives, in which division managers produce annual systems plans, are also used.

Included in these activities are a formal written plan submitted by local users, with project milestones and a review of activities, Williams explained.

This method is not without its flaws, the speaker conceded. First of all, the people doing the implementation are "the salt of the earth," Williams said, "but in some cases they don't know much about DP."

Moreover, "there is some noncooperation" because the cost of the DP equipment is often small compared with the remainder of the division's budget. "In a $60 million operation, DP equipment may only account for .4% of the budget," Williams said. There is a tendency for managers to overlook or not be concerned with this time.

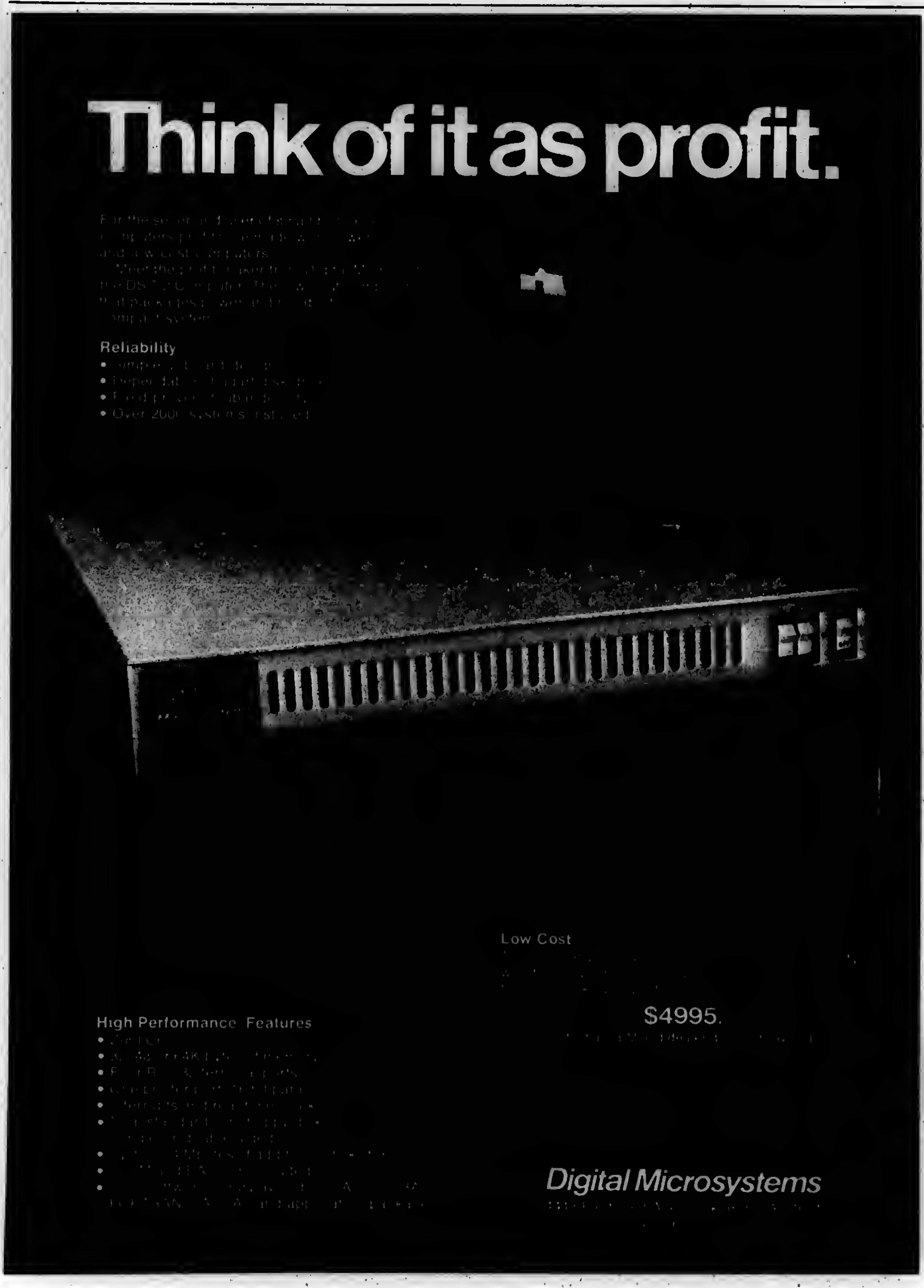
Salaries and Salesmen

Adding to the hitches mentioned by Williams, Connell said, were two he had encountered: salary problem and difficulties with overenthusiastic salesmen.

Addressing the issue of salaries, Connell noted the difficulty of finding competent people. To make matters worse, the competition is stiff for the few qualified people who do exist. As a result, Connell cannot easily find and hire programmers at attractive salary levels "without rupturing the whole salary structure" of a division.

Vendor problems fall into two categories, Connell added. First, despite the policy of centralized purchasing decisions, systems "were often acquired by 'the back door'" from fast-talking salesmen and often not used to best advantage.

Additionally, the rapid expansion of many minicomputer manufacturers has resulted in salesmen who know hardware, but not applications. Unlike the larger mainframe vendors, minicomputer vendors do not provide good advice, Connell asserted.



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Mini May Help Grad School Attract Students

By Marguerite Zientara
CW Staff

RICHARDSON, Texas — Striving to bolster its sagging enrollment, the Graduate Social Sciences School of the University of Texas (Dallas) acquired a multiuser minicomputer system 10 months ago to analyze statistics, perform selected administrative functions and help students do their homework.

Whether the system will induce additional students to study here as school administrators hope remains to be seen. One fact, however, has already clearly emerged: the system "has made this institution one of the most sophisticated social science data analysis schools in the country," according to David J. Morgan, director of the university's Data Analysis Laboratory.

The Social Sciences School became the first user of Wang Laboratories, Inc., 2200MVP multiuser system last December after searching two years for hardware to meet the institution's DP needs.

The school previously used the university's IBM 370/155 and Digital Equipment Corp. PDP-11/45 but experienced unacceptable lead times with that equipment.

"We couldn't get quick enough turnaround time for interactive use."

"Since the students were doing simple statistics problems, we didn't want to wait an hour for a batch turnaround job averaging six or seven numbers."

The school also felt that purchasing its own computer would "establish a sense of professionalism and individuality that all 500 of our students could share," he added.

Limited Search

The institution limited its search for replacement hardware to multiuser systems with extremely fast processing speed, the ability to enter jobs remotely into the 370, the capacity to accommodate at least eight terminals and, most important, ease of use, Morgan said.

School officials also strove to spend less than the $60,000 in grants the school received from the state in 1975.

In searching for a system, the school considered several Hewlett-Packard Co. systems, Basic/Four Corp. equipment, the Data General Corp. Nova line of minicomputers and DEC's PDP-11/45 and 11/34, in addition to the Wang machine.

Because the DEC and the Wang equipment all could expand to eight terminals, Morgan and his associates benchmarked the systems by comparing their ability to invert matrices, a function often performed in statistical applications, Morgan said.

The Wang MVP system inverts a 30-by-30 random matrix in nine seconds for a machine cost of about $25,000, while the other systems took 35- to 61 seconds and cost $30,000 to $40,000, Morgan said.

Morgan wanted to use Basic because the machine would be used for education and found that Basic was executed faster in the hardwired Wang equipment than in DEC's software.

Another deciding factor was DEC's requirement of maintenance payments for its interpreter, while Wang supplied updates free, according to Morgan.

The School of Social Sciences' Wang 2200MVP system incorporates a multipartitionable CPU, four 2236D terminals and one 240 line/min printer. It also uses a 10M-byte disk unit, one IBM-compatible flexible diskette unit and a 2227B telecommunications I/O board, he noted.

The system has been running smoothly since late January, Morgan said, but in the previous month several changes had to be made. Since the school has Serial No. 1 of the Wang line, Morgan explained, some of the software hadn't been converted to run in a multiuser environment.

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PALO ALTO, Calif. — Two enhancements to the Hewlett-Packard Co. 7970E tape unit — an interface/-controller and a modified cabinet — are said to ease connection of the mass storage system to HP computers.

Compatible with HP's IEEE 488-1975 standard interface bus, the interface/controller fits within the tape unit rather than within a host CPU. As a result, it requires only one cable to connect to a host system.

The microprocessor-based controller reportedly accommodates up to four tape drives and provides each with on-board intelligence.

A 7970E with the interface/controller and cabinet forms a 7970E Option 426 subsystem, which costs $12,000. HP is located at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Starting Nov. 30

Series of Reports Will Provide User Ratings of Small Systems

CHICAGO — The first in a series of small systems user satisfaction reports will be available Nov. 30 from the Customer Satisfaction Research (CSR) Institute.

Until now the institute specialized in research oriented to vendor's needs. However, with the six separate reports slated to appear later this month, it hopes to become the consumer guide for the DP industry, according to Joanne Ewertz, director of Computer Central Services Division at CSR Institute.

The reports, Ewertz said, will be particularly useful for "the first-time computer user or for the user who made a mistake the first time around and doesn't want to make a second mistake."

Samples of the final reports were not distributed at the Information Management Exposition & Conference (Info' 78) held here recently. But Ewertz explained the first group of reports will include user satisfaction ratings of small business systems manufactured by Burroughs Corp., Digital Equipment Corp., IBM and NCR Corp. and of dedicated minicomputers from Data General Corp. and DEC.

User Satisfaction Ratings

Priced at $35 apiece, each report rates — on a scale of one to five — user satisfaction with various aspects of one vendor's system or equipment. The factors rated by users include price, hardware reliability and throughput, software support, sales. representative support and installation.

Using a weighted average, CSR Institute computes a user rating for each of the factors for each company and calculates an average and a range of scores for 10 manufacturing companies combined.

"Each company is user-rated to the industry at large, but companies are never directly compared," Ewertz said. "CSR Institute does not make recommendations of specific products. Rather, we let users make their own comparisons."

Recent Product Offerings

The user satisfaction series focuses on recent product offerings or the most popular models of the vendors selected for ratings. Moreover, the systems or individual minicomputer must have been installed at the user's site at least 90 days prior to the evaluation interview. Users are interviewed by telephone.

After the institute decided to offer the service to users, Ewertz said she interviewed users and nonusers alike to discover what kind of information they would like to see included in the reports.

CSR Institute's Computer Central Services Division is located at Leawood Manor, 4901 College Blvd., Shawnee Mission, Kan. 66211.

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Serial Impact Printer Outputs 55 Char./Sec

LEXINGTON, Mass. — Plug compatible with Qume Corp.'s character printers, a serial impact printer from NEC Information Systems, Inc. reportedly incorporates a "thimble" output mechanism that holds up to 128 alphanumeric characters.

By contrast, the Qume units, which are replaced by the Model 5500Q Spinwriter, provide a daisy-wheel printing mechanism.

Rated at 55 char./sec, the microprocessor-based printer comes in two versions: one with 10 char./in. output and the other with 12 char./in. output, each with proportional spacing. In its 10 char./in. version, the unit produces 136-column lines; in its 12 char./in. version, 163-column lines.

Regardless of the line width, the Model 5500Q emits 67 dBs with its cover removed and 60 dBs with its die-cast aluminum cover installed. In addition to producing subscripts and superscripts, both versions provide 1/120 in. horizontal positioning resolution and 1/48 in. vertical positioning resolution.

For end users, the printer costs $2,169; for OEMs, $1,140 in lots of 100. NEC Information Systems is located at 5 Militia Drive, Lexington, Mass. 02173.

System/38 Offers Packages

(Continued from Page 57)

to provide on-line editing, search files and one-time information entry.

With the accounts payable package, users can produce management reports and select open times for payment, the source noted. Other functions include check writing and reconciliation, invoice distribution and invoice payment selection. The package is available for a $40/mo license fee.

General ledger software, meanwhile, produces year-to-date income statements and balance sheets and compares current financial reports with previous records. Using a double-entry bookkeeping system, the package leases for $40/mo and, like the payroll and accounts payable programs, will become available in May 1980, the spokesman said.

The DIF package helps develop programs that aid on-line access to data files and permits creation of custom-written programs by combining searches, inquiries and lists with functions unique to a user, the source added. When it becomes available in May 1980, the DIF will cost $50/mo.

Mapics Software

Shifting his attention to the Mapics software, the IBM spokesman credited the order entry and invoicing package with verifying credit and providing access to information like blanket order status. The package is also said to help prepare invoices, shipping labels, packing lists and bills of lading. Users can acquire the programs for a $60/mo license fee.

The accounts receivable package, which leases for $40/mo, records customer charges, cash payments, credit and debit memos and other adjusting entries, the spokesman explained.

With Mapics' inventory management package, users can reportedly update inventory balances as they enter transactions and can calculate on-hand, on-order and allocated quantities based on issues, receipts and shop-order releases. The package leases for $51/mo.

For a $50/mo license fee, the sales analysis module helps identify buying trends by tracking sales performance by product or salesman, the spokesman added.

The Mapics general ledger program, meanwhile, provides periodic or on-demand financial reports and leases for $40/mo. With the package, users can reportedly organize general ledger data by department with comparative income statements or tailor it to management's chart of accounts.

Accounts Payable

Mapics' accounts payable package records vendor invoices and credit memos and leases for $40/mo. With the module's on-line inquiry capability, users can display open payables information about vendors.

Using the Mapics payroll program, users can also calculate wages, taxes, deductions and net pay as well as print checks and update files for various classes of pay plans, the IBM source said. The payroll software is available for a $50/mo license fee.

The product data management package maintains bills of material, manufacturing routes and information about each of a user's work centers. Available for a $90/mo license fee, the product also keeps engineering and cost records, the spokesman added.

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This reduction in host overhead is accomplished by employing a flexible polling algorithym in the CMC whereby several of the parameters are user selectable on a per line basis.

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By Ann Dooley
CW Staff

DALLAS — A unique bilingual instruction system designed to help Spanish-speaking grade-schoolers here is being converted from minicomputers to microcomputers in an attempt to lower costs.

The Dallas Independent School District, which developed the computer-assisted instruction (CAI) program, is currently in the process of switching from a Digital Equipment Corp. PDP-11/34 time-sharing system to a microcomputer-based system using Radio Shack Corp. TRS-80s and Mits Altair microcomputers. The DEC PDP-11/34s were fine as far as they went, but they simply proved too costly to operate on a large scale, according to Bill Gattis, principal analyst for the Dallas School District.

The school district wants to expand the system around the city and there is no way that can be done using the minis, he noted. Currently cost per student-hour of use is around $2 to $2.50 and the district's goal is to lower that rate to 50 cents per student-hour. And the only way to do that is by using micros and finding a lower cost voice synthesizer, he said.

Two-Pronged Program

The program, which is in its second year of operation, is comprised of a math program and a Spanish/English reading and language comprehension program. The Spanish/-English program is now in use at only one school, the Gabe Allen Elementary School, whose students are nearly 100% Spanish speaking and between the ages of six and eight.

The system was programmed to store a student file for each child with his name, both in print and in text, for the voice synthesizer so the system speaks to each child by name. The student file also includes a student number, a personal message for the day and the lesson the student is working on or is about to begin.

A first grade student begins learning with the system by identifying the letters of the alphabet In Spanish. The system teaches the child in Spanish while he is learning English in class and then starts using English once the child has mastered the language sufficiently.

Three Spanish-Speaking Grade-Schoolers Using Bilinqual Computer-Assisted Instruction Program.

Supplement to Teacher

The system is intended to supplement the teacher's efforts. There is a shortage of bilingual teachers, and this system can keep the child at a learning level in Spanish equal with other students until he or she has sufficiently grasped English, Gattis said.

The conversion occurs when both the system and the teacher determine it is appropriate. Because the system is self-paced and individualized, children lose their fear of competing with other children in a strange language, he noted.

(Continued on Page 66)

Word Processing Software, Z80 Assembler Introduced

NORTHRIDGE, Calif. — A reentrant word processing package that provides multiuser capabilities and a Z80 macro assembler that can also run on 8080 systems have been introduced by MVT Microcomputer Systems, Inc.

The MVT-Wordflow package uses S-100 bus equipment and the Famos multitasking disk operating system. The package lets four or more users simultaneously use the reentrant editor and output programs and lets the micro provide computational support even while multiple report or letter editing jobs are in process.

Among other features, the text editor program reportedly includes search/replace commands; scroll and position control; character, word, line or page insertion or deletion; and block transfers.

The Z80 assembler supports nested macro calls and nested macro definitions, with up to 10 parameters, the firm said.

The programmer may select from various listing options and formats including a complete cross-reference table where options and formats may even be specified dynamically in the source program. The assembler and linkage editor support up to 450 global symbols, the company said.

The MVT-Wordflow costs $400 and the A80 macro assembler $375 from MVT Microcomputer Systems, Inc., Suite 203, 9241 Reseda Blvd., Northridge, Calif. 91324.

Micro Chips

Branch of Computerland Now Open in Honolulu

SAN LEANDRO, Calif. — Computerland Corp. has opened its 50th store in the 50th state.

The new store is located at Kawaiahao Plaza, 567 S. King St., Honolulu, Hawaii, and is owned and operated by Bob and Pat Moore.

The firm said it plans to have some 70 stores in operation by the end of this year.

Computerland Corp. is located at 14400 Cataline St., San Leandro, Calif. 94577.

Novices Given Reference Aid

DEDHAM, Mass. — *The Computer Book* from Artech House is intended as a reference guide for the novice computer user or the professional, the publisher said.

Designed in a workbook format, the publication includes information on number systems and codes, memories, peripherals, programming, languages and microcomputers.

The book costs $28 from Artech's Computer Department, 610 Washington St., Dedham, Mass. 02026.

Parisian Show Set for May

PARIS — Micro/Expo '79 will be held here May 15-17 at the Centre International de Paris. The show, which is in its fourth year, has doubled in size and attendance every year — an indication of the growth in the European personal computing market, according to the show's sponsor, Sybex, Inc.

The conference will be held in English and French and will focus on new products, industrial applications and personal computing.

For additional information, contact Sybex, Inc., 2020 Milvia St., Berkeley, Calif. 94704.

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Disk Operating System Supports 6800-Based Units

SAN DIEGO, Calif. — Electronic Product Associates, Inc. has introduced a disk operating system for Motorola, Inc. 6800 microprocessors with at least 24K of random-access memory (RAM) and a floppy or other kind of disk drive.

SDOS can support 64K of RAM and any number of compatible disk drives on-line and will reportedly support files on any storage device capable of holding up to 2.15 billion bytes. SDOS supports both random and sequential disk files, device-independent I/O, a user-customizable command interpreter and tailoring of the disk drives and can be adapted to most disk hardware, the firm said.

New disk files can be created automatically and SDOS performs space management dynamically so files can grow or shrink as desired, according to the firm.

The assembly language interface to SDOS is the same as the Software Dynamics, Inc. (SD) I/O package interface, so all available SD software can be run under SDOS with change, the firm said. The Command interpreter allows the user to invoke any program, including Basic programs compiled by SD Basic, by simply typing its name, the firm added.

SDOS costs $250 from Electronic Product Associates, Inc., 1157 Vega St., San Diego, Calif. 92110.

Physicians' Research Aided

OSLO, Norway — A data system designed for physicians who wish to conduct independent research and statistical projects has been unveiled by A/S Mycron.

The Mycron SDS system fits on a desk and allows doctors to record both general and medical data collected during patient consultations and treatments as well as other statistical data.

Using a Tandberg Radio Fabrik's A/S-type TDV 2115 computer designed at the University of Tromso, Norway, the system can be modified to meet specific requirements.

The Mycron SDS costs $12,000 without a CRT and is available from A/S Mycron, P.O. Box 6199 Etterstad, Oslo 6, Norway.

Book Rates Minis, Micros

SAN JOSE, Calif. — SBS Publishing Co: has released *The Kips Book — Mini/Microcomputer Performance Evaluations*, that compares the performance of 35 leading minis and micros in situations where either could be employed:

The products are analyzed as to various criteria associated with particular applications. Along with the criteria checklist are tables on character analysis, task analysis and business and operational analysis. These tables combine technical, operational and business factors to form a cohesive evaluation process, according to the publisher.

Performance evaluations were conducted for the major product offerings from Digital Equipment Corp., IBM, National Semiconductor Corp., Data General Corp. and many other companies.

Five sets of instructions and products were compared to determine performance in science, business and utility areas, the publisher said.

The 160-page report costs $995 from SBS Publishing, Suite 190, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

Digital Group Users Gain CP/M Version

PEORIA, Ill. — General Technics, Inc. is offering a version of the Digital Research CP/M floppy disk operating system configured for Digital Group, Inc. microcomputers.

Digital Group users can now use CP/M to exchange programs with users of other systems as well as use the software that runs under CP/M, including Basic, Fortran IV, Cobol and several business packages, the firm said.

This implementation of CP/M is compatible with other CP/M systems and runs on any standard Digital Group 8080 or Z80 system having a minimum of 18K contiguous memory and one full-size floppy disk drive, according to the company. The system can accommodate up to four disk drives, the firm said.

The CP/M test editor, 8080 assembler, debugging tool, peripheral interchange program, relocator and utilities are included. The package comes with diskette, bootstrap read-only memory, CP/M manuals and documentation for $100 from General Technics, Inc., 1515 W. Main, Peoria, Ill. 61606.

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United States	36,100	45.3%	1
Japan	8,331	10.0	2
W. Germany	6,527	7.9	3
United Kingdom	4,794	5.8	4
France	4,768	5.8	5
Canada	2,301	2.8	7
Italy	2,119	2.6	8
Australasia	2,044	2.5	9
Brazil	532	.8	17
Middle East	328	.4	22

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School Switching to Micros for Cost Savings

(Continued from Page 63)

Since the system is being used by very young children, the system also was programmed to be as personal as possible. In addition to saying "good morning" or "good afternoon" to the child by name, children's birth dates are keyed in and the voice synthesizer sings "Happy Birthday" to each child on his birthday.

The students use earphones to hear the voice synthesizer, which is the only one of its kind to speak both Spanish and English, Gattis said. Visual graphics accompany the oral lessons to facilitate learning, he added.

Called Rolar by its young students, the system emphasizes reading readings, consonants, vowels, blends, comprehension, vocabulary, spelling, rhyming and syllables.

The system was also programmed to provide mathematics instruction to children from kindergarten through eighth grade, Gattis said. This part of the program has already been implemented on the TRS-80 microcomputers and has begun in seven schools in the Dallas area.

The system helps students drill and practice basic math concepts such as addition, subtraction, multiplication and division. In addition, it is keyed to each grade level and cross-referenced to several of the major math textbooks.

Both the bilingual and the math programs have been received very favorably by both students and teachers. Students respond well to the individualized private instruction, and although the results have not been formally analyzed, teachers have reported great improvements in the students' scores throughout the school year.

The program, which was designed by the Dallas School District in conjunction with the Foundation for Quality Education, Inc. of Dallas, was written in Basic with support from the Author programming package. Much of the programming and interfaces had to be designed by Gattis since there was no prototype to follow. "In fact, we had to develop Spanish character read-only memory (ROM) for the Spanish text," he noted.

Memory Expander Holds 8K Prom, RAM

DERBY, Conn. — The MEB-1 memory expansion box now available from E&L Instruments, Inc. accommodates 8K of random-access memory (RAM) and 8K of programmable read-only memory (Prom) and provides users of the company's 8080A-based MMD-1 microcomputer system with facilities for high-level languages or software development.

The unit includes power supplies, decoding and interconnection facilities that permit interfacing with other E&L micro products or peripherals. Units may be combined to provide memory expansion up to 64K bytes.

The MEB is supplied with 2K of RAM installed. Additional RAM is available in 2K blocks. No Prom is supplied, but blank-type 2708 Prom for the MEB-1 is available in 1K blocks.

The MEB-1 costs $300 assembled or $230 in kit form from E&L Instruments, Inc., 61 First St., Derby, Conn. 06418.

MFE Adds I/O Board

SALEM, N.H. — A serial I/O board, Option 404SER, now available from MFE Corp. provides a universal interface for the firm's Model 450B digital cassette transport.

The I/O board can be used for all applications in which the user's interface or data stream is already in serial format, the firm said. The serial I/O option includes a dual speed control that allows programmed selection of read/write, search, rewind/fast forward, adjustable write oscillator and Biphase-level encoder/decoder circuitry.

For special micro and minicomputer applications, MFE offers the separate Universal Parallel I/O Option 414PAR. Both options plug into and become part of the MFE Model 450B.

The serial I/O interface costs $135 from MFE Corp., Keewaydin Drive, Salem, N.H. 03079.

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Brazil Takes Steps to Hatch Mini Industry

By Nancy French
CW Staff

RIO DE JANEIRO, Brazil — The Brazilian government has taken radical action to ensure the development of a domestic minicomputer industry here. The action involves two basic steps — setting a ceiling on all computer imports ($130 million this year) and selecting and authorizing a limited number of local concerns to begin manufacturing equipment.

The quota system protects the Brazilian firms so they can flourish and employ high-level Brazilian technicians, according to Ivan de Costa Marques, technical director of Digibras, the government holding company that works with firms formed with national capital. De Costa Marques is considered by some sources here to have been the architect of this plan.

The national policy has been evolving for the past six to 10 years and grew out of a realization that to establish independence in technological fields and to decrease this nation's dependence on more developed countries — particularly on minicomputers which are needed for military applications — a domestic industry must be established and protected.

Minicomputers, rather than large systems, were also chosen for several other reasons: less investment was required, the technology was easier to develop and the market for minicomputers was seen to be far greater than that for larger systems. For these reasons, the government decided to "reserve" the minicomputer market for "Brazilian free enterprise."

Critics of the plan see it as a big gamble, one that may leave Brazil without sufficient, effective computer power to meet the demands of this fast-growing economy.

Five companies have received approval to manufacture minis to date and approval will be given to as many others as

(Continued on Page 70)

Fairchild Joins Four Others

Firm Starts $30 Million Suit Against DG

By Marica Blumenthal
CW Staff

SAN FRANCISCO — With the filing of a $30 million suit against Data General Corp. here on Oct. 16, Fairchild Camera & Instrument Corp. became the fifth company to institute antitrust action against DG.

Other companies involved in antitrust litigation with DG include Digidyne Corp., Ampex Corp., SCI Systems, Inc. and Bytronix Corp. Some of these actions are countersuits made in response to suits filed by DG against those companies charging them with misappropriation of trade secrets.

While the five suits vary somewhat, most charged that DG, through restrictive software licensing arrangements, is unlawfully tying the marketing of its software and hardware.

Another charge common to most of the actions alleges that DG is making a deliberate effort to drive competitors that make DG-compatible Nova processors out of the market using charges of misappropriation of trade secrets.

Fairchild's Countersuit

Fairchild's countersuit seeks injunctive relief invalidating DG's software license agreements. At the heart of the suit, Fairchild contends that its 9440 Microflame microprocessor — which emulates DG's Nova 1200 — is based on Fairchild's proprietary Isoplanar Integrated Injection Logic technology, not DG-developed technology.

Fairchild argued in its suit that DG's suit was based on "the false contention that DG is entitled to claim as a trade secret the same material which it has widely published and . . . therefore it is virtually impossible for any competitor to manufacture a Nova-compatible processor without infringing on [DG's] trade secret claims."

Moreover, Fairchild charged that DG has "embarked on a program to sue Fairchild and every other competitor who attempts to market a Nova-compatible processor on the purported ground that the competitor unlawfully obtained and misappropriated DG's trade secrets in order to manufacture a competing processor."

DG's suits, Fairchild contended, were brought to harass and intimidate potential purchasers of Nova-compatible processors and to deter them from purchasing from DG's competitors. Aside from the anticompetitive activity, DG has attempted to impede technological development, Fairchild

(Continued on Page 72)

Memorex Projects Earnings To Help Bolster Stock Price

By Marcia Blumenthal
CW Staff

SANTA CLARA, Calif — Although Memorex Corp. rarely makes projections of future earnings, it did so recently in an attempt to bolster the price of its stock, which plunged after the company announced its third quarter financial results.

For the third quarter, Memorex said earnings of $9.9 million or $1.30 a share were "disappointing" when compared with last year's third-quarter earnings of $8.3 million or $1.26 a share.

Revenues for the quarter climbed to $152.6 million, a 34% increase from 1977's third quarter revenues of $114.1 million.

In a special statement made after the earnings were announced, Robert C. Wilson, chairman and president of Memorex, said, "The price of Memorex stock has fallen more rapidly than the market recently. Although our third quarter was solidly profitable and results were above those for the prior year, they were evidently below the expectations of investors. We believe that fourth quarter earnings will be in the range of $1.40 to $1.60 per share."

Analysts had pegged Memorex earnings in the $1.40 to $1.50 per share range for this quarter, a Wall Street observed noted.

In attempting to put the company's plum-

(Continued on Page 68)

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Memorex Projects Earnings to Bolster Stock

(Continued from Page 67)

meting stock price into perspective, a spokesman said the company had a strong second quarter followed by a relatively flat third quarter. This, compounded with a particularly depressed stock market during the Oct. 16 trading week, may have prompted investors who purchased Memorex stock at even lower prices earlier in the year to sell, realizing a gain in a dropping stock market, he continued.

In the past 12 months, the price of Memorex's stock has fluctuated between $24 a share and $60 a share. During the week of Oct. 16, the price of Memorex's stock on the New York Stock Exchange composite tape dropped from $49.125 to $36.25.

Commenting on the market reaction, two analysts concurred that the drop in the price of Memorex stock was not the result of any inherent weakness in its financial position, but rather, was fueled by expectations generated for the company's financial performance by Wall Street.

"What happened is totally outside of what is happening in the computer industry," one of the analysts observed. It may take Memorex stock months to recover from the effects of the recent market activity, he continued. "This happened to Burroughs Corp. a while back, and it happens, in a mild way, to Digital Equipment Corp. every so often."

Yet a third analyst said, "High technology stocks ran up rapidly this year, and as the market has weakened, profits were taken in those markets more rapidly than in others."

However, he did point out that many companies with product lines like Memorex's have reported better earnings results.

Disk Product Shipments

One possible problem, he theorized, may be with shipments of Memorex's IBM 3350-compatible disk products, a rapidly growing area for Memorex. Memorex has been gearing up to ship 150 to 200 of these systems a month, and being off by 30 or 40 units a month may affect earnings, he explained.

In addition, IBM reduced the purchase price of its 3350 disks by 20%, he noted.

On the whole, the analyst concluded, "If Memorex is going to earn more than $6 a share for its fiscal year, then the price of the stock should be higher than it is now."

For the year to date, Memorex's earnings were $37.8 million or $5.27 a share compared with earnings for the 1977 period of $40.6 million or $6.43 per share.

Revenues for the first nine months of 1978 were $450 million, a 38% increase from revenues of $326.1 million for the same period a year ago.

In commenting on third quarter results, Wilson said, "Although quarterly income before extraordinary credit was about the comparable 1977 quarter, it was disappointing in view of the higher revenue, the one-time benefit from the sale of the company's holding of Computer Communications, Inc. stock, a lower effective tax rate and reduced costs of the IBM litigation.

"Profit pressures included manufacturing cost variances, costs associated with new products and our rapid growth and decentralization of operations. The fourth quarter has traditionally been our best revenue quarter and profits should benefit accordingly."

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Lawyer Cites Unresolved Issues

Public Data Retrieval Viewed Benefit, Bother

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The prospect of a U.S. market for public data base retrieval systems, such as the Viewdata system being pilot tested in the UK, is a "good news-bad news" situation, according to one DP industry observer.

The good news is that the systems are available, they are exciting, there is a need for them and there is a market for them, according to John L. Bartlett of the Washington law firm Kirkland and Ellis. The bad news, he said, is that in the end, "the lawyers are going to be involved."

Bartlett, addressing a symposium at the National Academy of Sciences (NAS), noted that substantial legal and regulatory issues must be resolved before teletext and videotext systems can be fully developed and marketed in this country.

TV Displays Information

The systems, which use a television set to display computerized information accessed either by telephone line (Teletext) or by television broadcast (Videotext), are being developed and publicly tested in several European countries, most notably the UK and France.

The symposium held here recently, sponsored by the Board of Telecommunications-Computer Applications of the NAS National Research Council, featured several speakers who discussed the technology and policy issues related to these systems.

Addressing regulatory issues raised by Teletext and Videotext, Bartlett predicted the Federal Communications Commission (FCC) will be the government agency with the greatest impact on the systems' development.

Problem of Definition

The biggest problem in resolving the regulatory issues will be one of definition, he explained, since there is a tendency in Washington to "pigeonhole" new services in existing regulatory categories. It would be appropriate for the FCC to consider how [the systems] will be accommodated before they are marketed, Bartlett remarked.

Essentially, the FCC will have to relax some regulatory restrictions to accommodate Teletext and Videotext offerings, he said. The systems currently are permitted to be sent over telephone and cable television lines but not via television broadcast.

However, there are a lot of unused broadcast bandwidths, he pointed out, and there is no reason why some cannot be allocated to these new systems.

According to Bartlett, the FCC will also have to allow point-to-point communications in the systems, so electronic mail — an essential Teletext and Videotext service — can be offered.

Need for Electronic Mail

"We need a sound electronic mail system," he noted, a system that will make possible the transmission of messages "from home terminal to home terminal." Who will supply the services and what services will be supplied are primary questions the FCC must answer, Bartlett said.

Communications common carriers, under existing FCC regulations, may not offer Teletext services because such systems are essentially data bases and thus constitute DP services, which telephone companies cannot offer. Several symposium participants pointed out, however, that some telephone companies already offer computerized data base services, such as weather information and dial-a-joke.

Bartlett suggested that the FCC approach the subject as it did in its first Computer Inquiry, before the services are ready to be marketed and before a real regulatory problem has arisen.

Deciding on the separation of DP and communications services as early as the commission did was "one of the better examples of the FCC carrying out its regulatory function," he said.

To illustrate how complex the legal and regulatory issues surrounding these new systems are, Bartlett noted that Teletext and Videotext will offer newspaper services. What happens, he asked, when televised data bases "become newspapers?"

For example, television broadcasters are subject to a number of statutory provisions on obscenity and "equal time" allocation that do not apply to newspapers. In addition, newspapers generally enjoy greater protection under the first amendment than do television broadcasters.

This demonstrates, he stressed, the necessity of deciding in what category to put these new data base services.

"These data base services can develop on a competitive basis," he said, hopefully with as little regulation as possible."

Future Place in U.S. Market Seen For Teletext, Videotext Systems

WASHINGTON, D.C. — Teletext and Videotext data base retrieval systems are complementary, not competitive services, and both will find a place in the U.S. market, participants at a symposium held here recently predicted.

The systems are substantially different, according to Al Curll of the Semiconductor Research Department at Texas Instruments, Inc.

Videotext, sent via television broadcast, can offer only a limited amount of information because the types of services offered — news, shop-at-home, bank-at-home, and so forth — must be constantly updated, he explained.

Teletext, on the other hand, is accessed by telephone and can offer access to a "potentially infinite" number of data bases, Curll said.

The big difference between the two, he noted, is that millions of people can receive a single television broadcast, but the number of people who can use a telephone-based service is limited by the telephone system's capacity.

'Chicken and Egg' Problem

As to the potential U.S. market for the two types of systems, Curll said there is a "chicken and egg" problem. Development could be lengthy because the systems will be produced and offered by private companies, not the government, as in France and the UK.

Companies will be hesitant to offer services if consumers do not have the equipment to make use of them. At the same time, he continued, consumers will not be eager to spend money on hardware if the services are not being offered in sufficient numbers.

Curll added that the systems must be "granny proof" — capable of being used by all members of the family.

The development of color television encountered the same problem, he noted, and the industry took 10 years to reach maturity.

However, Edgar J. Gladstone, director of Quantum Science Corp., predicted that, assuming the data base retrieval systems are initially offered by cable television and can be available by 1980, cable television customers will use the systems by 1985.

Electronics in the Home

Gladstone said a consumer entertainment and information systems study being conducted by Quantum Science Corp. has found an increasing market for sophisticated electronics in the home.

By 1985, he pointed out, the average education level in the U.S. will be considerably higher than today which will add impetus to home use of systems such as teletext and videotext.

People will be more consumer-oriented, he predicted, and interested in more convenient, more energy-efficient ways of shopping, banking and obtaining information.

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International News

Honeywell, Yugoslav Firm Plan Joint Venture

MINNEAPOLIS – Honeywell, Inc. is in the process of developing a joint venture with a Yugoslavian firm, Elektronska Industrija (EI), for the manufacture of Honeywell's Level 6 minicomputers and some of Honeywell's serial printers and CRT terminals.

Although already approved by Honeywell's board of directors, the venture still requires approvals from the Yugoslavian government and the workers employed by EI, a company spokesman said.

Honeywell declined to comment on a French wire service article from Agence France-Presse that reported that the company would share an $8 million R&D expense with EI.

If the agreement is finalized, Honeywell will hold a 30% interest in the venture, EI-Honeywell Informacioni Sistemi, with the Yugoslavian firm, an electronic and electrical goods manufacturer, having a 63% interest. The remaining 7% would be controlled by Progres, Honeywell's trading agent in Yugoslavia, the spokesman said.

HIS Italia, Honeywell's subsidiary in Italy, which has been responsible for the company's marketing efforts in Yugoslavia, would become the liaison for the joint venture.

The venture must be approved by both the provincial and national governments of Yugoslavia as well as by the 200 workers at EI who would be affected by the project, the spokesman explained.

A five-person business board, consisting of representatives from each of the participating firms, will control the marketing activities of the venture. "There has been no decision on whether the goods will be manufactured for Yugoslavian consumption or for export," the spokesman said.

Although the venture does not require approval from the U.S. Department of Commerce, EI-Honeywell Informacioni Sistemi may not export its products to Communist countries or Rhodesia, a Commerce Department official said.

Because Honeywell has a substantial installed base in Yugoslavia and has had past trading arrangements with that country, the spokesman said Honeywell views the joint venture as an attractive means of expanding its computer business.

When asked to comment on the report that Honeywell will split an $8 million R&D expense with EI, the spokesman said, "The joint venture is a manufacturing concern, not an R&D investment. We do not have any comment on the dollar amount of the investment or the wire story," which prompted speculation on the investment.

Brazilian Commission Oversees DP Imports

RIO DE JANEIRO, Brazil – This country's Commission for the Coordination of Electronic Data Processing (Capre) has responsibility for controlling the importation of all DP equipment as well as examining user plans to determine whether their requests to upgrade their systems with imported equipment is necessary.

It is the government's general belief here that most users upgrade automatically with little planning and analysis of their decisions.

Capre cannot "explicitly" control computer manufacturing here but it can control it "implicitly," since it is responsible for setting priorities for importing parts, according to Mario Dias Ripper. Ripper is technical director of Serpro, the federal government service bureau and software company which employs some 15,000 programmers, systems analysts and designers. Ripper is also Serpro's representative on the Capre board.

Capre's authority is reinforced by the National Council for External Commerce (Cacex) which issues import licenses. Without prior approval from Capre, Cacex simply does not award such a license. Capre was organized in 1972 to serve the functions provided in the U.S. by the General Services Administration's Automatic Data and Telecommunications Service.

The organization is made up of representatives of the armed forces as well as the ministries of communications, education, treasury, industry and commerce and other groups.

Through these policies imports are kept within a yearly dollar quota without placing undue restrictions on any individual user organization. Capre is also responsible for helping develop local talent in the area of systems design, engineering and computer operations.

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Brazil Taking Bold Action To Hatch Mini Industry

(Continued from Page 67)

can meet the stringent government requirements, according to Marques.

Non-Brazilian companies applying for approval to manufacture here are asked to meet five criteria:

- Disclose their technology in a way that facilitates absorption of that know-how by Brazilian engineers and system designers.
- Demonstrate that within five years, products could be manufactured entirely here without importing any assemblies or ideas.
- Establish a joint venture with a Brazilian company.
- Produce systems primarily for the domestic market and secondarily for export.
- Control import of components.

This policy was announced in a formal resolution in July 1976, but most vendors here did not believe the government was serious about this plan. The real test occurred the following October at the National Data Processing Congress when IBM announced the System/32 would be manufactured in Brazil along with the 370/148.

IBM did not meet the criteria set by the government and was ultimately denied approval for this venture. IBM was denied approval primarily because of its own internal policies; the company is not known for its joint ventures or for sharing technology in countries in which it operates.

The policy on Brazilian computer manufacture and importation was reiterated in January 1977 when the government announced more stringent requirements including:

- Meeting a higher national index on goods produced.
- Showing that finished goods also had export potential.
- Providing total technological disclosures to the joint venture partners.
- Assuring controlling stock is in the hands of Brazil residents.

Companies that bid for rights to manufacture minis without Brazilian partners were rejected immediately. These included Burroughs Corp., Hewlett-Packard Co., IBM, Olivetti Corp. and TRW Corp., sources said. Unsuccessful joint bidders included CII Honeywell Bull, Inc., Philips Gloeilampenfabrieken, Nippon Electric Co. and Four-Phase Systems.

The outcome of this policy was seen on the exhibit floor here recently, and those companies which met the requirements are now beginning to ship systems. The activity at their booths showed a great deal of interest.

The market potential for minicomputers is sizable here even though cheap labor has kept the incentive to automate considerably lower than in the more developed countries. The installed base of all computers here grew from about 840 systems in 1972 to 5,963 systems in 1977, according to figures from International Data Corp.

The Brazilian government is planning to launch a similar plan to develop local capability in medium-scale systems. Still, the overall policy will do little to affect the operations of vendors importing large systems for sale here or manufacturing them locally without a Brazilian partner.

However, since importation of large systems will count against the overall national quota for imports, it can be expected that sales of such imported systems will flatten out in favor of locally produced minis and medium-scale systems when that effort is begun. As a result, users will be pushed toward distributed processing with domestic gear sooner than would have been their plan.

International News

Five 'Approved' Vendors at Show

Brazil Moving to Spur Domestic Mini Industry

By **Nancy French**
CW Staff

RIO DE JANEIRO, Brazil — The Brazilian Government's two-pronged action to establish a domestic minicomputer industry by excluding most minicomputer imports and authorizing five domestic manufacturers to provide systems is bearing fruit, judging from the equipment on display at the National Congress for Data Processing here last week.

Each of the five "approved" companies displayed its new offerings which are, in large measure, the outcome of joint ventures between Brazilian firms and foreign, non-U.S. manufacturers.

Today, users here who wish to acquire minicomputers may choose from the local brands, which range from small data entry systems to full-blown small business systems that run Cobol applications.

Cobra, a company formed as a joint venture between the government and private Brazilian capital, offers its Argus 700 process control system based on technology purchased from Ferranti, a firm from the UK that sold its first systems here to the Navy. Its business system is the Cobra 400, designed primarily for small business applications as well as data entry and data communications , networks, according to Cobra President Carlos Augusto Carvalho.

The system, which is based on Sycor 400 technology purchased from that U.S. firm, sells here for about $158,000. The price includes 20M bytes of fixed-head disk storage, eight CRTs and one printer. It can emulate Burroughs Corp. and IBM terminals and thus can be used as an interactive remote job entry terminal for IBM and Burroughs mainframes. It runs Cobol, TAL, an Assembler language, and LPM — an Algol-like language.

The TD200 is a data entry/-communications system with up to 32K of memory and two floppy disk drives. It can support a 600 line/min printer and magnetic tape unit. It is also programmed in LPM and costs about $15,000. The smaller TD100 supports only one floppy disk and is used only for data entry applications.

Edisa's Line

Edisa, whose foreign partner is Fujitsu Ltd. of Japan, offers two minicomputer systems and one key-to-floppy-disk data entry system.

The smaller of the two minis, the ED 301, was described as similar in capacity to the IBM System/3 Model 8. However, because of more recently developed Fujitsu technology, the performance and design are significantly different, according to marketing director Fernando Vieira Guimaraes.

A typical 301 configuration includes 24K of memory, 16K of control storage in read-only memory, one removable 10M-byte disk, a 290 line/min printer and one or two CRT terminals. The package costs about $110,000.

The Edisa systems support both Cobol and Fortran applications. They feature virtual storage and functions that were described as comparable to IBM's DOS/VS operating system.

Although all equipment prices seemed high, vendors pointed out that buyers actually pay a bit less than they would for foreign imports when customs duties and shipping are included. Computers here cost users about 300% of the U.S. list price.

This year, about 52% of the Edisa products will be manufactured in Japan and 48% here. By the fifth year, 74% will be produced here.

Since most of the products are still being imported as kits and vendors are only doing final assembly and testing here, no savings have showed up in price lists yet.

Sistemas de Informacao Distribuida S.A., a joint venture between a small Brazilian conglomerate that makes televisions (among other things) and Logabax, a French minicomputer manufactuer, is offering a range of systems that feature large memory capacities but only operate on programs written in Logol — a "management-oriented language."

The processor as well as peripherals, except terminals, will be imported from France at first.

Systems range from 64K to 128K, and the largest is said to support as many as eight workstations. A typical workstation includes one terminal with a floppy disk and printer. These systems also offer users networking and multiprocessing, according to executive vice-president Guy de Manuel, with up to six independent tasks operating at once. Prices range from about $120,500 to about $350,000.

The firm expects to sell 40 to 50 systems by year end and around 300 in 1979.

Although networking is being offered by vendors here, its use is limited by the high cost, short support and low reliability of telephone service — problems common to most Latin American countries.

Nixdorf Partner

Labo Electronica Ltd. (LABO), whose foreign partner is Nixdorf Computer AG of West Germany, is offering Nixdorf's 8870 line of systems.

A typical configuration for this vendor consists of a 64K-byte processor, one or two 10M-byte disk drives from Control Data Corp., one 150 char./sec serial printer and one CRT and is offered for about $92,000, according to the vendor.

The systems will be imported the first year and by the second half of 1979, Rudolph Oehling, president, expects to be assembling and testing here. The first parts of the system that will be manufactured here include cables and power supplies as well as cabinets, since the Brazilian partner is already one of the country's major furniture and cabinet makers.

The system runs on business Basic and Mumps, which recently gained standing as an Ansi standard language.

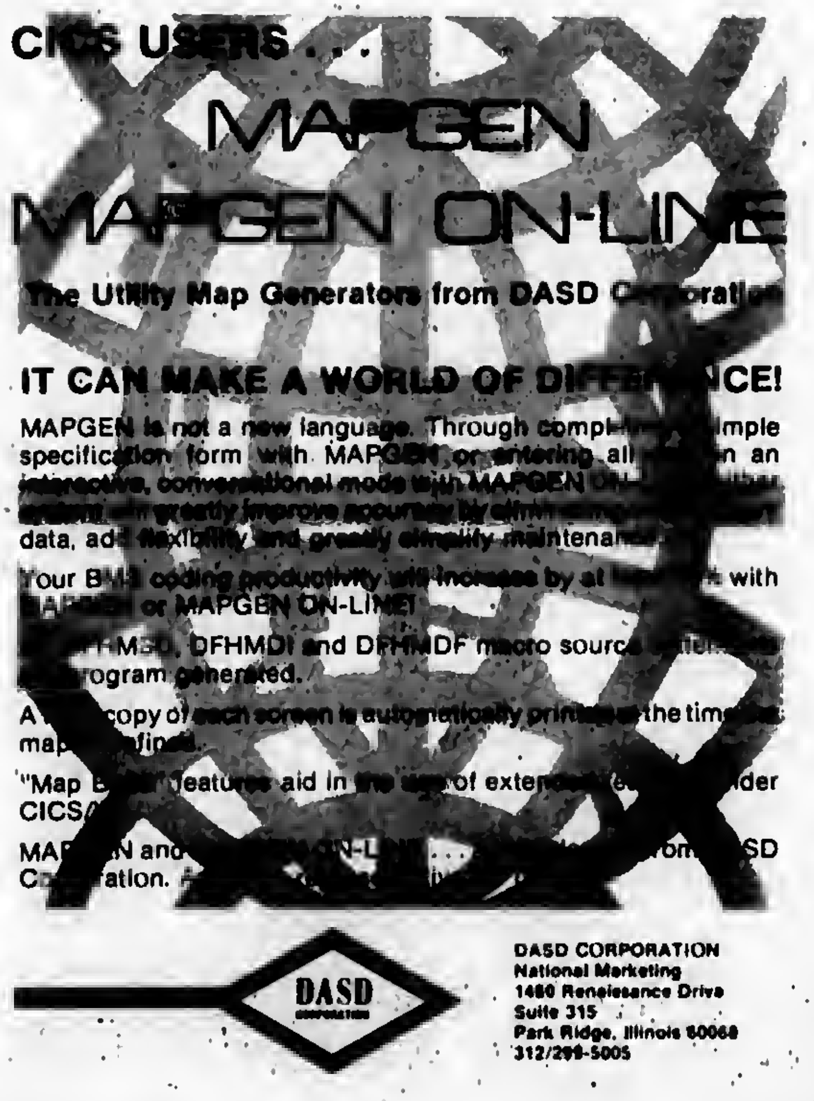
Controversial Vendor

Sistemas e Computadores S.A. (Sisco), perhaps the most controversial firm here, is a wholly Brazilian-owned maker. Despite early troubles because of underfinancing, the firm has finally gotten government approval for two systems described as "emulators."

The newest — the MB-8000, which emulates Data General Corp.'s Nova 3, is available with up to 128K words and is priced significantly lower than competing systems.

The DE 5000, described as a Digital Equipment Corp. PDP-8 emulator, was developed about four years ago but the company was underfinanced and Jose C. Melo, the company's founder, had difficulty entering the market when it was unregulated and difficulty gaining government approval to manufacture the system when it became regulated.

However, about one year ago, a well-known industrialist, Henry Macksoud invested about $25 million in the firm, which gave him the title of president and gave the firm a solid foundation for the first time.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Fairchild Now Fifth Firm To Sue DG for Antitrust

(Continued from Page 67)

argued.

Digidyne's suit claimed that Edson DeCastro, president of DG, "stated to the president of Ampex Corp. that Digidyne used DG's trade secrets and proprietary information in connection with Digidyne's design and manufacture of its D.D. 120 computer." In addition, Digidyne charged that DeCastro and other DG employees "have made the same or similar representations to other customers of Digidyne."

These representations, Digidyne alleged, "were made with the full knowledge of the continuing contractual relationships and/or pending sales negotiations between Digidyne and its customers . . . and they were made with the intent to destroy, injure or otherwise interfere with the business of Digidyne."

Charging that its reputation has been damaged, Digidyne is seeking punitive and exemplary damages of $10 million from DG.

Digidyne claimed it did not use proprietary information to design and manufacture its D.D. 120 computer, the design of which, it contended, is totally unique to Digidyne.

As in the Fairchild suit, Digidyne argued that DG has violated the Sherman Act by refusing to sell its operating system software independently of its hardware. "The purpose of the said scheme is to stifle, if not completely eliminate, competition in the Nova-compatible market, thereby preserving DG's monopoly position."

Bytronix filed a suit against DG on Oct. 5, alleging that DG used copyright laws to violate antitrust laws.

"Anyone who makes an emulator for a DG processor," Byronix's attorney said, "is a violator, according to DG, of trade secrets." Bytronix entered the DG-compatible processor market about a year ago.

George Allig, vice-president and chief financial officer of Bytronix, recalled that on one occasion, a representative of DG told one of Bytronix's customers that the company was violating DG's trade secrets.

Bytronix's suit is not a countersuit against DG but a declaratory action designed to prevent DG from suing the company.

Rounding out the list of litigants against DG, Ampex Corp. is currently involved in three actions against DG, one of which is an antitrust action, a spokesman said.

SCI could not be reached for comment before press time.

DG declined to comment on the flurry of suits. "As a matter of policy, DG does not provide comments on lawsuits," a spokesman responded.

High Court Denies Request By Racal-Milgo for Review

WASHINGTON, D.C. – The U.S. Supreme Court has turned down a request by Racal-Milgo, Inc. to review charges of antitrust activities in the modem market filed in a 1976 lawsuit against Western Electric Co., Inc.

The request, filed in August and denied last month, stemmed from a 1976 countersuit filed by Racal-Milgo in response to Western Electric's 1974 suit charging Racal-Milgo with patent infringement.

The 1974 suit claimed Racal-Milgo had violated 10 patents on a broad range of modem types. Racal-Milgo's countersuit alleged Western Electric's Dataphone 208 and 209 modems infringed on four of Milgo's patents.

Racal-Milgo also charged in its countersuit that Bell System's tariffs levied on the interconnection of customer-provided data modems violated antitrust laws.

Specifically, Racal-Milgo took issue with Western Electric's requirement that data modems be connected to the nationwide telecommunications network only through a Data Access Arrangement (DAA).

The U.S. district court in Florida, however, found Western Electric to be immune to antitrust laws on the ground that the Federal Communications Commission has exclusive jurisdiction over such issues.

Racal-Milgo appealed that ruling, but the appeal was dismissed as premature because other antitrust claims in the case were and are still pending.

A spokesman for Racal-Milgo's legal department said the company intends to try the issues now pending before the district court in Florida. When that decision is final, the company said it will go to the Fifth Circuit Court of Appeals and ask it to then decide on the DAA counterclaims.

Racal-Milgo will try to get the case heard before a jury, the spokesman said.

Western Electric declined to comment because of the other pending actions.

Contracts

Computer Sciences Corp. has been awarded a three-year contract valued at $7.2 million to provide computer-based services to the Naval Weapons Center in China Lake, Calif.

United Scientific Corp. has received a contract from the U.S. Department of Commerce to provide the world's first commercial, superconducting Josephson junction voltage standard systems.

The Computer Communications Group of Bell Canada has received a contract valued at $1.5 million annually from Societe d'Exploitation des Loteries et Courses du Quebec (Loto-Quebec) for the Loto 6/36 weekly numbers game.

Cubic Corp.'s Defense Systems Division has been awarded a contract for $8 million to provide air-to-air combat pilot training system (Air Combat Maneuvering Range/Instrumentation). The system will be built and installed for the U.S. Air Force off the coast of the Philippines.

POSITION ANNOUNCEMENTS

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Wang Is Hungry For Good People

Let's face it, the job market for experienced software designers and implementors is a tough one. If you're the kind of person Wang wants, you probably aren't reading this ad; you're too busy meeting the challenges and goals of your current employer.

Sure, we're growing at 40% a year, and this means new jobs and better career opportunities for our employees, but so are many of our competitors. So why should you give up some of your important time to talk to us? This is why. The Wang difference is in orderly and planned growth. Look at the Wang VS, the world's lowest priced 32-bit virtual memory based computer system. Physical memory of 512K bytes with on line disk storage expandable to 2.3 billion bytes. This is a family of computer systems all running under the same structured operating system. Special emphasis was placed on designing a "user-oriented" system which is easy to learn and use even by relatively unsophisticated end users.

The VS was planned, designed, and implemented by a team of hardware, firmware, and software people all under the same roof. Our operating systems, data base management, firmware and compiler development people all report to the same management, consequently, they all talk to each other. Software development at Wang means integrated and extendable functionality for our users; it also means that our system programmers/designers know what is expected of them and where they're heading with their careers.

If this kind of structure appeals to you, please contact us about the following positions.

Data Base Implementors

Want to build a major new DBMS? Get into page formats, indexing schemes, and pointer arrays! Find out how to optimize search paths for complex queries. Program and test algorithms for storage and data structure access. Learn why integrity, protection, and data independence are central concerns of our DBMS. If you think you can benefit from working with some of the best DBMS designers in the world and are already a top-notch implementor of systems software, let us hear from you.

Data Base Systems Designers

You will be a specialist on a design team and perform key functions in designing the architecture of future data base management systems.

This is a highly visible position in our advanced Software Development Group, providing an opportunity to influence DBMS state of the art. If you have experience in data base security, integrity and recovery, and are familiar with the requirements for data communications and distribution of data as well as a strong interest in designs supporting multiple end user interfaces, this position should be of interest to you.

Senior Technical Writer

This position offers an important and unique technical writing opportunity to work directly with the research and development group responsible for Wang's new virtual memory computer systems.

The right person for this job enjoys understanding, documenting, and explaining the functional structure of operating systems, compilers, firmware, and computer hardware. This person will collect and edit all inter-group technical communications while maintaining functional reference manuals, developing program logic manuals, and coordinating the flow of user-oriented product development information to an external technical writing group.

Necessary qualifications include technical writing and assembly language programming experience. Knowledge of IBM 360 or 370 Assembly language is a definite plus.

Language Developers

The VS Language Development Department has openings for people to do the design, implementation, and maintenance of the following products: BASIC, PL/1, COBOL, and FORTRAN compilers, at least one and perhaps two Query Languages, which will interface with the DBMS, and several DBMS support compilers. There are openings at the task or project leader, senior systems programmer, systems programmer, and junior systems programmer levels.

Systems Programmer

Product Integration Specialist

Working directly with the Advanced Computer Systems Development Group on Wang's new 32-bit Virtual Memory Computer Systems, this position offers a unique opportunity for a personable systems programmer to learn product management and marketing skills. Eventual responsibilities include consultation on overall systems development and technical support of marketing activities. Initial responsibilities include coordination of multi faceted projects, analysis and documentation of existing software systems, and design and implementation of system utility program.

The right person for this job has applicable assembly language programming experience and good verbal communications skills.

We offer excellent salaries and benefits. Please forward your resume, including salary history and position or positions of interest, to Gary C. Bionglewicz, Manager Professional Recruiting, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851; or call him at (617) 851-4111.

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- Assessing the operational efficiency, management practices, and organizational effectiveness of data processing installations. Applicants for these positons should have experience in EDP management, EDP auditing, or EDP management consulting.
- Performing capacity planning studies, which include workload requirements analysis, configuration sizing and communications network design and evaluation, and providing ADP procurement assistance in such areas as benchmark design, specifications development, proposal evaluation and life-cycle planning. Applicants for these positions should have experience with hardware and software evaluation and with computer and/or communications system modeling techniques.
- Assessing the design and predicting the performance of special purpose computer systems, and analyzing the overall performance of complex systems that contain computers as integral subsystems. Applicants for these positions must be knowledgeable in Operations Research techniques, computer operating systems, and discrete-event simulation languages.

Salaries range from $15,090 to $30,750 with excellent opportunity for management responsibility. Advanced degree desired. Send resume of qualifications and salary history to:

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Senior Software/Hardware Design Architects

An invitation to join one of the most ambitious and creatively challenging architectural undertakings ever launched at NCR.

NCR is now assembling what may well be the most able and farsighted architectural teams in the country. The new highly select group we're forming will be charged with no less than the creation of a systems architecture that will cover the full spectrum of business data processing requirements. The work it does — the decisions it makes — will be the basis of NCR's future far into the 1980's.

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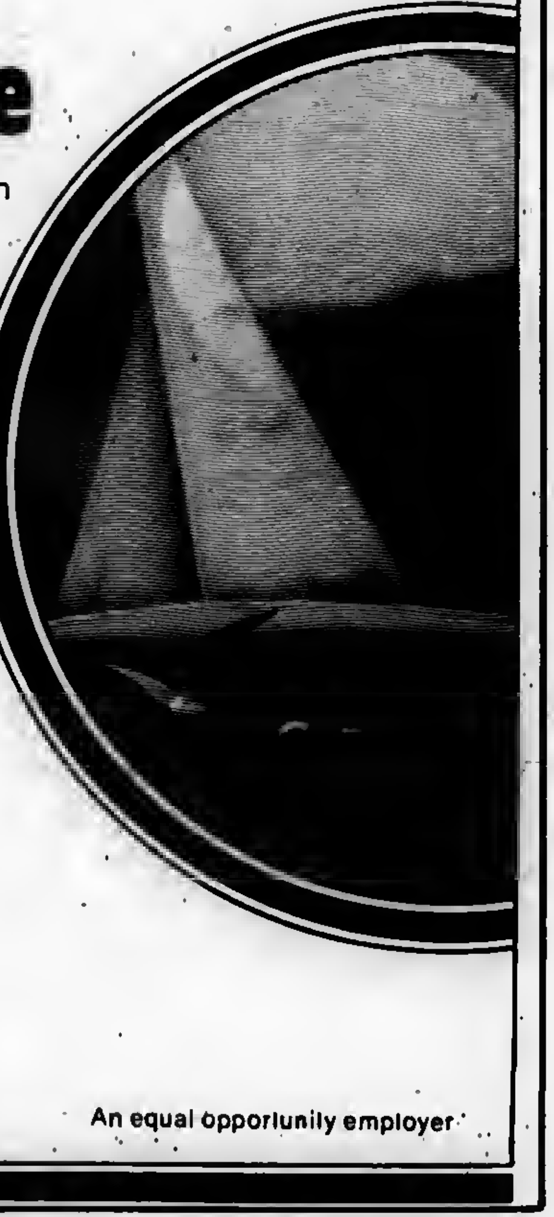
Architecture in the broadest sense

You won't be simply modifying existing systems or solving narrowly defined problems. You'll be interacting with various engineering and software organizations within the corporation. Your strategic and architectural decisions will determine the requirements for multi-plant implementation of systems and subsystems. Your only constraints will be present system compatibility and broad marketplace realities of the future. You'll have more creative freedom than you've ever had before.

Specific backgrounds needed

You'll be working at NCR's highest technical levels. We're seeking systems architects with experience in the following areas: open-ended multiprocessing; distributed processing; distributed data bases; transaction and interactive processing; concurrency control; backup and recovery; reliability-privacy-security; languages and protocol standards; and migration engineering.

San Diego Lifestyle



NCR's pioneer development group is located in Rancho Bernardo, 22 miles up the coast from San Diego. Our 115-acre hilltop headquarters has been called "one of the 10 best-designed industrial facilities in the nation". We'll give you a working and living environment that's the envy of the EDP industry.

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For a high level review of your qualifications, and a prompt in-depth briefing on your future at NCR, send confidential resume and salary history at once to: Mr. Frank Drdek, Manager, Personnel Resources, Dept. L50, NCR Corporation, Systems Engineering, 16550 W. Bernardo Drive, San Diego, CA 92127.

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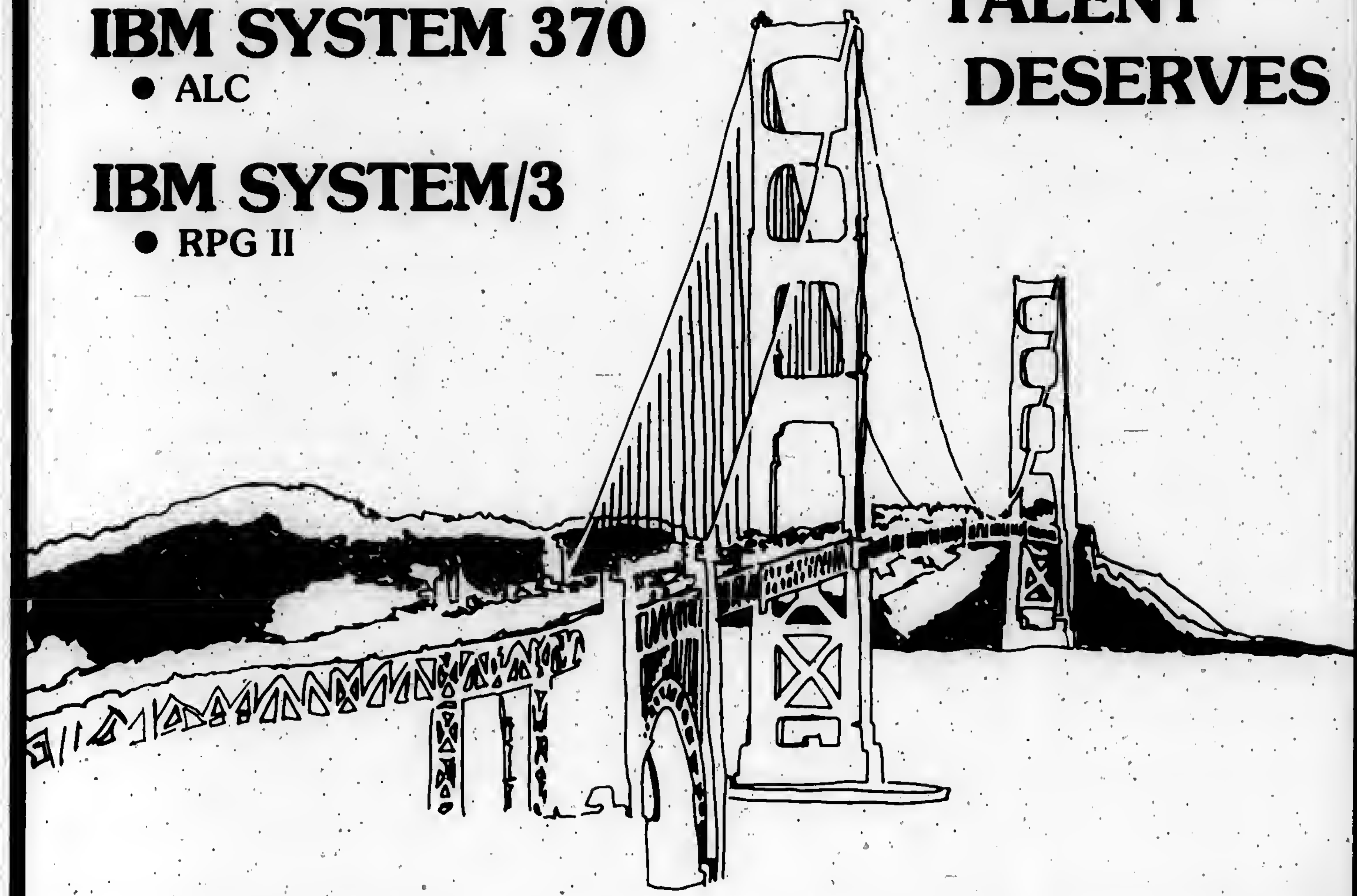

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Please call **(415) 768-3196 (collect)** or send resume in complete confidence to: **Tom E. Lyon, Bechtel Corporation, Dept. 15-27-8, P.O. Box 3965, San Francisco, CA 94119.**

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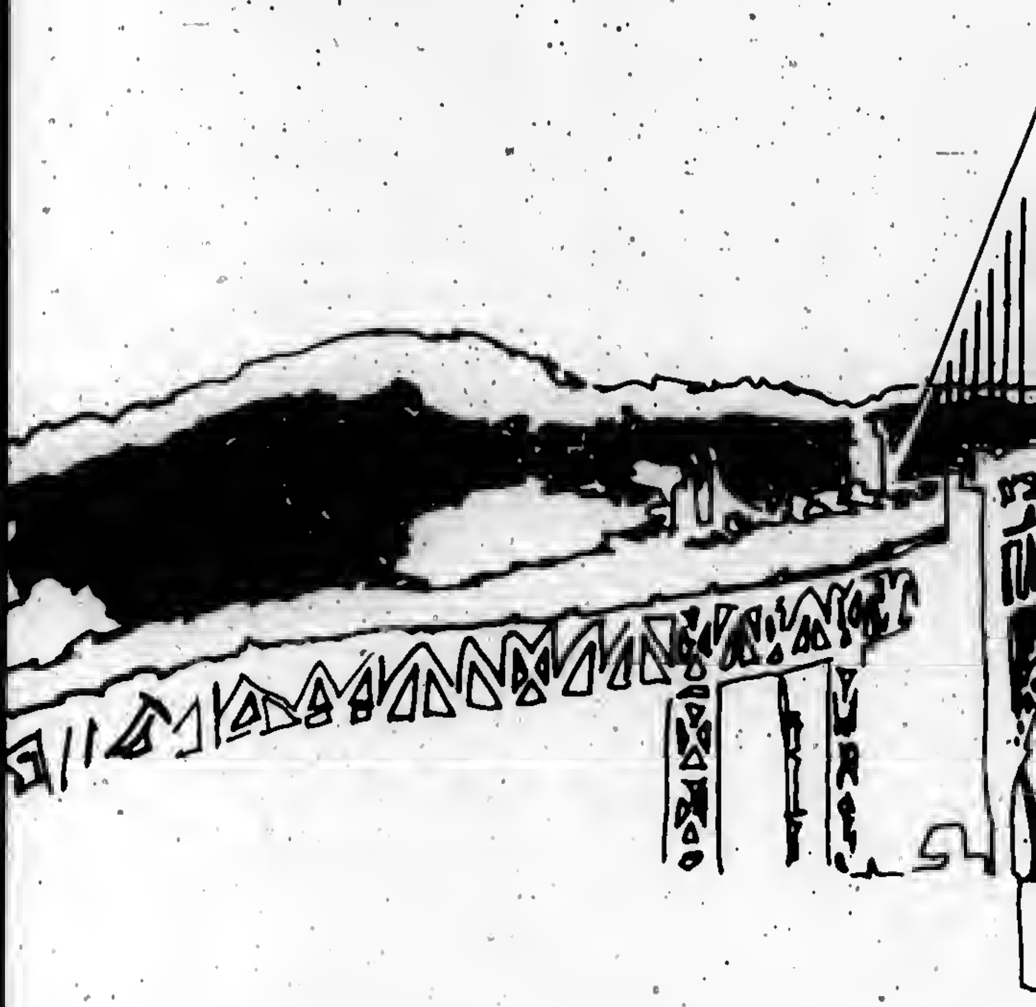

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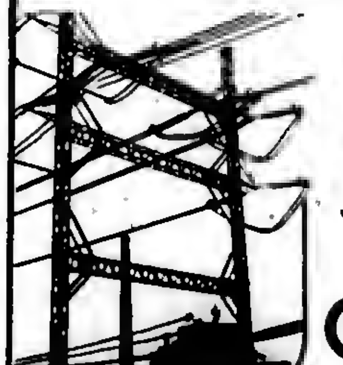

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Key opportunities in Corporate Information Services

Intel began 10 years ago with a strong commitment — to be the best in whatever we do. That commitment has led Intel to a position as the #1 supplier in each of our product areas. And it has resulted in a fast-growing Corporate Information Service group dedicated to providing industry-leading systems to our users. Critical to our success is the addition of highly motivated professionals for these key opportunities:

Manager, Data Base Administration

This highly visible position demands data processing expertise complemented by a good overall grasp of the major business functions. The position will have total responsibility for corporate-wide administration of our CODASYL data bases. Specific responsibilities will include integrating manufacturing, marketing, finance and personnel data processing systems, setting standards for on-line system architecture, designing data base schemas and conducting technical system design reviews. To qualify, you should have 3-5 years experience in a manufacturing environment designing and implementing application software. Previous management experience and a working knowledge of large-scale data management systems are also important. MS in computer science or related field and an MBA also preferred.

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If you're a top-notch systems programmer seeking greater challenge, this is your opportunity to be involved in one of the most complex and sophisticated areas of the operating system. Specifically, you'll architect corporate data communication strategies (including international applications) for Intel's Univac 1100/80. To qualify, you should have at least 4 years of experience, including at least 1 year with Univac 1100 software, particularly Univac's CMS real time communications hardware. Degree in computer science or mathematics (or equivalent experience) preferred.

Business/Applications Programmers

We have continuing intermediate and senior level opportunities in manufacturing, marketing, finance and personnel. If you have experience in any of these areas, we'd like to hear from you.

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The City of Bloomington is seeking an innovative individual to manage a progressive data processing operation. Individual selected will interface with user departments, developing and implementing a wide variety of applications.

System currently consists of Burroughs 1700 with communications. Staff currently consists of eight persons and there are two planned additions.

Position requires a minimum of six years progressive professional programming and systems development experience and demonstrated management ability. Applicant should also have experience in data base management.

Interested, qualified applicants send resume, including salary progression and expectations to: Personnel Department, City of Bloomington, 2215 W. Old Shakopee Road, Bloomington, MN 55431.

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A small, friendly, highly cohesive group, we're dedicated to creating sophisticated value-added software and to building accurate, advanced diagnostics for testing and rectifying new systems. Here you'll have first contact with our latest products in a professional environment where your individuality can thrive. If you seek extensive customer contact and state-of-the-art involvement, Systems and Applications will more than meet your needs.

Applications Programmers

We need several individuals at most levels to participate in a wide variety of customer specific and standard software projects such as banking systems, data entry, airline reservations and similar real-time terminal applications. You will have the opportunity to work in diverse areas and to interface extensively with users' technical personnel.

Required are 3 years real-time assembly language and minicomputer experience. Exposure to communications, teleprocessing, remote batch, IBM 3270, Burroughs TD820, Uniscope 100/300, and/or VIP 7700 would be helpful.

Diagnostics Programmers

In these mid- to senior-level positions, you will be responsible for the development of comprehensive diagnostic routines for a variety of processors, peripheral devices, and applications for our current product line and for new products. You will be the first to have programming contact with our latest advances, employing such software as off-line diagnostics, test operating systems, fault detection monitors, and special purpose test bed programming.

You should be equally comfortable in an electrical engineering, as well as a software development environment and be ready to apply both disciplines to this important function. A knowledge of assembly language and experience with LSI and semiconductor devices is required.

ADVANCED SYSTEMS DEPARTMENT

Advanced Systems is responsible for developing software systems compatible with our new hardware products, including a new distributive data-processing network-oriented terminal system. Involvement here satisfies the needs of professionals who demand the highest level of technical interface. In a genuine ground-floor environment, you can help to make significant architectural and product decisions in the following areas:

Compiler Development

The ability to work and communicate with others and to contribute to a group effort is central to your success in this highly demanding compiler development position. You will need a BS or MS in computer science and at least 3 years experience in compiler development. Also required is one block structured language such as ALGOL, PL 1, PASCAL, C, or BLISS.

Operating System Development

You will undertake responsibility for the design and implementation of operating subsystems, and contribute to the overall requirements definition of the operating system. You must be capable of implementing thorough knowledge of controlled file access, multi-level directory systems, and sequential, random, and index sequential access methods.

The successful candidate will have a Bachelor's degree in computer science and 3 years experience. You must have participated in the design and implementation of an operating system, and a working knowledge of data base systems and requirements is desirable.

Leader, Operating System Development

Employing your strong technical knowledge and good managerial and leadership skills, you will undertake full responsibility for the design and implementation of the operating system. You must have at least 6 years experience including prior participation in the design and implementation of an operating system. A working knowledge of contemporary minicomputer-based operating systems is desirable.

Verification

You will have responsibility for ensuring that a quality systems product is developed. Specifically, you will develop, construct, and execute test programs and participate in design, code, and specification reviews of new software products. In addition, you will help monitor the building of the system in order to rapidly identify schedule inaccuracies and conflicts.

Required are a strong technical background in systems software and at least 2 years experience in developing and/or testing systems software. Your most recent experience should be in the area of compilers or operating systems. A strong background in mathematics is desirable.

Senior Technical Writer

We need a technical writer to produce internal and external system documentation using information obtained from formal design discussions and specifications. Additionally, you will help to establish documentation plans and identify documentation requirements as well as coordinating production of completed manuals.

You must have a strong technical background in systems software and at least 2 years experience in technical writing for a computer manufacturer or software vendor.

Firmware Programmer

This individual will write firmware programs for new state-of-the-art microprocessors. You must be hardware and software savvy, super-competent, and intelligent. You must be a perfectionist who can spend hours squeezing a single line of code out of two hundred. You need not have experience in this area, only the certainty that you can handle this demanding position.

ENGINEERING DEPARTMENT

Ours is a small, friendly department engaged in numerous highly challenging projects. If you want to work in an environment where you will be given design freedom and your contributions will be noticed, then Incoterm's Engineering Department is the place to work. We have several opportunities in the area of hardware development for qualified professionals who wish to engage in projects of maximum impact.

Mechanical Design Engineers (All Levels)

Your responsibilities will include the design of CRT Terminals, Processors, sophisticated Automated Banking Equipment and special purpose terminals utilizing state-of-the-art electro-mechanical technology. Required are a BSME or equivalent with experience ranging from a desire to 10 years in computer oriented packaging. You will be exposed to design in plastics, castings & sheet metal, backplane interconnection techniques, and the design of paper handling devices/mechanisms.

Product Support Engineers/Mechanical

The successful candidate will provide design engineering support in the resolution of problems encountered by our manufacturing and customer service groups. Participation in design reviews, new product introduction, vendor surveys, and the continued maintenance of design integrity are key elements of the responsibilities of the positions.

Required are a BSME or equivalent with related experience in the commercial/military electronics industry. A thorough knowledge of electro-mechanical fabrication and assembly techniques is also required.

PRODUCT DESIGN

Drafting Personnel

Openings exist at all levels for electrical and electro-mechanical draftspeople. Your responsibilities will include layout for digitizing electrical schematics and logic diagrams, electro-mechanical design layouts, assembly, and detail drawings.

Printed Circuit Designers

We need intermediate and senior level PC designers with experience in medium to high density state-of-art two sided boards. Multi-layer and automated design experience would be a plus.

Product Safety Coordinator

We're looking for a confident, qualified individual to assume responsibility for submitting new products to Underwriters Laboratories and the Canadian Standards Associate for examination. You will also be responsible for subsequent listing and certification.

You must have outstanding written and verbal communication skills, firm attention to detail, and a systematic approach to the maintenance of records and related material. A fundamental understanding of basic electrical and mechanical engineering, as applied to commercial electro-mechanical devices, is also required.

MARKETING

Our marketing efforts require the aid of a top marketing professional capable of producing solid, successful results in the following position:

Product Support Specialist

We need an individual to provide technical software support to the director of systems integrator marketing for assigned prospects. You will be required to maintain a current and complete knowledge of all Incoterm product lines, both current and future, as well as knowledge of major competitors' products to assure a continuous competitive advantage.

If you are interested in, and qualified for, any of the above positions, please forward your resume and salary history to Joe Dugan, Dept. C-1106, Incoterm Corporation, 65 Walnut Street, Wellesley Hills, Massachusetts 02181.

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Mini-Computer Programmer

PDP 11/45 7/32, 8/32 DG NOVA SEL 32/55, HP 3000, Honeywell Level 6 H 716, Two years exp. Req. Suburban Virginia & Md. locations. U.S. Citizenship req. $17-23K. Relocation Pd. Rush resume: Cybermetrics Corp., P.O. Box 579, McLean, VA 22101 Tel (703) 356-1997. Other positions avail USA & OS.

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Professional position utilizing IBM 3033, OS/VS1 (converting to MVS), ADABAS, CICS, and an on-line program maintenance facility. Duties include analysis, design and programming of Admissions and Records systems. Bachelor's degree and minimum 6 months working experience with COBOL in an applications environment required. Familiarity with management information systems, on-line and integrated data base environments desirable. Starting by January 15, 1979. $15,000 to $16,500; excellent benefits: 20 days vacation per year, plus holidays, state retirement plan, etc. Send resume, letter of application, transcripts, and three letters of recommendation by December 1, 1978 to Director of Student Administrative Services, Metropolitan State College, 1006 11th Street, Denver, Colorado 80204, Attention Box 18. (303) 629-2958.

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ENGINEERS

even if you're not looking

You're employed and you're reasonably satisfied with your current status. But if you're a professional with high aspirations and the talent to achieve, you manage to keep current with the job market. Just in case.

And keeping current means awareness of what's out there, spotting exceptional opportunities and exploring offers when you're not under the gun.

Which brings us to an exceptional opportunity.

Few industries today offer the career potential that's available in automatic test equipment. The LSI revolution, a shortage of technical talent, escalating field-repair costs all are focusing attention on automatic test equipment as one of the keys to the growth of the electronics industry over the next decade.

If that interests you, then Teradyne should interest you. Because Teradyne is the largest company specializing in automatic test. And the company with the broadest involvement in that field, with test systems for digital and linear integrated circuits, in-circuit and functional board-test systems, laser trimmers, backplane test systems, discrete semiconductor testers, and test systems for telephone lines.

Sales are currently running at a rate of over $80 million (quadruple the level of six years ago), and Teradyne is moving fast. Plant locations are in Boston, Massachusetts; Woodland Hills, California; and Northbrook, Illinois; and sales and service centers are located throughout the U.S., Europe, and Japan.

Our success in the test equipment field stems from our broad technology base, the contributions of creative professionals and the ability to sense what the customer needs even before the customer does. Our success in attracting and retaining the best people rests on what we offer: a tremendous amount of personal freedom, involvement in some very challenging projects and a share in the company's success.

So even if you're not looking, we'd still like to talk to you. Our particular interest is in professionals who are currently working in these disciplines:

SOFTWARE ENGINEERING

- Direct control of real time analog and digital instrumentation
- Simulation of LSI digital logic components and boards
- Man-machine interface design

ANALOG ENGINEERING

- Develop a thorough understanding of our customer's test requirements
- Design high performance reliable analog instrumentation.
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It's smart to explore your options. Write or call collect: Vin Puglia, (617) 482-2700 for Boston opportunities or Jerry Cellner, (213) 993-1343 for Los Angeles opportunities.

And look to Teradyne . . . even if you're not looking.

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APL

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Microdata is located in beautiful Orange County, California only 10 minutes from the beach and 50 minutes from the mountains. Enjoy living and working in an area typifying the best of the California lifestyle. In addition, Microdata offers excellent salaries and fringe benefits including company paid life, medical and dental insurance. For more information call P.A. Taylor at (714) 540-1113 or send resume to:

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Computer Special Systems is an international organization dedicated to meeting the special needs of Digital customers. More than 900 people in locations throughout the world contribute to our efforts. As a widely experienced system organization, CSS provides a range of special solutions, from processor interfaces and handlers to multi-processors, complete turnkey systems, and more. We currently have several important positions for diversely talented computer professionals who seek management responsibilities and marketing rewards.

Manager, CSS Software Engineering

Maynard, Massachusetts

You will support the CSS product line manager by coordinating the worldwide CSS software development groups with each other and with Digital. Developing and coordinating information exchange regarding major projects, products, and development methods, you will act as advisor to all CSS business managers and product line manager on all matters involving software development, represent CSS in interfacing with other software development groups within the corporation and review and recommend budgeted operations for development functions. You will also provide strategy, standards, and procedures, special studies, and coordination and development of training programs.

Required are a BS in science or engineering or equivalent and 8-10 years managerial experience in a staff or line function with relevant responsibilities. An MBA would be highly desirable.

All the following positions are located in Santa Ana, California, and Nashua, New Hampshire.

Managers, Systems Development

We need individuals to organize, plan, structure, utilize and manage resources to develop quality products, application software, and turnkey systems.

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You must have had prior experience in a major product or project development, sound technical and managerial ability, and knowledge of the marketplace. Good communication skills, fiscal management capability, and a track record in project management and systems software are also required.

Commercial Product Group

Software Engineers

A wide variety of involvements await software engineers in the Commercial Products group. Your projects will focus on such direct customer applications as: data base management, data entry, transaction processing, general financial, general ledger, accounts payable and receivable, inventory, and payroll. We need talented individuals now to assume responsibility as senior programmer, systems analyst, lead programmer, technical leader, and commercial programmer; your position will be commensurate with your experience and abilities.

You must have 3-5 years experience and be familiar with DIBOL, COBOL, and ASSEMBLER languages. Also required is experience using RSTS/E, RSX-11M and/or CTX-300 operating systems.

Commercial Firmware Engineering/ Data Communications Group

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We need development-oriented individuals to design, implement and test software for state-of-the-art communications projects. Required are 2-5 years of experience in developing software and/or microprogramming on Digital's or Intel 8080 modules. Experience with PDP-11 assemblers, data communication protocols or networks, and RSX operating systems would be highly desirable. Members of this group are key consultants to marketing and enjoy high visibility in the Commercial Product group.

Technical Software Group

Principal Software Engineers - Systems

You will assume project management/technical leadership of customer funded software turnkey projects, with responsibility for all phases of these projects: application, qualification, quotation and proposal, systems and design specifications, implementation, debugging, and installation. You will also be responsible for planning, budgets, and schedules.

A BS in EE, CS, or related field or equivalent is required and an MS would be a real plus. You must have a minimum of 5 years successful experience, including experience with the PDP family of computers and RSX operating systems. With primary emphasis on real-time data acquisition, process control, special interfaces, handlers, and drivers, you must be capable of programming in FORTRAN IV, MACRO, and BASIC. Also required are interpersonal skills for project management and analytical capabilities for debugging programs. You must be conversant with the latest software technology, such as structured design, HIPO, and PSUEDO codes, and walk through and review techniques.

Product Development Group

Diagnostics Software Engineers

Working closely with hardware engineers, you will design, implement, debug, test, document, and support diagnostic programs for CSS projects. You must be capable of handling sophisticated projects independently under limited supervision.

Required are a BSEE or equivalent hardware experience and experience in programming computer peripherals, including mass storage devices, in at least one of Digital's assembly languages, preferably MACRO-11.

If you are interested in one of the above positions, please forward your resume with salary history to Hank Vezina, Digital Equipment Corporation, Dept. C1106, 3807, 55 Northeastern Boulevard, Nashua, New Hampshire 03060. We are an equal opportunity employer m/f.

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Sweetwater Union
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We are going national with a leased, packaged software and hardware mini-computer system aimed at a selected field. Knowledge of business accounting methods and BASIC language a must. Familiarity with Olivetti P6060 helpful but not required. Successful applicant will be in charge of systems programming and modifications. Beginning salary based on qualifications. Ultimate participation extremely attractive. Submit resumes and salary history to Club Computer Services, Inc., 38 Willis Avenue, Mineola, N.Y., or call (516) 741-5568.

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Function as Deputy Project manager, supervise staff of 15 in organizing, auditing, and documenting a very large social science data base. Interact with researchers on issues of sample weighting, derived variable construction, and data reliability.

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Have you considered the possibilities of an overseas assignment? For the right individuals, the opportunities for personal, professional and financial growth can be considerable.

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Iran

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Lee Shope
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University of Iowa
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P.O. Box 220
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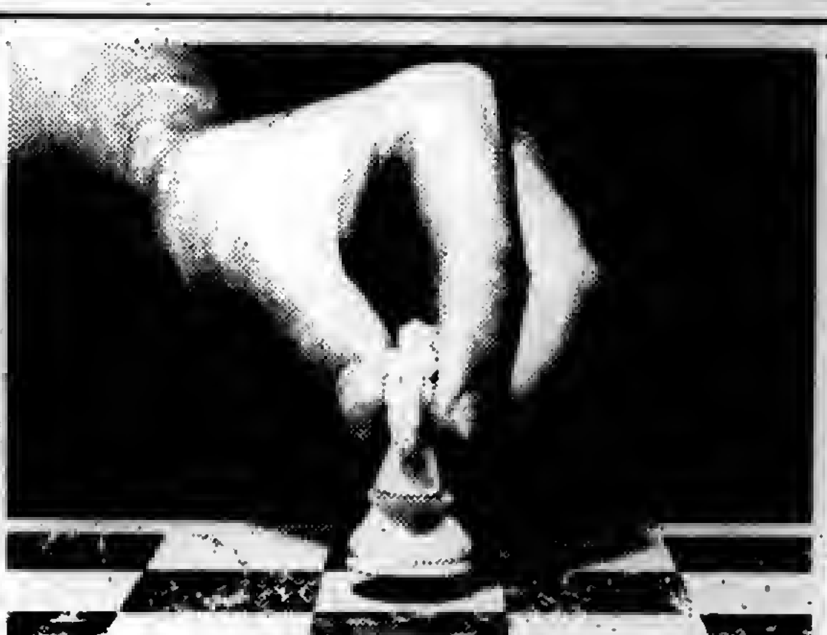

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Seeking individuals to participate in the continued development of the RAMIS II system.

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Our work includes applications in energy planning, production and distribution, economic and financial planning, engineering and construction, billing and personnel.

Your duties range through feasibility studies, design, implementation and maintenance utilizing both on-line and batch processes on IBM 158 AP and Amdahl central processors with large CICS network and TSO.

Experience more important than college degree; our training program is geared to individual needs.

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Board of Governors
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Located in west suburban Chicago, the Cooperative Computer Center (CCC) serves the administrative data processing needs of three Board of Governors institutions: Chicago State University, Governors State University and Northeastern Illinois University. Resources include a staff of 60, production software developed by SCT Corp. and an ITEL AS/4 computer supporting several RJE stations in an OS/VSI environment.

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Send resume, references and salary history to:
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Chairman, CCC Director Search Committee
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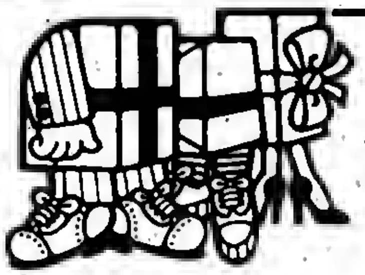

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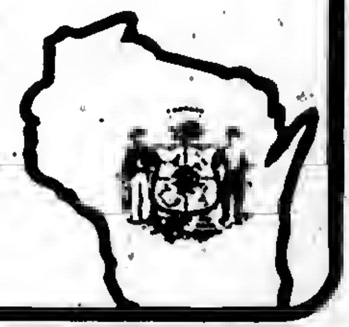

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MARKETING REPRESENTATIVE

If you are in the top 20% of your marketing organization, making $35,000 + and have background experience in the Office Products and/or Data Processing Industry, we would like to talk with you.

OPPORTUNITY

DELTAK, the world's largest video publisher of Data Processing and Management Development Training programs, is looking for additional marketing representatives. Our growth rate has averaged around 60% annually, and now opens the doors for career advancement for top quality individuals. Historically, DELTAK has chosen to promote from within, which provides for further opportunities and advancement.

ENJOYMENT

An opportunity to create - to help us continue the growth of an outstanding company, in an exciting new industry. The acceptance of television as a training tool by corporations has caused our industry to be one of the fastest growing, worldwide.

SALES EXPERIENCE

You will be marketing DELTAK's products and services to the top executive from the Data Processing and Management Development industry. Previous Data Processing experience would be desirable. Our key prospects/customers are the top Fortune's 500 companies in North America. Typically, successful DELTAK marketing reps are those individuals who have mastered the art of selling, combined with excellent organizational skills and sound business acumen.

We require a minimum of three years demonstrated top sales performance with such companies as Xerox, IBM, or one of their competitors.

DESIRE

The common denominator for success in our business, is a strong desire to work hard and be successful. Frequent 10-hour days are not uncommon among our sales force.

COMMUNICATION SKILLS

Possession of excellent communication skills, both written and oral are also key attributes. Our marketing representatives are often referred to by the Industry as a group of "true professionals."

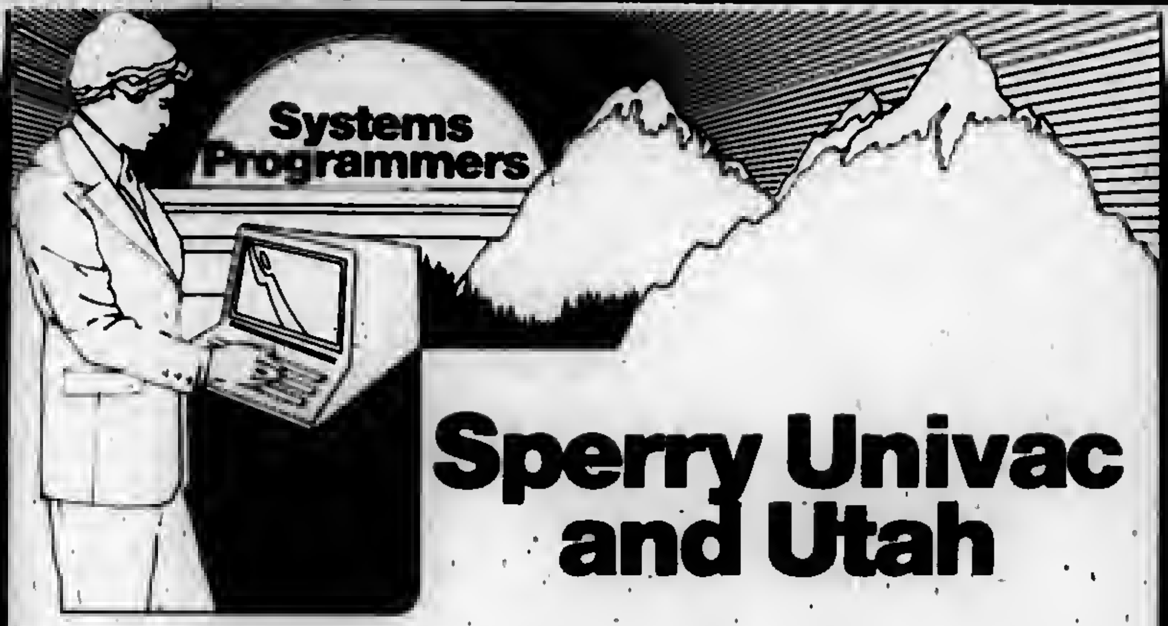
RESPONSIBILITY

Our company is growing. We need individuals who seek to mold their future, and play a part in the fulfillment of our corporate objectives. If you feel you have the experience and desire, please write, enclosing resume, to:

Mr. Tom Geraghty
District Manager.
1133 Ave. of the Americas Suite 230
N.Y. 10036
(212) 575-0285

DELTAK

An Equal Opportunity Employer M/F



Sperry Univac and Utah

Where the Best of Both Worlds Come Together

WHERE we'll provide you the challenge of exploring the unexplored in meeting our communications and terminals need of today and in the future. WHERE you'll enjoy the excitement of a unique life style amid some of the most spectacular mountain scenery in the United States.

WHERE you can apply your analytical skills to the design, development, and implementation of systems software for data communications, networks, data entry, terminal handlers, and operating systems. Or participate in customer support of systems software for our communications and terminals products. Development will include formal design, documentation, coding and testing. BSCS or equivalent experience.

WHERE you will receive an excellent benefit package consisting of: Comprehensive medical and maternity; Life, dental and travel insurance programs; Retirement plan; Accident and sickness, sick leave and long-term disability (income protection); Paid holidays and vacation; Educational reimbursement; Stock purchase plan; Company-sponsored training programs.

Call toll free: **1-800-453-4534** or, send resume complete with salary history to:

Employment Department
322 North 2200 West
Salt Lake City, Utah 84116

An Equal Opportunity Employer M/F

SPERRY UNIVAC

Programmers & Analysts

San Francisco Peninsula

Our Business Systems Department needs responsible people to assist in the development of financial, engineering, manufacturing, product assurance, and material systems. These openings are in a data base environment and processing is being changes from batch to on-line.

Education requirements include a BS in Business, Mathematics, Computer Science or work experience equivalent.

PROGRAMMERS - one to three years' experience
PROGRAMMER ANALS - two to five years' experience

Salaries are commensurate with experience. Send resume with salary history/requirements to Professional Employment, Dept. BAR 72

Ford **Ford Aerospace & Communications Corporation**

Western Development Laboratories Division
3939 Fabian Way, Palo Alto, California 94303

An Equal Opportunity Employer M/F

PHILADELPHIA

SYSTEMS MANAGER TO $33,000

HEALTH INSURANCE SYS heavyweight to join PHILA area based NATL INSURANCE GIANT. Skillful ADMINISTRATOR w/superior MGMT SKILLS essential. Establish productive working atmosphere within growing dept. Lge scale IBM exp essential. Exp w/NATL HEALTH INSURANCE FIRM highly pfrd. Corp reorganization has created excel advancement potential.

We welcome company inquiries

This is a partial listing

For full details, please call for immediate interview appt or forward resume to our Recruitment Specialist, Wayne Robinson at,

ROBERT HALF PERSONNEL AGENCIES, INC.

Philadelphia, Inc.
2 Penn Ctr., Ste. 706
Philadelphia, PA 19102
(215) 568-4580

IDAHO

Banking Applications Programmer Burroughs B-2800 COBOL environment

Position requires experience in bank applications programming on Burroughs medium systems. On-line systems experience highly desirable.

Geographical area offers wide range of outdoor recreation opportunities. Near Yellowstone and Grand Teton National Parks.

Forward resume and salary history to
Banco, Inc.
1020 Lincoln Rd.
Idaho Falls, ID 83401

SR. SOFTWARE SPECIALIST

Pitney Bowes is a growth oriented leader in the design and manufacture of advanced business equipment and systems. We are currently seeking a technical support specialist with 2-3 years experience in UNIVAC 1100/22 and 1108 Systems; experience with EXEC-8, TIP, CMS, DMS, a definite plus.

Primary responsibilities include implementation and support of current levels of Operating Systems, Compilers, DBMS software, and Telecommunications software. Experience in technical programming and problem solving support for software intensive applications, especially DBMS and communications oriented systems is desirable.

If you are a career oriented individual with growth motivation, join Pitney Bowes, a progressive company where your accomplishments are recognized and rewarded. We are planning in the near future to upgrade our UNIVAC 1100/22 and 1108 to an 1100/82 System.

We offer an excellent salary and outstanding benefit package. For prompt consideration, please CALL COLLECT or forward your resume including salary history and requirements to:

STEVEN DIAZ
Professional Recruiting Specialist

Pitney Bowes
424 Washington Blvd.
Stamford, Conn. 06904
(203) 356-6560

An Equal Opportunity Employer M/F

strictly speaking - are you a decisionmaker?

If so, the special demands of our rapidly expanding computer design efforts requires your special talents... special people who thrive on innovative challenge... who want the chance to shape their own future... who are decisionmakers.

As a leading manufacturer and distributor of scientific lab instruments and distributor of office and laboratory equipment, we can offer uncommon, long range high visibility and growth potential and exposure to all levels of management. We are seeking the following career professionals:

SYSTEMS ANALYST

If you're a Systems Analyst with 3 years of systems applications and design experience who can assume project responsibility for designing of new and/or modifying existing systems, join our elite group of professionals. Generalized background in all business disciplines, a plus.

APPLICATIONS ANALYST/PROGRAMMER

Working with user department managers, candidate will identify problems and recommend modification of existing systems as well as design new systems for resolution of various company needs. To achieve these goals you will be using your experience in project and applications design. Minimum qualifications include proficiency in COBOL and thorough knowledge of DOS/VS and 2 4 years experience in applications design. Experience with DL/1, BAL, CICS, DBOMP and VM/370 helpful.

These positions offer the opportunity to develop new on-line capabilities using the latest hardware and software systems in the aggressive expansion of our 370/138 hardware. If you're a decisionmaker, expand your career horizon at Sargent-Welch! Forward resume reflecting experience and salary expectations to:

Personnel Manager, (312) 677-0600

SARGENT-WELCH
SCIENTIFIC COMPANY
7300 N. Linder, Skokie, IL 60077
An equal opportunity employer m/f

SCIENTIFIC & SYSTEMS PROGRAMMERS

Here's your opportunity to work with some of the most advanced computer facilities in the country

Two IBM 3033's interacting with over 250 remote terminals plus 40 mini computers serving specialized applications all help to to keep Pratt & Whitney Aircraft the leader in the jet engine field.

If you have 0–10 years in scientific and systems programming, and wish to broaden your experience, consider the opportunities in one of the following areas.

SCIENTIFIC PROGRAMMER/ANALYSTS

- Computer Aided Design Systems
- Engine Simulations
- Real Time Data Reduction
- Mini/Micro Applications

SYSTEMS PROGRAMMERS

- Real Time (BPM, CP6, NOS, EXEC 1100)
- Mini Computers (RSX-11M, RT-11, DOS, . . .)
- Time Sharing (VM/CMS)
- Batch/Transaction Processing (MVS/JES2/TSO)

A requirement is a B.S. degree in Computer Science, Mathematics, Engineering or related fields.

For immediate consideration, call 1-800-243-3342 toll free or send your resume (including salary history) to Professional Recruitment, Office 124, Pratt & Whitney Aircraft Group, East Hartford, Conn. 06108.

PRATT & WHITNEY AIRCRAFT GROUP
Commercial Products Division
UNITED TECHNOLOGIES
An Equal Opportunity Employer

TWO IBM 3033'S PLUS

PHILADELPHIA

FINL SYS CONSUL TO $37,000

FINL SYS expert from BIG 8 or BLUE CHIP firm will join mgmt team of foremost PHILA area SOFTWARE VENDOR. Skillful communicator must be capable of acting independently in a MKTG & SYS PLANNING SUPPORT capacity. Must be DEGREED, TECHNICALLY CURRENT w/extensive FINL SYS design & implementation exp. NO TRAVEL. Excel EXEC BENEFIT PKGE.

This is a partial listing

We welcome company inquiries

For full details, please call for immediate interview appt or forward resume to our Recruitment Specialist, Wayne Robinson at:

ROBERT HALF
PERSONNEL AGENCIES, INC.
Philadelphia, Inc.
2 Penn Center, Ste. 706
Philadelphia, PA. 19102
(215) 558-4580

HARDWARE SOFTWARE PLANNER

$30,000-No. Carolina

Our client, a leading EDP/Financial Service organization, due to continued growth, currently has oppty for EDP Planning professional. Resp will include all Hardware/Software evaluation & plng in relation to user needs. Client reqs person with strong "DOS" and "OS" software exp, in addition to latest state-of-art IBM hardware knowledge. Bkgd in mini-computers would be asset. Previous banking/insurance or financial industry exp is preferred. Excellent advancement, full career benefits. Client co pays all fees. For details contact J.K. Schwab at 704/375-P600 or send resume in complete conf to:

FOX-MORRIS
Personnel Consultants
1742 Southern National Center
Charlotte, NC 28202
EDP SPECIALISTS

SYSTEMS PROGRAMMER & PROGRAMMER ANALYST

Chloride, Inc. seeks a system programmer to be responsible for a DOS/VS, CICS/VS, VSAM System and to install a new IBM 3790/B100 Distributed Processing System using SDLC/VTAM.

We are also interviewing for an experienced programmer analyst to work in Inventory Control and General Accounting Applications. System design capabilities, CICS/VS and distributed processing skills are desirable. Excellent salary and fringe benefits. Send resume or call for confidential interview:

Chloride, Inc.
Personnel Dept.
P.O. Box 2459B
Tampa, FL 33623
(813) 870-3770
EOE M/F

$16,000 & up depending upon experience. REQUIRED: 3-5 years COBOL. PREFER: ANSI COBOL, Burroughs B1700/1800, Burroughs UPL-MCS, Banking Experience.

Northern Indiana Financial Service Corporation (NIFSCO) provides D.P. services to banks. We have a country type living in a small midwest city, but with an opportunity to learn and a challenge to produce. Programming done on-line. Send resume, salary history, and references to:

STEPHEN TROYER
NIFSCO
PO Box 967
Marion, IN 46952
(317) 668-8921

SYSTEMS ANALYST/ PROGRAMMER

Knowledge NCR NEAT/3 CIF-FOCIS NCR 8570 Criterion Computer. Computer Science degree plus 3-5 years experience with NCR CIF & FOCIS. Develop and maintain systems and oversee programming staff of three. Excellent opportunity with banking institution. Outstanding benefits. Send resume to:

Personnel Office
P.O. Box 1512
Lexington, KY 40591
Equal Opportunity Employer

PROGRAMMERS
Denver

Martin Marietta Data Systems offers superior opportunities in the systems programming area for individuals with a minimum of 3 years experience on CDC 6000 and Cyber Computers. Knowledge of CP and PP COMPASS assembly language a necessity. Positions involve systems support of a 6500 and Cyber 172 running the NOS/HE operating systems.

We also have opportunities for individuals with a teleprocessing Hardware/Software background. Knowledge of Assembly and Fortran languages a necessity. A knowledge of CDC, NOS/BE - MOD COMP, and INTERCOM desirable.

Martin Marietta provides excellent fringe benefits. Send your resume, including salary history, in confidence to: Marvin Crandall, Manager, Human Resources.

MARTIN MARIETTA

MARTIN MARIETTA DATA SYSTEMS
3900 South Wadsworth
Mail #D 4001
Lakewood, Colo. 80235
An equal opportunity employer m/f

FLORIDA POWER CORPORATION
FLORIDA WEST COAST
(IBM SYSTEM 370 MODEL 158 - OS/VS2)

Immediate openings in business applications with career advancement opportunities. Beautiful Florida Suncoast, excellent benefits.

SENIOR APPLICATIONS ANALYST

Minimum of seven years' experience in computer programming and five different applications required. Familiarity with computer modeling techniques desirable.

APPLICATION PROGRAMMER ANALYSTS

Two to five years' experience in computer programming and three different applications required. COBOL, TSO, CICS and IBM-OS JCL. Lexicon desirable.

Submit resumes and salary requirements to

Florida Power Corporation
Box 14042
St. Petersburg, Florida 33713
EMPLOYMENT SUPERVISOR
MICHAEL S. REEDER

Florida Power
CORPORATION

AN EQUAL OPPORTUNITY EMPLOYER

CADILLAC EDP OPPORTUNITIES

CADILLAC offers you assistance in finding a position that meets your objectives . . . NATIONWIDE or in your present locality. For 45 years CADILLAC has been helping professional people find new positions that offer greater growth, more responsibility, new experience, relocation, higher salary, etc . . . we'll make every effort to do the same for you. Just send your resume, or a note outlining your experience . . . no cost or obligation to you.

Sr Anal/Proj Mgrs	to $30	Mgrs S/3 RPG-11	to $27
Systems Anal	to $27	Scien/Mini Prog	to $24
Prog/Analysts	to $25	EDP Auditors	to $25
Programmers	to $22	System Prog/Tech Mgrs	to $32

NATIONWIDE--FEE PAID--CONFIDENTIAL

For more information, contact or send resume to:
Mark Fuller

CADILLAC ASSOCIATES, INC.
32 W. Randolph St., Chicago, IL 60601

Software Instructor

If you are an individual with applications programming (assembler) or real time systems experience on mini-to-medium computers, you have what we need. Knowledge of operating systems, computer hardware, communications and previous teaching experience is desirable. You will be involved in a wide variety of assignments which will focus primarily on the development and implementation of training courses for customer and in-house personnel in the areas of system generation and application programming techniques.

Hardware Instructor

For this position you need an in-depth knowledge of electronics and digital circuitry. Some exposure to assembly language programming and operating systems would be an asset. A minimum of one year classroom experience required. You will be responsible for handling instructional programs for field service and distributor representatives. Subject matter will include system flow, digital circuitry and maintenance techniques as well as system applications.

As a leader in the field of sophisticated distributed on-line data processing systems, we offer competitive starting salaries, plus participation in our comprehensive company paid benefits program. You will be based at our Trumbull, Connecticut facility; one of the most up-to-date in the industry, with easy accessibility to New York and Boston.

Please send your resume with salary history and requirements, indicating position desired, in strictest confidence, to: Mr. Peter Soligon, Bunker Ramo, Information Systems Division, Trumbull Industrial Park, Trumbull, Connecticut 06609. We are an equal opportunity employer/male and female.

BUNKER RAMO.

ENGINEERING PROGRAMMER

Help Develop Innovative Aircraft Monitoring Systems With

CONSYSE

Conrac Systems Software and Engineering

Apply your 3-5 or more years of experience with scientific languages (and exposure to top-down structural techniques) to sophisticated real time distributed microcomputer network projects. Ability to work with Engineering staff in formulating programs based on requirements is essential. You'll share CONRAC's impressive, consistent growth; enjoy excellent working conditions in an attractive suburban location, and the excitement of CONSYSE — Conrac System Software and Engineering. Please send resume with salary record data to: Ralph Holtermann.

CONRAC
Systems-East Division

CONRAC CORPORATION
32 FAIRFIELD PLACE
WEST CALOWELL
NEW JERSEY 07006

An Equal Opportunity Employer M/F

PROGRAMMER/ANALYST

Harris is a leading manufacturer of high capacity, offset printing presses for the publication and newspaper printing industry, and a division of a profitable, professionally managed corporation with an aggressive product development and diversification program.

New opportunities due to our rapid growth are presently available in data processing for programmer/analysts whose responsibilities will include applications in accounting, material requirement planning, order entry/billing, shop floor control and other areas. Your work will be primarily in new development in defining applications, designing and programming, and installing the applications with project leaders supervision.

Position requires a minimum of 3 years OS applications, with high proficiency in ANS and COBOL. Must have personally designed, programmed and installed a multi module medium to large scale OS application. Other helpful experience would include on-line transaction applications (CICS), interactive programming (VM/370), BOM, MRP, shop floor, costing, inventory, and structured designing and programming.

Competitive salary and comprehensive benefits are offered.

For confidential consideration please forward resume and salary requirements to: Harris Corporation, Web Press Division, Personnel Manager, Mechanic St., Pawcatuck CT 02891.

HARRIS
COMMUNICATIONS AND INFORMATION HANDLING

An Equal Opportunity Employer—Male and Female

The world's leading manufacturer of computer peripheral equipment has openings in our new Systems Division. We need experienced professional, innovative individuals who understand the need for discipline and standards in a complex development effort. The continual growth of our company and our products will provide a rare opportunity for your professional challenge and growth.

HARDWARE DEVELOPMENT MANAGER

Experienced IBM/370 compatible peripheral equipment hardware design and development engineer with management and administrative skills to supervise the development of complex hardware products for the Systems Division from concept through manufacturing release. Will report to the Director of Systems Development. MS/BSEE/CS or equivalent degree with proven management background.

HARDWARE ARCHITECT

You will have the opportunity to play a leading role in defining the hardware/software/firmware interface for a complex data storage subsystem. Requirements include MS/BSEE, CS degree or equivalent with digital logic hardware emphasis and 5 years experience in the design and implementation of multi-micro or multi-mini processor applications. Experience with hardware/software trade-off analysis and interface specification writing is also required.

DIAGNOSTIC DEVELOPER

You will design and implement functional diagnostic software and validate the operation of hardware/firmware software during production and in the field.

Requirements include a working knowledge of digital computer hardware, proficiency in assembly and higher level programming languages and original thinking ability to find loopholes in apparently sound logical systems. Other requirements include several years in software diagnostics development for processors or complex systems and a MS/BSEE or CS degree or equivalent.

DIAGNOSTIC MANAGER

You will be responsible for directing the activities of several software and firmware diagnostics developers and for product quality assurance within the development group. The position requires management experience over highly specialized professional employees in hardware, software or firmware development, demonstrated competence in diagnosing digital computer hardware and firmware faults and an MS/BSEE, CS degree or equivalent.

OPERATING SYSTEMS DEVELOPER

You will be responsible for the design and development of high performance machine dependent software for the Systems' Division innovative hierarchical data storage and management system. Background requirements include an MS/BS in Computer Science or EE degree and 5 or more years of experience related to operating systems development on large computer peripheral equipment.

STC offers a liberal benefits package including a stock purchase plan and profit sharing. If you would like to investigate our professional challenges, phone 1-800-525-2940 Ext. 7403, or send your resume in complete confidence to:

Dick Shinn
Professional Placement, Dept. CW/1106

STORAGE TECHNOLOGY CORPORATION
2270 South 88th Street, Louisville, Colorado 80027

STC

We are an equal opportunity employer M/F

Pacific Northwest Technology Manager

The City of Seattle is seeking a creative computer professional for a challenging role in the City's central data processing organization. The City's multivendor computer center, with a budget in excess of $4,000,000, is dominated by a 2 MB Univac 90/80 running under VS/9 - one of the largest 90/80 installations in the U.S. Other hardware applications include minicomputers, RJE, interactive programming, COM, OCR and distributed processing. Software applications include utility billing, engineering, general government, law enforcement, geoprocessing and a wide range of business applications in both a batch and real-time environment.

As a member of the City's central data processing authority, the Technology Manager will supervise a staff of professionals responsible for customer support and the installation and maintenance of data communications, DBMS and operating system software.

The successful candidate will have 10 years experience in data processing with a minimum of 5 years as a project leader in a software support group; 3 years as Systems Programming Manager in a large scale IBM or Univac environment is preferred. The Selection Committee will look for practical experience in the following areas:

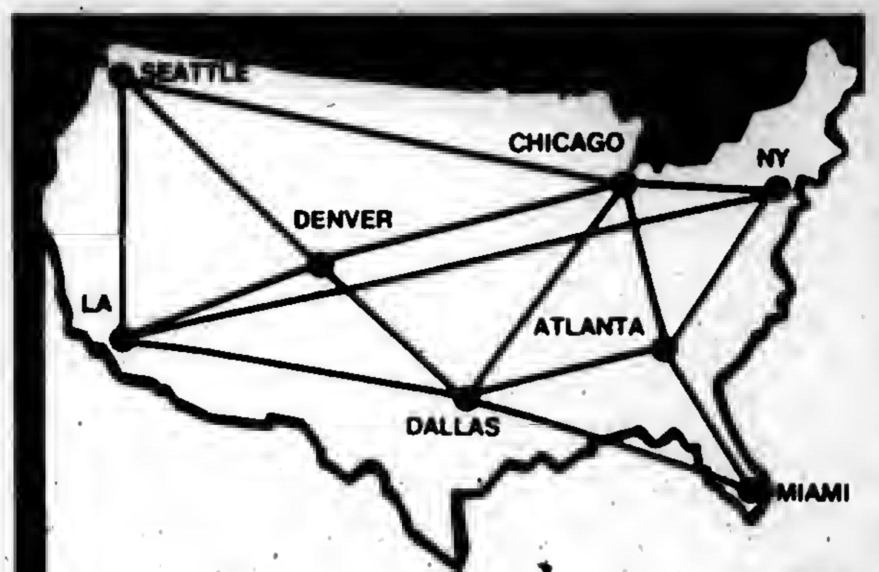
- **Data communications network planning**
- **RFP and benchmark preparation**
- **Project planning and scheduling**
- **Hardware capacity planning and performance measurement**
- **Technical procedure writing**
- **On-line real time systems development**
- **OS and data communications software maintenance**

The City offers competitive salary and an excellent benefit package including medical and dental coverage. Seattle is the cultural hub of the Pacific Northwest, an area that offers unlimited recreational opportunities.

Interested applicants are encouraged to send a letter of application, including resume, salary history and three letters of recommendation by November 23, 1978 to:

City of Seattle
OMB/MIS
700 City Light Building
1015 Third Avenue
Seattle, Wa. 98104
Attn: John Brandon

AN EQUAL OPPORTUNITY EMPLOYER



"So you've heard about Virtual Circuit Data Networks...

.Here's your opportunity to get involved in one."

AT ISD, TELEPROCESSING IS OUR LIFELINE!

IBM 3033, MVS, TSO, CICS, and so on. We've got it all. Most important, we're successful at it!

During November we'll be open for telephone interviews on Saturdays (9-2) and Mon. - Wed. evenings until 7:30 PM, in addition to normal business hours. We are looking for top systems professionals for the following openings:

- Network Analysts/Programmers
- BAL Programmer Analysts
- Operations (OS) Specialists
- System Programmers
- Project Leaders
- Operations Supervisors
  Network & Production Control

To qualify you should have expertise in one or more of the following:

- Teleprocessing Systems
- Minicomputer Operating Systems
- Large scale IBM systems/applications

For more information, call
Russ Hauth at 714/937-2236

TRW *Information Services*

505 City Parkway West, P.O. Box 6230
Orange, CA 92668 (714) 937-2487

We are an equal opportunity employer M/F/H

OPERATIONS CAREER OPPORTUNITIES

Due to recent reorganization of operations section of department, the following career opportunities are now available.

MANAGER OF COMPUTER OPERATIONS-Manage all activities of the computer operations, control and scheduling staff as well as maintain liaison with user departments to provide smooth production flow. Associate degree or equivalent combination of education and experience is required.

ASSISTANT MANAGER OF CONTROL AND SCHEDULING-Supervise day to day activities of control and scheduling staff. Considerable knowledge of computer operations and JCL is required.

Current hardware is IBM 370/158 using OS/SVS with TSO and large TP network using CICS and DMS.

Excellent benefit package, a professional work environment and salaries commensurate with experience and education.

Submit resume by November 17, 1978, to personnel office, 110 Nisbet Building, Michigan State University, East Lansing, MI 48824. An Equal Opportunity Employer.

EDP - SYSTEMS CONSULTING

Detroit based Big 8 Accounting firm is seeking systems orientated individuals to join our consulting staff.

The position requires a minimum of 2 years of programmer/analyst work experience and a functional knowledge of any of the following areas:

- Material and Manufacturing Systems
- Cost Systems
- General Ledger and Financial Reporting Systems

Technical undergraduate degree and advanced degree is preferred.

CW
Box 1753
797 Washington St.
Newton, Ma. 02160

EEO/Affirmative Action Employer

PROGRAMMERS

National Service Corporation is seeking Sr. Programmers with 5 yrs. exp. on any of the following large scale hardware: IBM 370/158 or /168 IMS & CICS Honeywell 6600 TDS & IOS Univac 1108 Exec 8 TIP & DMS. Salary to 24K + Bonus + B'nfts

ROBERT HALF
PERSONNEL AGENCIES, INC.

217 The Quadrangle
Balt., Md.
(301) 323-7770
7316 Wisconsin Ave.
Wash., D.C.
(301) 652-1960

PENNSYLVANIA

**Eastern and Central Pa.
Programming Openings**

Computer professionals needed at all levels. Our client companies assume our fees. Please send resume or letter of application: include desired salary and geographic location. PH (717) 346-2233, Datasearch Consultants, Bank Towers Bldg., Wyoming Ave., and Spruce St., Scranton, Pa. 18503.

SYSTEMS PROFESSIONALS NATIONWIDE SERVICE

Dir MIS To $45K
Midwest Div Mfg/Hdq Mfg/Fab exp.

Fincl Sys Mgr To $34K
Corp Hdq, Fincl/Acct IBM, Degree

Proj Mgr To $30K
Commercial, Tech Bkgd Fincl/Mrkt/Mfg Degree a +

F-O-R-T-U-N-E DATA

DIV FORTUNE
PERSONNEL AGENCY
505 5th Ave. NYC 10017
(212) 682-8600
Company inquiries invited

CENTRAL FLORIDA

RESEARCH ENGR: Data Compression MS or PhD EE. Multi-Nat'l corp—40K+

STAFF ENGR: Monolithic IC apps. in telecomm. MSEE. Lead R&D—33K

STAFF ENGR: PDP Assembly, real-time/telephony applications—30K

DESIGN ENGR: Lead project group in MicroP and logic design—30K

DESIGN ENGR: Hardware, MicroP + interfaces. Simulators—28K

SOFT DESIGN: BSEE or CS maint. and diag. design. Telephony—27K

ANALYST: Strong hard/soft Telecomm exp. Leading mfgr.—26K

PROGRAMMER: 3 yrs. Scientific software/minis. High Growth—26K

TECH SUPPORT: PDP/Assembly, Fortran. High visibility—24K

ANALYST: DOS & Terminal Interface. Upward mobility. S&L—20K

PROGRAMMER: BSCS. CICS, TOTAL, IDMS. Manufacturing—19K

ENGINEER II: Entry level software support. PDP Assembly—17K

Contact: Technical
Recruiting Dept.
C/M of Orlando
3101 Maguire Blvd.
Orlando, Fla 32803
(305) 894-6551

Programmer

SYSTEM ANALYSTS

Information International, the leader in computerized illustrated typesetting technology, in Culver City, is currently staffing career positions for Marketing Support Analysts. Position responsibilities include the definition of new products, technical support for Marketing, proposal preparation, and interfacing with prospective customers to define system specifications. Candidates should have the ability to write clearly, knowledge of the Graphic Arts industry, experience with mini-computer systems, and a degree in related fields.

Excellent benefits and working conditions. Send resume and salary history in confidence to:

M.F. McCurdy
INFORMATION INTERNATIONAL
5933 Slauson Ave.
Culver City, CA. 90230

Equal Opportunity Employer M/F

PROGRAMMER/ANALYSTS

SALARIES $17K-$30K

Here's an outstanding opportunity to significantly advance your career designing State-Of-The-Art Systems while gaining above average compensation for your efforts by joining a fast growing, highly professional consulting firm with contracts in the Washington D.C. and Richmond areas. The Sands Corp. has immediate openings for Jr. and Sr. level Programmer/Analysts with a minimum of 3 yrs. experience, who possess the following qualifications and capabilities.

- In depth experience using IBM OS and MVS systems with expertise in JCL and IBM utilities.
- High proficiency in COBOL; other languages very desirable.
- Demonstrated Writing and Communication skills.
- Proven abilities in all levels of Systems Analysis, Design and Implementation.
- Capability to take direction as well as work independently on assigned tasks.

Previous experience with ON-LINE Processing, IMS, Software Package Evaluation, or Project Management Systems is highly desirable. Applicants who meet the above requirements will be provided a unique opportunity to join a highly competent staff of data processing professionals who enjoy.

- 4 DAY WORK WEEKS
- PAID OVERTIME
- A MONTHLY CASH BONUS IN ADDITION TO BASE SALARY
- GENEROUS FRINGE BENEFITS PACKAGE

If you are an aggressive, highly motivated individual who would like an opportunity to truly receive recognition and immediate compensation for superior effort send your resume and salary history to:

THE SANDS CORP.

10305 Conejo Lane
Oakton, Virginia 22124

An Equal Opportunity Employer M/F

Sales

FIELD SALES REPRESENTATIVES

Microsystems Division, a division of **Pertec Computer Corporation**, and a leader in the microcomputer field, has sales positions available in our Eastern and Central regions. Responsibilities include selling to and managing an independent network of distributors that market PCC's microcomputer to small businesses who are first time end users. This involves sales training, seminars, direct and user contact and complete sales support to the distributor. Requires a thorough knowledge of small business systems and their problems. Previous end user computer and/or software sales experience necessary. Reports to regional sales manager.

PCC employees receive an excellent benefit package, including life, medical, dental, long term disability insurance, stock purchase plan, savings/retirement plan, tuition refund, a liberal relocation plan, and up to 25½ paid days off per year. Interested and qualified candidates are invited to submit their resume with salary history to:

Personnel Department

PCC PERTEC COMPUTER CORPORATION
MICROSYSTEMS DIVISION
20630 Nordhoff
Chatsworth, California 91311

Equal Opportunity Employer M/F

SYSTEMS PROGRAMMER

*** San Diego ***

General Atomic Company is proud of its technological achievements and its broad spectrum of programs in the increasingly important energy field. We think you'll enjoy working in the stimulating and challenging environment of GA.

We're seeking a Systems Programmer with experience in implementing and maintaining UNIVAC 1100 (EXEC 8) operating systems software. Successful candidate will be made responsible for implementing, enhancing and maintaining DMS-1100, COBOL, QLP and other related data base software on a large UNIVAC 1100 with multiple data base applications.

Please submit your resume to Manager of Employment, Dept CW 101, P.O. Box 81608, San Diego, CA 92138. We are an equal opportunity employer M/F/H.

General Automic Company

TECHNICAL WRITING PROFESSIONALS

Creative Opportunities
Professional Growth
Challenging Assignments

Control Data Corporation's Publications and Graphics Division offers exciting opportunities for hardware and software writers with various backgrounds and levels of experience. Openings exist at several locations in the U.S. and Canada.

SOFTWARE WRITERS: Join our technically challenging environment documenting state-of-the-art software. You will prepare user manuals supporting Control Data's software product line, including operating systems, applications products, network communications, ALGOL, COBOL, FORTRAN, PL1, and Data Management languages. Ideal candidates will have a Bachelor of Science degree in computer science and some writing experience, or a combination of equivalent technical skills and education.

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Specialty ☐ Hardware ☐ Software

Present Employer ____________ Years Experience ______

Software Languages ____________ Hardware Exp ____________

Operating Systems Experience ____________________

Preferred Location(s) (Check one or more)

☐ Arlington, VA
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☐ Anaheim, CA
☐ San Diego, CA
☐ Sunnyvale, CA

To find out more details about YOUR opportunities, submit your resume, a letter summarizing your qualifications, or this coupon to J.W. Lewis, Control Data Corporation, P.O. Box 0 (HQN03T), Minneapolis, MN 55440. You are assured of a personal, confidential reply. You may also call TOLL FREE 24 hours a day (1-800-821-7700 extension 606).

CW

CONTROL DATA CORPORATION

An Affirmative Action Employer M/F

Brown & Root, Inc.

Brown & Root, the nations largest engineering and construction firm has immediate openings in Houston for Systems Projects Managers, Systems Analysts, Programmer/Analysts and Programmers with three or more year's experience. The Computer Services Department is expanding to support large scale information system requirements including:

- **Materials Management**
- **Personnel/Payroll**
- **Financial Reporting/Systems**
- **Project Cost Accounting**
- **Scheduling**
- **Estimating**
- **And Other Applications**

Data Processing professionals with experience in any or all of the following areas are desired.

DBMS Application Design/Programming — Project Leadership and Management
On-Line Application Design/Programming — CPM/Pert Processors
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For the programming positions COBOL and IBM 370 experience is preferred

These positions provide excellent income commensurate with your experience, a generous benefit package, excellent location and outstanding opportunities for both professional achievement and personal growth within our organization.

Please send resume in complete confidence to:

Mr. T. E. Davis
P.O. Box 3, Houston, Texas 77001

Brown & Root, Inc.

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DATA PROCESSING PROFESSIONALS

COMTEN, INC., a computer engineering and manufacturing firm headquartered in the Minneapolis area, has embarked on the development of a corporate MIS function. With a 40% annual growth rate, new openings have been created at various levels, including:

* Data Base Administrator
* Systems Analysts
* Programmer/Analysts
* Programmers

These positions require experience with COBOL accounting and/or manufacturing applications. Knowledge of IBM 370, CICS, and TOTAL preferred.

Comten will reward your talents with excellent salary, benefits, and growth opportunities. As one of the fastest growing companies in the industry, we can enable you to develop your technical expertise. Send your resume today to Jane Christianson or call 800-328-9122:

COMTEN, INC.
1950 West County Road B2
St. Paul, Minnesota 55113

COMTEN

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We are an advanced development engineering company dedicated to solving todays data problems. We are currently involved in development areas that include:

* High and low speed modems
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* The full spectrum of data terminals

If you have hardware or software experience in any of the following areas . . . .

* microprocessor based system development
* Data communications
* Digital signal processing
* Digital system design
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. . . . we can offer you the opportunities to expand your professional horizons. We have in-house custom LSI development capabilities and unbounded opportunities of all levels of engineering in software development people.

For immediate and confidential consideration, call Rod Manning, collect at (305) 592-5996 or submit your resume in confidence to:

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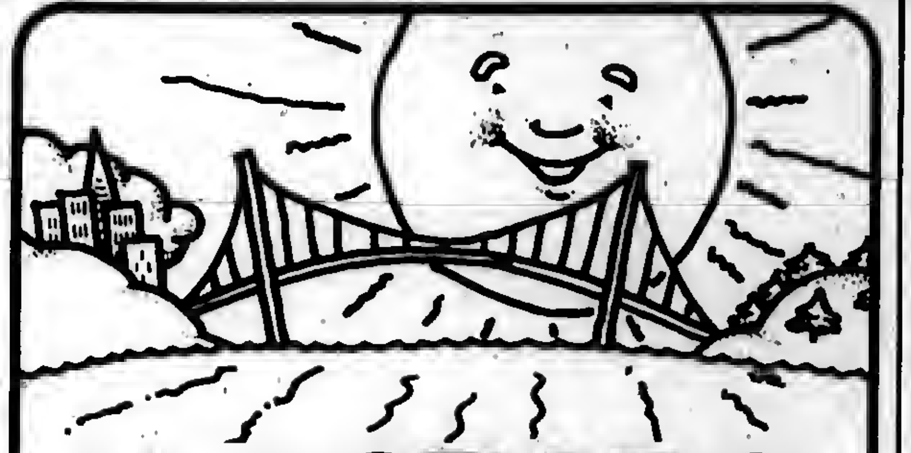

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In behalf of one of San Francisco's largest corporations, we, together with client technical supervisors, will be in Boston November 4 to 12 to interview top EDP professionals for numerous existing and projected positions with this highly sophisticated EDP user.

Our objectives include the filling of five new systems specialist and consulting positions, with salaries ranging from $22K to $28K. All are in-house assignments, responsible for product development from inception to implementation. Each involves the planning, organization and evaluation of systems for: Quality Assurance; Data Security; Proposal Evaluation; Standards & Documentation; and R&D. All provide variety, mobility, company-wide interface, and an excellent overview of all operations.

These are top technology situations, with IMS Data Base, MVS Multiple Processor, Telecommunications, Structured Technique and Advanced Methodology.

In addition to technical skills and experience, applicants must have strong facility in written and verbal communications. Our client offers complete relocation and a top benefit package. For an appointment, call Mr. Bernstein collect at (415) 777-3900.

Employer Retained Career Placement Service.

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systems representative

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There's no better time to consider a major career move to Pansophic than right now! Escalating marketing success resulting directly from innovative new concepts in software technology has created the ideal career growth climate for the talented Systems Representative capable of keeping pace with our ambitious plans for the future.

This important liaison position between customers and sales calls for a professionally motivated individual who enjoys being mobile and dealing with people on a continuous basis as well as becoming actively involved with installation, implementation and customer instruction at system sites. Current openings are in Chicago, Dallas, San Francisco and McLean, Va.

This position calls for excellent communications skills, a thorough familiarity with OS/DOS, 2-3 years systems or application programming background, a knowledge of COBOL and/or BAL and on-line programming and/or data base knowledge. A good understanding of PANVALET, EASYTRIEVE and/or PANEXEC would be considered essential for success. Of utmost importance is the combination of well-defined career goals and a creative approach to problem-solving.

In addition to an excellent salary and benefits package, the selected candidate will receive indepth training in state-of-the-art software technology and open-ended opportunities for career growth. For consideration, send a resume to Tarie Yee, PANSOPHIC SYSTEMS, INC., 709 Enterprise Drive, Oak Brook, IL 60521, or

Call Collect (312) 986-6026

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Systems Analysis- Proj Ldr 370/158 DOS On line database pension retirement systems — $25-28K

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Financial Systems Anal proj ldr re-design fincl G/L, A/R — $25-27K

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Syst Prog-Proj ldr Conn loc 370/158 On line VM VS 2.— $24-31K

Prog Systems 32 RPG lrn 370/168 NYC loc-relocate to Southwest — $21K

Prog Anal Intl corp CICS DL 1 IMS MVS COBOL BAL degree — $27K

IMS Database designer DL 1 DC — $31K

IMS Software internals min 1 yr exp deg preferred — $21-27K

Fincl Systems Anal Fortran, BASIC MBA — $18-21K

Int'l Corp Systems 3 RPG 2 mod programmer. Learn 370 — $19-21K

PDP 10 or equiv COBOL Fortran PL1 exp. Masters deg pfd, prodn mgt syst — $25-27K

Fincl Systems Cnslnt Fortran BASIC — $27K

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Wall St-maj new development proj ldr P&S firm inventory — $32K

Financial Prog/anal Fortran PL 1 fixed income systems — $23-29K

Timesharing Analyst programmer options CMS OS PL1 Ramis — $21K

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PDP 11 Dibol Cobol RSTS-E design maj persnl syst — $25K

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William Harris Assoc
150 B'way agency NY 10038

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Please submit resume to:

MIT Personnel Office
400 Main Street
Cambridge, MA 02139
253-4250
Attn: Job No. C78-29

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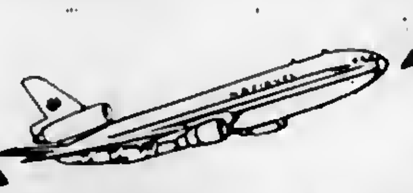

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ACP, support and on-line applications, minimum one year experience.

COBOL PROGRAMMER
IMS/VS-DC Applications. Minimum two years of programming experience.

OPERATIONS SUPERVISORS
Minimum five years experiance in a Large Scale IBM 360/370 OS/MVS/Tele-communications environment.

The above positions are newly created and located at our Miami Headquarters. Levels and salaries are commensurate with experience, and liberal travel and fringe benefits are available.

Send resume, including education and salary history to:

NATIONAL AIRLINES
Employment Office Department C
P.O. Box 592055, AMF
Miami, Florida 33159
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National Airlines

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JOIN THE CENTER THAT CENTERS AROUND THE 3033

Our full-service Data Center currently runs 2 of the new 3033's. We are seeking professionals who would like to become associated with one of the leading cost efficient computer utilities in the Western United States and to work with the newest and most sophisticated computers in the world. We are located in the West San Fernando Valley, away from traffic and congestion. MIC is just 30 miles from Los Angeles and 30 minutes from the Pacific Ocean.

We currently have openings
for the following professionals:

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Strong knowledge of JCL and MVT or MVS concepts. Programming skills in at least one of the following languages: PL/1, FORTRAN, APL or COBOL; assembler language skills; strong debugging skills and demonstrated ability to work with Data Center customers. TSO experience a plus.

PROGRAMMER ANALYSTS

Experience should include design, development, implementation and maintenance of information systems utilizing multiple IBM 168's operating under MVS with IMS, RJE and TSO facilities.

Should have 3-5 years of COBOL programming, preferably within IBM OS, VS, or MVS environments.

DATA BASE ADMINISTRATOR

3 to 4 years experience in IMS DB/DC environment, preferably as DBA or as a systems programmer in support of IMS DC Systems.

For Immediate consideration, please send your resume or write, including salary history, in confidence to:

Bob Bonney

Litton

LITTON MELLONICS
INFORMATION CENTER
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Canoga Park, Calif. 91303

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SYSTEMS PROGRAMMERS $31,000+

Expanding Mid-Atlantic Financial Co. seeks individuals to work at problem determination systems level. Electronics Fund Transfer, Message Switching, Telecommunications Network applications background ideal for this large, prominent IBM user. Sal. to $31,000+. Resume & Salary requirements to: Professional Search Personnal, MIS-EDP Dept., 4900 Leesburg Pike +311, Alexandria, VA. 22302. No contracts, No Fees to you.

$500

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We will pay you to change jobs!

$500 bonus paid for D.P.ers who change jobs through us. Four year degrees and at least two years with current employer required. Interview expenses and relocation generally paid. Send resume TODAY to: MS-48B, P.O. Box 42999, Houston, TX 77042.

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The Medical College of Wisconsin, located in suburban Milwaukee, is in the early stages of implementing a total hospital information system. We are looking for expereinced Data Processing Professionals in the health care field interested in a ground floor opportunity. The system when implemented will use state of the art hardware, data base and online programming techniques. We offer an exciting challenge, competitive salaries and excellent benefits.

SUPERVISOR OF HOSPITAL APPLICATIONS

Supervisor of systems and programming personnel. At least 3 years experience in hospital data processing environment required.

SENIOR SYSTEMS ANALYST

To define requirements for hospital systems. May work as project leader or independently. Hospital applications background required.

SENIOR ANALYST/PROGRAMMER

To implement online, data base patient care systems. Hospital applications background required.

Send a resume or call collect:

(414) 931-1042
MEDICAL COLLEGE OF WISCONSIN
Computer Center
1725 West Wisconsin Avenue
Milwaukee, Wisconsin 53223

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TOYOTA

Toyota, the nation's number one automobile importer has the following Programming positions available:

IMS DC Project Leader

Supervise a project group of IMS Support Systems Programmers and Systems Analysts. Responsibilities will include development and implementation of ground floor IMS DB/DC on-line systems including back-up, recovery and MTO operation for IBM 158 AP and 3033. Interface with user management combined with personal technical involvement makes this a rewarding and stimulating position. Requires prior DB/DC system experience and supervisory ability; degree preferred.

IMS Technical Specialist

Responsible for establishing and monitoring the DB/DC test, and production environment. Develop and support MFS, BTS, and other test tools. Monitor systems performance and efficiency. Requires previous IMS systems programming experience in on-line environment. Degree preferred.

Toyota offers comprehensive company paid benefits including medical/dental coverage, in an attractive Southern California location. Our software is State-of-the-Art (MVS, JES 2, VTAM, NCP, and IMS DB/DC) and our plans are aggressively growth oriented. (IBM 3033 to be added January 1979).

For immediate consideration, please forward resume with salary history to:

John R. Freeman

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2055 W 190th St. Torrance, Calif 90504
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Our client, a leading textile manufacturer, is establishing a data processing department in the beautiful Shenandoah Valley of Virginia. This is an opportunity to get in on the ground floor with a blue chip company. Listed below is a sampling of available positions:

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SYSTEMS/ANALYST (Retail) $25,000
PROGRAMMER/ANALYST (Head Type) $22,000
PROGRAMMER/ANALYST (DOS/OS-Payroll) $21,000
PROGRAMMERS (2) (DOS/OS-COBOL) $19,000
SYSTEMS PROGRAMMER (CICS, DL/1) $25,000
PROGRAMMER/ANALYST (Data Base) $21,000
PROGRAMMER (CICS, DL/1) $21,000
PROGRAMMERS (2) (DOS/OS) $16,000+
COMPUTER OPERATOR-LEAD (DOS/OS-Power) $14,000
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TECHNICAL WRITER — DP $35,000
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SR. PROGRAMMER (Financial) $21,000
PROGRAMMER (COBOL-Assembler) $16,500
PROGRAMMER (OS Shop-New "spot") $16,000

Call (804) 288-1159
or send resume
in complete confidence to
H.J. Sledd,
D.P.M.E.,
115 S. Willow
Lawn Mall,
Richmond, Viginia 23230.

Compiler Development
High Level Language Design

We have an immediate opening for a person with interest and experience in compiler design and development for high level languages. Design of a retargetable, portable compiler offers a challenge to a computer professional with a background in programming language translation.

Located near Portland, Oregon we are within a two hour drive of the Cascade Mountains and Ocean Beaches. The close-by natural playgrounds and the City of Portland provide a variety of recreational and cultural interests.

Salary is open. Benefits include educational support, insurance and profit sharing programs.

Send detailed resume and salary history to Mary Walhood, TEKTRONIX, INC., P.O. Box 500, W23, Beaverton, Oregon 97077.

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Tektronix
COMMITTED TO EXCELLENCE

DATA PROCESSING MANAGER

Unusual opportunity in Chicago West Suburban area for a Data Processing Manager with mini computer experience.

We are a rapidly expanding Midwest retailer who is in need of a DP pro to establish a data processing department. The DP Manager will be able to evaluate hardware, design systems and interface with all levels of management. The individual will be responsible for the recruitment of 2 to 3 professionals as the department develops.

The successful candidate will have a combination of four (4) years or more operational management and data processing experience in systems, operations (including scheduling, planning and design) and programming in a mini computer environment. The individual should be knowledgable in financial systems, inventory control and POS.

We offer an excellent compensation and fringe benefit program for the qualified professional.

For local interviews, send resume and salary history to:

Controller
P.O. Box 922
Oak Brook, IL 60521

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Applications programmer, Systems Engineer, H-6000 or L/66, GCOS/COBOL/GMAP IDS TPE/MULTICS, US firm has 18-24 mo tours w/fam. Ex financial pkg in Tehran. Ski 1 hr fm office. Rush resume: Cybermetrics Corp., P.O. Box 579, McLean, VA 22101. (703) 356-1997. Other positions avail.

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Whether your expertise is Prog, Sys Design, or D.P. Mgmt we can put you in touch with the D.P. Market in the Pacific N.W. Send resume or call: 503-224-9575. 811 S.W. 6th Suite 710, Portland, Ore. 97204. OR: 206-623-6790 2200 6th Ave, Suite 1200 Seattle, WA 98121.

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Our engineering Development Group has the prime responsibility for both the development and engineering of state-of-the-art product ideas. Their efforts play a large part in continuing our position as a world leader in Process Management and Control Systems. This is an extremely challenging area offering good personal visibility plus an opportunity for technical expression that may be lacking in your present position.

You will implement input/output drivers, communications and console handling programs for new microprocessor-based man/machine interfaces. You will also take part in software development — specifying, designing, documenting, coding and integrating programs. Possible future assignments include application of microprocessors to further new products in the Systems Software Development Department.

You must have a BS in Computer Science, Mathematics or Physical Sciences with two years in real time, assembly language programming, and 8085 microprocessor programming experience desirable. Knowledge of operating systems and complex data structures required.

Forward resume, including salary requirements to Mika Boyd, Dept. 116-CW, The Foxboro Company; 38 Neponset Ave., Foxboro, MA 02035. Foxboro is an equal opportunity employer, M/F.

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We offer Computer services to member hospitals. Such services include patient accounting, Lab Reporting, payroll, etc.

The Marketing Manager is responsible for maintaining existing accounts and developing and expanding our Market area.

The skills required for this position are:

- Interfacing with top management
- Must be goal and achievement oriented
- Demonstrated written and oral communication abilities
- Promotion or sale of intangibles preferred
- Managing subordinates or work history indicating skills in leadership, initiative, planning and organizing
- Understanding of accounting and basic familiarity with EDP desired but not required

Please be sure your resume specifies what you did in your past positions and what you accomplished.

Top notch fringe benefit package offered. Salary commensurate with experience. St. Peul, Mpls suburban location. Please forward resume to:

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Nawton, MA 02160

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The location is Southwest Sunbelt . . .

A newly created management position has been established within a high prestige development organization.

Our client is seeking a disciplined professional to head up a Software Quality Assurance Group. Responsibilities include participation in new product design with special emphasis on formal planning and coordination of test activities. Ongoing involvement in product support and enhancement will provide the opportunity for overall product quality control.

The ideal candidate will have first level supervisory experience, and a background in real time systems development and testing, preferably in telephone applications. A career interest in the development of reliable, high quality mini-micro based products is the primary requirement.

A prompt, personal acknowledgement will be given when you send your resume or call collect.

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EDP PROJECT LEADER for established manufacturing firm in desirable suburban location. Good opportunity for someone with systems, to $25K, fee paid.

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Cincinnati, DH 45206

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The combination of all the things you work for and long-term growth opportunity are offered by our client, a major manufacturer of industrial, commercial and consumer products located in a friendly northwestern Pennsylvania city. The area is rich in potential for the good life, while the living cost is modest compared to most metropolitan centers. And to top it all, salaries are above average enhanced by benefits that add up to real family security:

LEAD SYSTEMS ANALYST
Must be good organizer, good communicator with systems design and project management experience. Manufacturing background desired for strong performance in financial applications using ANS COBOL in an IBM 370 OS/VS IMS environment. Degree in Math, Business or Engineering required. MBA desirable.

SENIOR APPLICATIONS PROGRAMMER
Needs good technical abilities to provide program design, coding and testing on large-scale accounting/financial applications in a manufacturing environment. Must be experienced in 370 OS/VS IMS using ANS COBOL. Degree in Business, Math or Engineering desirable.

PROGRAMMER ANALYST
To assume responsibility for payroll and personnel related projects. Needs background in MSA payroll and experience in financial/accounting applications using ANS COBOL on IBM 370 under OS/VS IMS. Must have structure design and programming experience. Degree in Math, Business or Engineering required.

For immediate action, CALL COLLECT:

Contact Ms. Hercourt
Call Mon-Fri, 9am-5pm
(212) 683-6171

or if you prefer, send your resume to:
Dept. 419, 101 Park Ave. New York, N.Y. 10017

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These positions range from Member of the Technical Staff to Senior Scientist with salaries to $35,000.

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Requires 3-5 years experience working with large-scale state-of-the-art systems control programs, including 1-3 of those years working with CICS/VS or similar teleprocessing monitors. Must have thorough knowledge of Assembler, IBM systems utilities and JCL; TSO a definite plus. You'll be involved with software services to teleprocessing monitors including CICS/VS will maintain, modify CICS/VS modules, internal tables, and implement new software.

SR. SYSTEMS PROGRAMMER

Requires Bachelor's Degree, or equivalent, in Computer Science, 2-3 years experience in systems generation/maintenance of IBM MVS/JES2 operating system. Must also have background in evaluation and installation and maintenance of computer software and experience in high level languages or Assembler. Will be involved in system generation, and testing of MVS/JES2 system including evaluation, installation and maintenance of computer software such as retrieval languages, data base, compiler, etc.

Contact us if your background and interests match ours. Send resume with salary history to Mr. F. Mieso,

MERCK & CO., INC.
P.O. Box 2000 Rahway, New Jersey 07065
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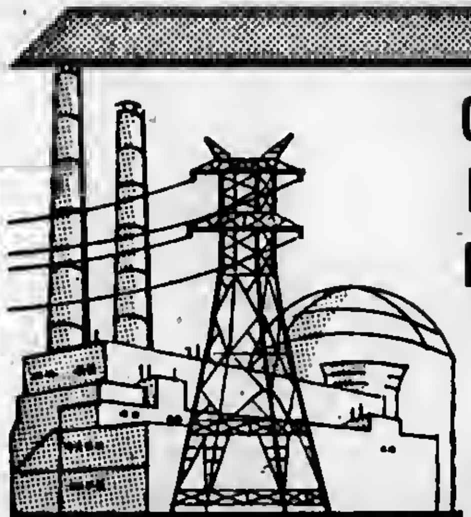

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We have openings for experienced individuals who have a proven track record in large applications systems using advanced IBM 370 hardware and software technology. If you desire to help us ready for the 1980's, if you produce quality systems on time, within budget, within specifications, you may like the challenges.

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We need an experienced person in business methods and procedures to assume a responsible position in our Management Information Systems Group. Responsibilities will include Methods, Procedure Writing, and Field Training. Applicants should have five or more years of experience in methods work and procedure writing for computerized businesss systems. A proven leadership record with verbal and written communication skills in a demanding environment is essential.

Please apply in writing with educational, employment and salary requirements to:

Mrs. Linda M. Heidenis

NORTHEAST UTILITIES

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Knowledge of foreground/background
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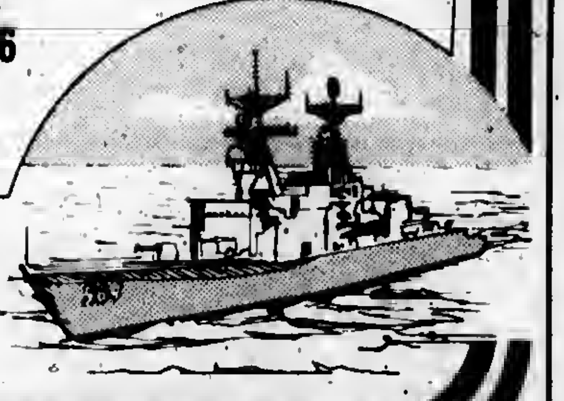

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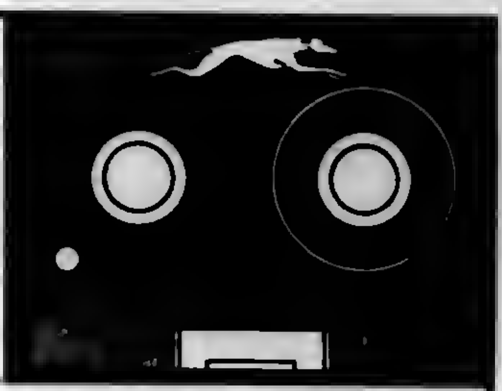

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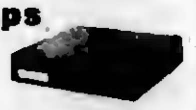
4800 bps 	**MODEM 4500/48** Automatic equalization unconditioned dedicated dial lines. Optional dual 2400 bps operation on dedicated lines.	$4980 $100/mo.*	**$1795** **$72/mo.***
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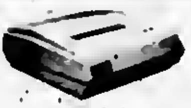
Printer 	**BRAND NEW 40 + 10 PRINTER** Desk top printer. Produces 80 columns of 5 x 7 dot matrix character at 110 CPS or 70 lines per minute. Parallel Interface—3 month warranty.	$1650 Purchase only	**$595** **Purchase only**

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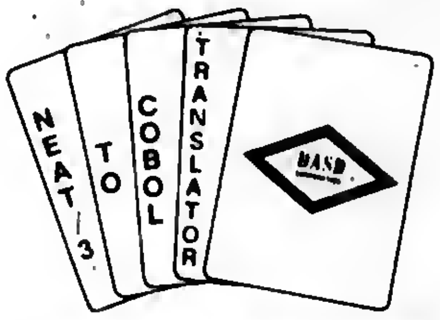

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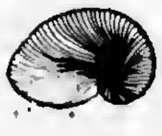

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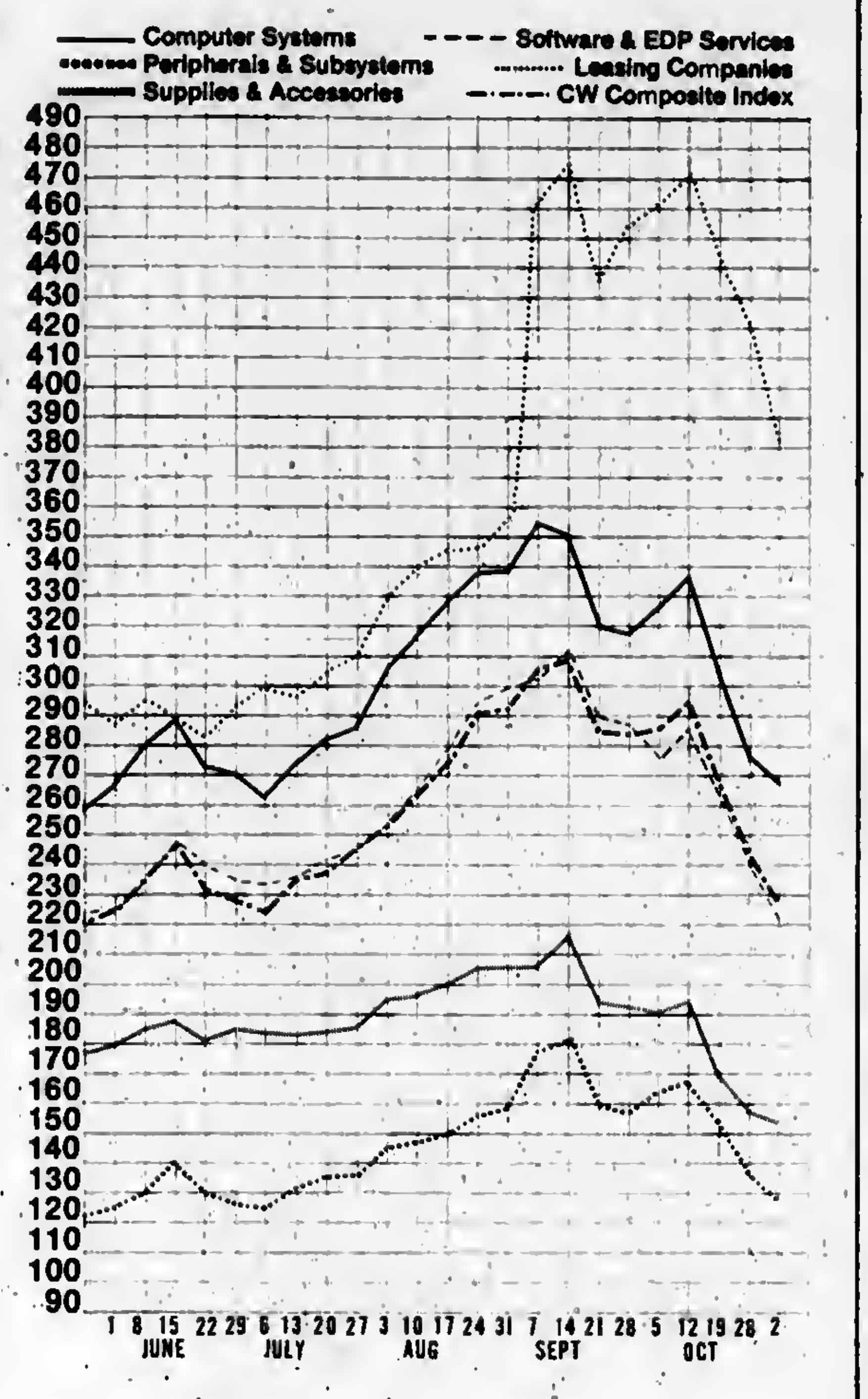

Earnings Reports

ADVANCED COMPUTER TECHNOLOGY
Year Ended March 31

	1978	1977
Shr Ernd	$.05	$.11
Revenue	15,104,296	11,884,885
Earnings	82,050	142,872

AMPEX
Three Months Ended July 29

	1978	1977
Shr Ernd	$.49	$.41
Revenue	87,171,000	70,774,000
Tax Cred	2,068,000	1,890,000
Earnings	5,809,000	4,522,000

COMPUDYNE
Three Months Ended June 30

	1978	1977
Shr Ernd	$.05	$.17
Revenue	11,945,770	11,071,873
Disc Op	....	551,988
Earnings	190,711	579,281
9 Mo Shr	.04	.32
Revenue	34,210,824	32,444,549
Disc Op	....	653,605
Tax Cred	....	50,093
Earnings	253,916	1,157,189

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RECOGNITION EQUIPMENT
Three Months Ended July 31

	1978	1977
Shr Ernd	$.24	$.26
Revenue	23,000,000	19,400,000
Tax Cred	300,000	500,000
Earnings	1,400,000	1,500,000
9 Mo Shr	.71	.88
Revenue	83,700,000	54,900,000
Tax Cred	900,000	2,200,000
Earnings	4,200,000	5,200,000

DYNASCAN
Nine Months Ended Sept. 30

	1978	1977
Shr Ernd	$.82	a$.14
Revenue	50,037,000	68,095,000
Earnings	2,413,000	407,000
3 Mo Shr	.30	.....
Revenue	17,482,000	12,432,000
Earnings	875,000	(682,000)

a-Reflects a 3% stock dividend paid in January and June 1978

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOVEMBER 1, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE			
		1978 RANGE 111	CLOSE NOV 1 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	44 1/2	+ 3/4	+1.7
N	BURROUGHS CORP	59- 87	74 5/8	+3 3/8	+4.7
O	COMPUTER AUTOMATION	15- 44	18	-1 1/2	-7.6
N	CONTROL DATA CORP	23- 44	34 1/8	+1 5/8	+5.0
O	CRAY RESEARCH INC	21- 74	53	0	0.0
N	DATA GENERAL CORP	42- 71	59 1/2	+2 1/8	+3.7
N	DATAPOINT CORP	34- 75	55 3/4	+3 1/4	+6.1
N	DIGITAL EQUIPMENT	39- 54	49 3/4	+3 3/4	+8.1
N	ELECTRONIC ASSOC.	2- 13	7 1/8	-1 1/4	-14.9
A	ELECTRONIC ENGINEER.	10- 19	10 1/8	-2 1/4	-18.1
N	FOUR-PHASE SYSTEMS	19- 46	28 5/8	-2	-6.5
N	FOXBORO	28- 40	33 1/4	- 1/2	-1.4
O	GENERAL AUTOMATION	7- 26	14 1/2	0	0.0
O	GRI COMPUTER CORP	1- 3	1 1/8	- 3/8	-25.0
N	HEWLETT-PACKARD CO	62- 93	84 3/4	+4 3/4	+5.9
N	HONEYWELL INC	43- 72	63 5/8	+1 3/8	+2.2
N	IBM	236-305	276 1/8	+2 3/8	+0.8
O	MANAGEMENT ASSIST	9- 29	15 1/2	-1 5/8	-9.4
O	MICRODATA CORP	10- 23	12 1/8	-2 3/4	-18.4
O	MINI-COMPUTER SYST	4- 8	5	- 3/4	-13.0
O	MODULAR COMPUTER SYS	7- 17	9 1/2	-1	-9.5
N	NCR	37- 67	61	- 5/8	-1.0
N	PRIME COMPUTER INC	20- 43	27 1/2	-1 3/4	-5.9
N	PERKIN-ELMER	17- 28	23 1/4	+1 1/8	+5.0
N	RAYTHEON CO	29- 58	47 1/2	+1 1/4	+2.7
N	SPERRY RAND	33- 49	42 7/8	+ 3/4	+1.7
A	SYSTEMS ENG. LABS	11- 24	13 1/4	-1 1/4	-8.6
A	WANG LABS.	12- 32	22 1/4	- 3/4	-3.2

LEASING COMPANIES

EXCH		1978 RANGE 111	CLOSE NOV 1 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	13- 21	16 3/4	-1 3/4	-9.4
O	COMDISCO INC	5- 22	15 1/4	-1 1/2	-8.9
A	COMMERCE GROUP CORP	1- 1	3/8	- 1/8	-25.0
A	COMPUTER INVSTRS GRP	1- 7	3 3/8	+ 1/8	+3.8
M	DATRONIC RENTAL	1- 3	2 1/2	- 1/8	-4.7
A	DCL INC	3- 5	3 1/8	- 7/8	-21.8
N	DPF INC	8- 14	10	-1 5/8	-13.9
N	ITEL	16- 36	26	- 3/4	-2.8
N	LEASCO CORP	24- 36	33 1/4	- 1/8	-0.3
O	LEASPAC CORP	1- 4	2 1/2	- 1/4	-9.0
A	PIONEER TEX CORP	3- 7	3 3/4	- 3/8	-9.0
N	U.S. LEASING	13- 20	14	-1 3/4	-11.1

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH		1978 RANGE 111	CLOSE NOV 1 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1	- 1/8	-11.1
O	ANACOMP INC	8- 22	12 1/8	+1 1/8	-8.4
A	APPLIED DATA RES.	8- 17	10 1/4	-1	-8.8
N	AUTOMATIC DATA PROC	24- 36	30 3/4	+2	+6.9
O	COLEMAN AMERICAN COS	1- 2	1 1/4	- 1/8	-9.0
O	COMPU-SERV NETWORK	6- 12	6 3/4	-1 1/2	-18.1
O	COMPUTER HORIZONS	1- 9	5 1/2	-1 1/2	-21.4
O	COMPUTER NETWORK	7- 16	7 3/4	- 3/4	-8.8
N	COMPUTER SCIENCES	8- 17	11 1/4	-1 1/4	-10.0
O	COMPUTER TASK GROUP	1- 4	3 3/4	0	0.0
O	COMPUTER USAGE	2- 4	2 1/2	- 1/2	-16.6
O	CONSHARE	6- 19	13 3/4	- 1/2	-3.5
O	CULLINANE CORP	17- 33	17 3/4	-2	-10.1
O	DATA DIMENSIONS INC	4- 9	4 3/4	-1 5/8	-25.4
O	DATATAB	1- 2	1	- 1/8	-11.1
N	ELECTRONIC DATA SYS.	15- 25	18 1/2	+ 1/4	+1.3
O	INSYTE CORP	1- 3	3/4	- 3/8	-33.3
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 5/8	+ 1/8	+2.7
O	KEYDATA CORP	1- 3	2	- 1/8	-5.8
A	LOGICON	11- 19	11 7/8	- 3/8	-3.0
O	MANAGEMENT DATA	1- 2	1/8	0	0.0
A	NATIONAL CSS INC	15- 36	24	0	0.0
O	NATIONAL DATA CORP	7- 13	8 3/8	- 5/8	-6.9
A	ON LINE SYSTEMS INC	16- 30	17	-2 3/4	-13.9
N	PLANNING RESEARCH	4- 10	6 3/4	- 1/8	-1.8
O	PROGRAMMING & SYS	1- 1	1 3/8	- 1/8	-8.3
O	RAPIDATA INC	3- 7	4 1/4	- 3/8	-8.1
O	REYNOLDS & REYNOLD	18- 36	27 1/4	- 1/2	-1.8
O	SCIENTIFIC COMPUTERS	3- 9	6 1/4	- 7/8	-12.2
O	TYMSHARE INC	18- 33	24	- 3/8	-1.5
A	UPS SYSTEMS	5- 8	5 5/8	- 1/4	-4.2
N	WYLY CORP	1- 7	4 3/8	- 5/8	-12.5

PERIPHERALS & SUBSYSTEMS

EXCH		1978 RANGE 111	CLOSE NOV 1 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	23 1/8	+1 1/4	+5.7
O	ADVANCED MEMORY SYS	7- 18	12 7/8	- 1/4	-1.9
N	AMPEX CORP	10- 19	12 5/8	-1 1/4	-9.0
O	ANDERSON JACOBSON	5- 10	5 1/2	- 1/4	-4.3
N	APPLIED DIG DATA SYS	9- 22	10 1/2	- 7/8	-7.6
O	BEEHIVE INT'L	4- 7	3 7/8	- 3/4	-16.2
A	BOLT.BERANEK & NEW	6- 14	9 1/2	0	0.0
N	BUNKER-RAMO	10- 20	12 7/8	-1 7/8	-12.7
A	CALCOMP	3- 13	5 3/4	-1 3/4	-23.3
O	CAMBRIDGE MEMORIES	3- 9	4 3/8	-1 1/4	-22.2
N	CENTRONICS DATA COMP	16- 37	23	-3 3/8	-12.7
O	COGNITRONICS	1- 4	1 1/4	- 3/4	-37.5
O	COMPUTER COMMUN.	6- 12	6 5/8	- 1/8	-1.8
O	COMPUTER CONSOLES	4- 10	6 1/2	- 3/4	-10.3
A	COMPUTER EQUIPMENT	3- 6	3 3/4	- 7/8	-18.9
O	COMPUTER TRANSCEIVER	1- 3	2 3/8	- 5/8	-20.8
O	COMTEN	9- 38	23 3/4	-1 3/4	-6.8
N	CONRAC CORP	15- 26	15 1/4	-2 7/8	-15.8
O	DATA ACCESS SYSTEMS	3- 14	11	0	0.0
O	DATA 100	9- 20	19 1/8	- 1/8	-0.6
A	DATA PRODUCTS CORP	14- 25	16 1/4	- 1/8	-0.7
O	DATUM INC	2- 6	2 7/8	- 1/2	-14.8
O	DECISION DATA COMPUT	2- 6	2 7/8	- 1/4	-8.0
O	DELTA DATA SYSTEMS	1- 1	1 5/8	+ 3/8	+30.0
A	DOCUMATION INC	6- 34	19 1/4	-2 7/8	-12.9
O	DATARAM CORP	6- 32	20	-3 1/2	-14.8
N	ELECTRONIC M & M	4- 9	4 7/8	- 1/2	-9.3
O	FABRI-TEK	1- 2	1 1/8	0	0.0
O	GENERAL COMPUTER SYS	1- 3	1 1/2	- 1/4	-14.2
N	HAZELTINE CORP	10- 17	12	- 5/8	-4.9
N	HARRIS CORP	17- 36	32 3/8	+1 7/8	+6.1
O	INFOREX INC	6- 11	6 3/8	-1 1/2	-19.0
O	INFORMATION INTL INC	7- 12	7 1/2	-1 1/2	-16.6
O	INTEL CORP	39- 62	48 1/2	- 1/2	-1.0
A	LUNDY ELECTRONICS	4- 8	5	- 3/8	-6.9
O	MSI DATA CORP	10- 19	12 1/8	- 1/8	-1.0
N	MEMOREX	27- 59	32 1/4	+1 1/4	+4.0
N	MOHAWK DATA SCI	6- 15	8 1/8	- 1/2	-5.7
O	OMEX	2- 6	5 1/2	0	0.0
O	PENRIL CORP	5- 12	10	- 1/2	-4.7
N	PERTEC CORP	9- 17	10 3/4	- 7/8	-7.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 5/8	+ 1/8	+5.0
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N	STORAGE TECHNOLOGY	19- 46	26	+ 1/2	+1.9
O	T BAR INC	11- 20	15 1/4	- 1/4	-1.6
O	TALLY CORP.	4- 9	5 1/8	- 1/4	-4.6
A	TEC INC	6- 13	7 1/4	-1 1/4	-14.7
N	TEKTRONIX INC	33- 50	42 3/8	- 5/8	-1.4
N	TELEX	3- 9	5 5/8	- 1/8	-2.1
O	TESDATA SYSTEMS CP	9- 23	9 3/4	- 3/4	-7.1
O	WILTEK INC	1- 2	1 1/8	- 3/8	-25.0

SUPPLIES & ACCESSORIES

EXCH		1978 RANGE 111	CLOSE NOV 1 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	7 7/8	- 1/8	-1.5
O	BALTIMORE BUS FORMS	2- 4	1	0	0.0
A	BARRY WRIGHT	14- 30	22 3/4	-1 3/4	-7.1
O	CYBERMATICS INC	1- 1	5/8	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	14 1/4	-1 1/4	-8.0
N	ENNIS BUS. FORMS	8- 17	11 1/2	+ 5/8	+5.7
N	3M COMPANY	43- 66	59 7/8	+1 7/8	+3.2
O	MOORE CORP LTD	26- 34	29 1/2	0	0.0
N	NASHUA CORP	18- 37	25 1/2	-1 3/8	-5.1
O	STANDARD REGISTER	20- 27	20 1/2	-1 1/2	-6.8
A	TAB PRODUCTS CO	8- 16	9 3/4	-1 3/4	-15.2
N	UARCO	19- 34	33 3/4	+3 3/4	+12.5
A	WABASH MAGNETICS	10- 22	15 3/8	- 3/8	-2.3
N	WALLACE BUS FORMS	18- 33	23 5/8	-2 3/8	-9.1

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Software Bug Delays Election News

By Nancy French
CW Staff

NEW YORK — At the height of last Tuesday's election coverage, the computer system operated by the News Election Service (NES) to tally and report raw returns in election precincts nationwide went down intermittently, delaying election coverage nationwide from one to one and a half hours, according to election news managers at local, state and natiunal levels.

The next day, a tired and testy Richard Eimers, NES executive director, attributed the problem to "a software bug" but said NES personnel never found out what it was.

"We got out everything — we were just slow," he said.

Other sources said that according to descriptions uf the problem provided by NES employees on election night, the bug was in an input program. Apparently raw data was coming into the New York headquarters but that data could not be read into the system.

At local TV stations like WCVB-TV in Boston, the NES software bug kept news writers "from getting meaningful returns until far after we shuuld have had meaningful returns;" according to Spencer Gregory, whu heads the station's election news units.

(Continued on Page 4)

Viewdata Expanded

By Don Leavitt
CW Staff

LONDON — The British Post Office and CAP Microsoft, a unit of the CAP-CPP software group, have developed a facility that apparently expands the Post Office's Viewdata service into a full-blown program distribution system and a distributed data processing facility for multiple, independent user organizations.

Available here under the trade name Prestel and marketed by Insac in various other countries including the U.S., Viewdata is a national distribution system for data. It links household TV sets, through the telephone system, to centralized data bases supplied by "information providers," according to a CAP spokesman.

A standard Viewdata terminal includes a TV set with an added microprocessor and a keypad thruugh which the user can identify the information to be displayed in printed form on the TV screen.

The concept has been extended recently to allow microcomputers, small business systems and conventional intelligent terminals to be attached. In fact, the CAP spokesman added, a TV receiver is no longer required.

(Continued on Page 8)

DP-Set Work Quotas Spark Union Walkout At Safeway Warehouse

By Marcy Rosenberg
CW Staff

RICHMOND, Calif. — A computer system installed by Safeway Stores, Inc. to increase productivity at one of its warehouses here has sparked a strike by warehouse employees that is now entering its 17th week.

Order selectors at the warehouse — members of Teamsters Union Local 315 — are striking because the system has increased their workload between 50% and 100% and resulted in unfair disciplinary action for poor productivity, according to Ron Teninty, union steward for Local 315 and strike coordinator.

Order selectors manually load cartons of food on pallets which are then loaded by forklift onto trucks for delivery to Safeway Supermarkets.

A computer at Safeway's computer center in Oakland prints out a sheet that assigns workers to "pull" a specific number of cartons for loading within a certain period of time. As workers complete each assignment, supervisors record their performance. An order selector can be fired the third time he fails to meet a full day's quota, Teninty explained.

Since the system was installed in April 1977, "90% of our 250-employee workforce has been disciplined for poor productivity," Teninty said.

"Twelve workers were terminated, more than 65 were given five-day sus-

(Continued on Page 8)

Buys Need Government OK

Brazil Users Face Sea of Red Tape

By Nancy French
CW Staff

RIO DE JANEIRO, Brazil — Imagine a world in which you would need federal government approval before you could upgrade your CPU or even purchase an additional disk or tape drive. Does it sound like a bad dream?

Well, this is the way users must operate here in Brazil if they want to buy imported gear — and with the exception of minicomputers, almost no domestically produced equipment is available.

The government approval process is part of an overall nationalization policy that calls for placing a ceiling on imports of computers and peripheral gear — $130 million this year — and establishing a domestic minicomputer industry. The government is protecting its five fledgling companies in the marketplace by forbidding users to import nearly all other general-purpose systems [CW, Nov. 6].

Because of this Catch-22 type of situation and the resulting red tape involved in getting new equipment approved, some users have been forced to operate with equipment configurations long after they have been outgrown.

Some users contend they have waited as long as nine months for approval to acquire a single disk drive.

Application Process

Government officials dispute these claims, saying that the Commission for Coordination of EDP (Capre), the government agency responsible for approving such purchases, takes a maximum of three months to review and approve projects — if the applications are complete and in order.

Applications must in part describe the user's master plan for present and future computer use and define the need for the equipment being sought in the context of that overall plan.

Several users who commented on the situation asked not to be identified because they have applications before Capre and didn't want to jeopardize their approval.

One user explained that the situation has wiped out his ability to plan. "There's no way to plan on what technology is going to be available in the future — or what companies will have permission to manufacture here — so we've given up trying to plan and nuw operate completely on an ad hoc basis," he said.

"You have to be flexible enough to take advantage of shifts in the marketplace as they occur. That's better than locking yourself into a bad plan," he said.

"U.S. users could never understand this," he continued. "They have an array of minicomputers available in

(Continued on Page 6)

Bank's DP Consultant Held In $10.2 Million EFT Heist

By Brad Schultz
And Tim Scannell
CW Staff

LOS ANGELES — The Federal Bureau of Investigation (FBI) last week arrested computer consultant Stanley Mark Rifkin on charges of using Fedwire, the Federal Reserve's electronic funds transfer (EFT) system, to steal $10.2 million from the Security Pacific Bank here.

Rifkin was apprehended at a friend's home and charged with masterminding what could be one of the largest thefts in U.S. banking history, according to sources. He is currently being held on $6 million bond at the San Diego Metropolitan Correctional Institution and reportedly faces 10 years in prison and a fine of up to $10,000 on charges including interstate transportation of stolen property.

Although Rifkin's activities allegedly involved the Fedwire system, which is used by more than 435 banks across the country to facilitate funds transfers, he did not breach the internal security of Security Pacific's CPU, according to bank officials. He apparently walked into the bank's wire transfer room, observed the process by

(Continued on Page 2)

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CPUs Down at Same Time

Overload Cited in O'Hare Delays

By Marguerite Zientara
CW Staff

AURORA, Ill. — Memory overload contributed to the air traffic delays that occurred at O'Hare International Airport here recently, according to Neil Callahan, public affairs officer for the Great Lakes Region of the Federal Aviation Administration (FAA).

The overload occurred at the Air Route Traffic Control Center (ARTCC) here, which feeds incoming traffic to O'Hare and also controls traffic as it passes through. Coincidentally, the incident took place at the same time O'Hare's two Univac 8303 processors were down because of dirt in a memory unit.

The combination of problems caused major air traffic delays throughout the Midwest on Oct. 25 because of the slowdown of departures from O'Hare [CW, Nov. 6].

Callahan could not be more specific about the incident nor could other FAA sources, but John Galipault, president of the independent Aviation Safety Institute of Worthington, Ohio, described the problem as one of memory saturation. The IBM 9020Es in the ARTCCs around the country have "too small a memory and too little power," he said.

Part of the trouble is associated with the "slew ball," a cursor that can be moved to any point on a terminal screen for display of current information about a plane. Twenty controllers using the slew ball at once has been known to cause the 9020 system to operate at 98% capacity, Galipault said.

"It gets so bad at times that the boards will print out a message saying, 'Do not use the slew ball,' " he remarked.

Since the simultaneous computer malfunctions at O'Hare and ARTCC exacerbated each location's problems, air traffic controllers at O'Hare filed an affidavit with Federal Judge John Powers Crowley asking for a quick decision in a lawsuit filed in 1975 against the FAA, the Civil Service Commission and the Department of Labor.

A simple solution, according to Callahan, would be to "buy a bigger computer for the ARTCC, but we just don't know yet if that is the answer" since the problem has occurred "just once" in the seven years since the system was installed.

The suit asked for a computer backup system and new software testing procedures at O'Hare.

As yet, there has been no response to the affidavit.

Consultant Held for Theft

(Continued from Page 1)

which authorized Fedwire users are assigned identification codes and subsequently used this knowledge to impersonate a bank official and order the transfer of the money to his account at the Irving Trust Co. in New York.

Rifkin then allegedly transferred most of the funds to the Swiss bank account of Russalmaz, the Soviet government's official diamond broker, and purchased approximately $8 million worth of polished stones, according to Don Morrison of the Los Angeles FBI office.

The crime reportedly went undetected for eight days, perhaps because the transaction was relatively small by normal bank standards, sources explained.

Although bank officials refused to elaborate on the details of the incident, Rifkin's ability as a computer consultant to move freely about Security Pacific's wire room is considered to be a key aspect in the case.

In addition, the consultant apparently knew enough about the bank's security precautions to make the phone call effecting the transfer at a time when the bank's security was most vulnerable, a Security Pacific official said.

Authorities aren't sure why Rifkin purchased the more than 19 pounds of jewels or exactly what he did after he returned to the U.S. He allegedly negotiated to sell 12 diamonds, worth more than $50,000, in Beverly Hills, Calif., and planned to dispose of a few more in Rochester, N.Y., officials stated.

The FBI has recovered the diamonds, worth more than $13 million on the retail market, and has "located" most of the remaining $2 million in cash, a spokesman said.

The crime marks the second assault on Security Pacific's Fedwire defense in three months. Last summer, the bank averted an attempted $140,000 heist involving the impersonation of a Bausch & Lomb Co. financial officer [CW, Aug. 14]: The perpetrator was convicted in September.

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Telephone Computer Configuration

Networks' New Systems Ready But Not Able

By Connie Winkler
CW Staff

NEW YORK — NBC and CBS were poised and ready to exercise their upgraded election news forecasting systems here last week, but since both systems depended heavily on raw returns provided by the News Election Service (NES) computer system — which was down intermittently throughout the evening — neither network benefitted as much from the systems as network executives had hoped.

Both NBC and CBS, which considered last week's election news coverage a dry run for "the really big show in 1980," in the words of one network executive, were severely impacted by the lack of raw returns from NES. (see story on Page 1).

The only thing that wasn't computerized about NBC News' election coverage was a giant 24- by 14-ft. U.S. map, which viewers saw in red, white and blue, showing how each state voted. The 10,000 light bulbs on that map were operated manually by switches, Roy Wetzel, general manager of elections and polling for NBC, explained. NBC has no plans to connect that map to the Cherry Hill, N.J., RCA computer center, which is the heart of NBC's election coverage, he said.

NBC's coverage of Election Day, 1978, could have been the most sophisticated on the three networks and surely was the most ambitious for NBC since it first applied the computer to the elections in 1964.

Significant File Changes

"Over the past two years, we have made some significant changes in our file structure. There have been changes in the universal data base to make it easier to access," Wetzel said about NBC's DP operation. "The computer doesn't have to look in so many places to find information."

The new programming for two IBM 370/168s means the computers now generate information the decision desk in the NBC studio needs even before that information is requested. "The computer gives us answers before we ask — literally tells us what we should have been asking," Wetzel said.

The election programming provides for calculations which Wetzel, a former NBC bureau chief, calls "spooky." Raw results are dissected, and the system then performs various calculations, specifically looking at geography and past political behavior.

Besides the more sophisticated programming this year, NBC launched its most extensive polling effort. Thirty thousand voters leaving polls in 1,100 locations were asked 30 questions on why they voted as they did.

Other Data Sources

The poll results were just part of the information that came into election night centers in Cherry Hill and New York City. Operators answered phones and entered results into 100 IBM 3270 terminals in Cherry Hill and 50 Harris Corp. terminals in Manhattan.

The operators also received key precinct results specially supplied to NBC. Three thousand people across the country phoned in local totals, which aided NBC in projecting race outcomes.

In addition, the center received the raw election results that were eventually compiled for all media by the News Election Service (NES) here.

The raw figures were to have been displayed on Chyron Corp. tubes, which are full-screen digital character displays shown directly on the air. Chyron screens were on-line so that election totals could be updated on the TV screen as soon as they were received. But since raw tallies were so late, the tubes got little use.

The studio was also equipped with a Digital Equipment Corp. PDP-11/60 with a special CRT for horizontal and vertical graphs. The color graph system was developed by the Independent Television News Organization in England. NBC News purchased the right to use the system in the U.S. and, with DEC, modified it for this country's elections.

Only a computerized graphics device can always have such a wide variety of pictures available. "With all the senatorial, gubernatorial and House contests we're covering, the ability of the computer to instantly change numbers into pictures is the key to this new graphics device," Wetzel said. "It's a product of the revolution in digital technology."

The PDP-11/60 was connected to the 168 so raw results could be instantly translated into the animated displays.

However, this, too, saw little action. The device was to have allowed comparisons of the projected vote at a certain time in the evening to the actual vote at that same time two years ago.

Armed with this information, Wetzel, stationed NBC's decision desk, faced the awesome job of guessing what was going to happen in the various races.

Cronkite's Tool

At CBS, even Walter Cronkite was depending on IBM. Cronkite sat next to a 3270, one of 70 in the studio, to get his results. CBS's entire election coverage depended on an IBM 3033 and a 370/168, which worked together, but the election programming could have run on either.

CBS has made drastic changes in its programming software for election night, according to Richard Silverman, associate director of the elections and survey unit. The switch has been from MVT, which ran on three 155s, to an MVS environment.

"Our problem has been to build a system that is supposed to run every two years," Silverman said. "It was a hugh problem trying to test a very large system, while at the same time avoiding interference with the normal computer environment."

System Works Modularly

Because the new CBS system works modularly and takes advantage of MVS features, it has little impact on CBS's day-to-day computer operations, Silverman said. It also allowed CBS to run election night rehearsals.

Linked by phone lines to the IBM CPUs were two DEC PDP-11s, which were used for CBS's projections. The project data base was updated in real time with raw figures from the IBM CPU and the NES service, when they were available. Like NBC, CBS also linked the Chyron electronic character generator to the PDP-11 via Binary Synchronous protocol to show viewers what was happening in various races.

The CBS TV control room had four Delta Data Corp. CRTs to help producers decide what results should be on the air.

The 3270s in the studio were flanked by five IBM 2780 printers, which were also used by the news correspondents.

Number-Crunching Ability

The modularity of the new software allowed CBS to do a lot of number crunching to interpret the voting results from the 3,000 selected precincts around the country, Silverman said.

With all those reports coming in, another software module allowed the results to be quickly and efficiently entered into the CPU, again via IBM terminals. The CRT screen prompted the telephone answerer as to the next piece of information needed.

From those telephone answering terminals, the data went to the CPU for verification, and once in the CPU the computational models took off, the associate director explained.

About 20 DP professionals along with hundreds of other workers were busy at CBS Tuesday night. Silverman said this year he was more confident about the hardware and a little worried about the software. In his 10 years of "election madness" at CBS, Silverman said he used to always worry about the operating systems.

Bugs Slow Networks' Election Reports

(Continued from Page 1)

There are two things a station does in reporting elections, Gregory explained. It displays "the total unofficial cumulative vote for each candidate" and also uses "specific figures — both overall vote and voting in specific areas — to try to spot trends and make projections.

"What we mainly missed Tuesday night was the raw vote," he said, adding, "It was early in the evening that we were getting killed."

Normally, raw returns, gathered by NES and reported to local stations via Associated Press (AP) and United Press International (UPI) wire services, are available for broadcast within 45 minutes after the polls are closed, Gregory explained. But by 9 p.m. Tuesday, "we only had about 1% in when we should have had 5%," he said.

Troubles for UPI

At UPI's Washington Bureau, the slowdown in vote tallies delayed UPI's declaration of which of the two political parties had gained control of the House and Senate, according to Grant Dillman, UPI vice-president and Washington Bureau manager.

"Our bureaus [located in state capitals across the country] couldn't call the local races because NES returns were late on the state level."

"We declared control of the House at 1:38 a.m.," about 1-1/2 hours later than would normally have been the case in an off-year election if NES had been working at full capacity," Dillman added.

All in Same Boat

But although WCVB-TV's Gregory felt his station's election news coverage was "getting killed," all were in the same boat, since NES was the source of raw returns for all media.

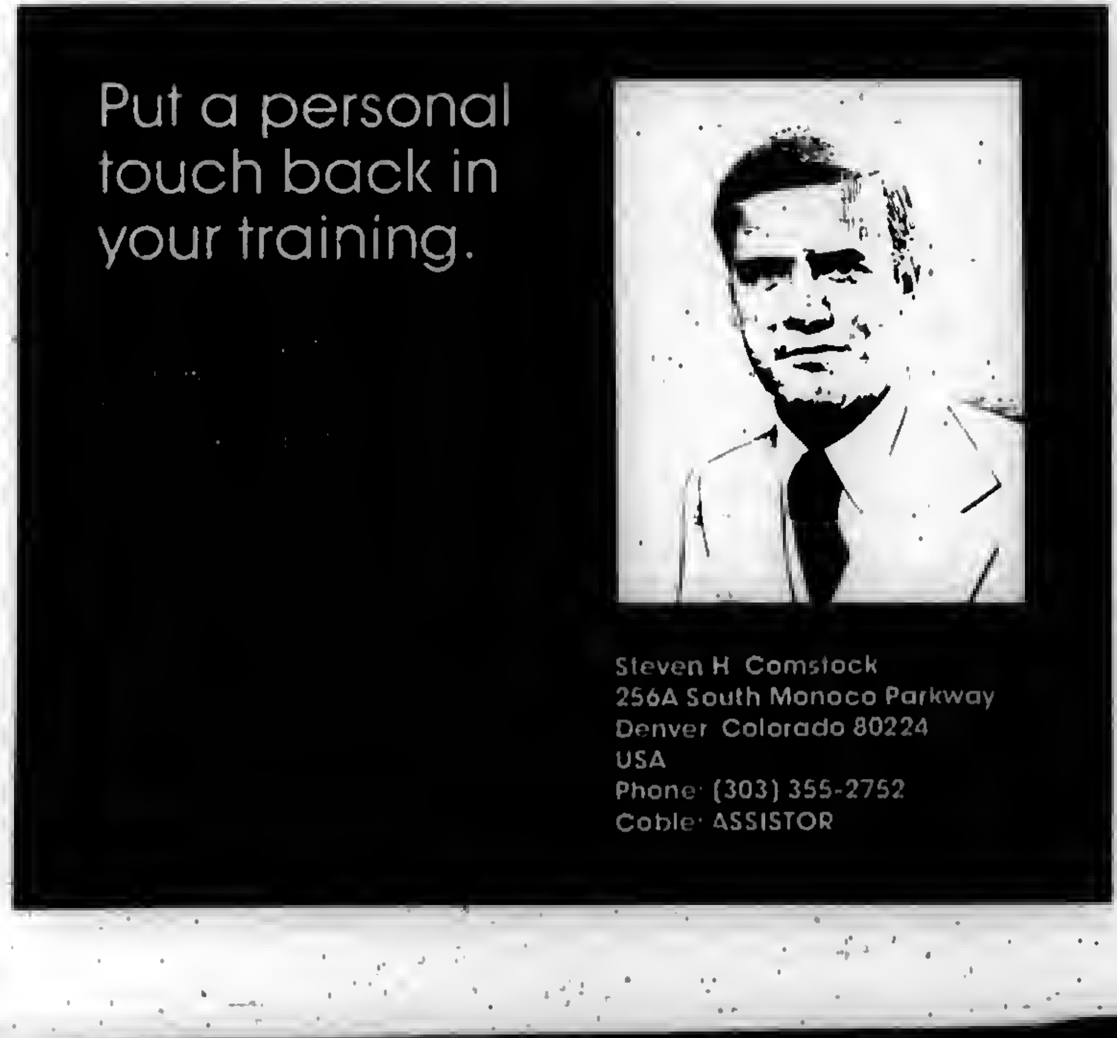
NES was established after the 1964 primaries to provide election returns to the three national TV networks as well as the two major wire services — which in turn report that data to subscribing radio and TV stations as well as local newspapers.

Costs are shared by the five members. Fewer than a dozen people are employed year-round, but temporary hires on election day swelled that figure to 150,000 this year.

NES reporters at local precincts telephone results into regional centers in four cities, where operators keypunch the data as it is reported.

The data is then transmitted to NES headquarters in New York, where it is processed on an IBM 370/ 165 backed up by a 155.

Data is then output in table form as printer output or computer-to-computer output.



ABC Claims Victory in Race To Predict Election Results

By **Jeffry Beeler**
CW Staff

NEW YORK — ABC claimed victory last week in the race among the three national TV networks to predict the winners in this year's senatorial and gubernatorial elections.

With all three networks using sophisticated computer systems to project winners, ABC News claimed it predicted the winners first in 41 races, giving CBS 14 of the first predictions to NBC's nine in the races that had been decided by 6 a.m. Wednesday.

All three networks used this year's elections as a warm-up for the 1980 presidential race, where they will be vying to see which can predict the presidential winner first.

ABC officials said they were able to make the correct calls in spite of the delays and downtime of the News Election Service (NES) because of a network of a League of Women Voters volunteers that called in results at 3,000 key precincts to the computer center run by Computeristics, Inc., the DP subsidiary of Uniroyal, Inc.

However, they said they were stymied in several races in which the vote totals from the key precincts were "too close to call" without the data which was being delayed by the NES breakdown.

But in spite of some rather unexciting commentary on ABC to fill time in the interim, its computer setup helped it project winners faster than either of the other networks.

In 1976, the first year of the ABC/-Computeristics partnership, the system helped the network score more election prediction "scoops" than NBC and CBS combined, Computeristics sources claimed.

Election Models

ABC and Computeristics base their projections on computer-generated election models consisting of three main elements: "baseline estimates," input from NES and vote tallies from a nationwide sample of key precincts that have been carefully selected to provide a cross section of each state's electorate.

Computeristics prepares its baseline estimates well in advance of an election, while the other two elements are incorporated into the model as they arrive at the company's DP center during election night.

Used primarily for comparison with actual vote totals, the baseline estimates rely on data from previous elections to predict the probable outcome of upcoming races.

The NES reports, meanwhile, arrive at the DP center via two teletypewriters and include complete election returns from every state where voting is taking place.

The key precinct ballot figures, by contrast, account for only a small percentage of each state's total voter turnout, but they represent each of the state's major ethnic, religious and other demographic groups. Thus, when combined, the tallies from these precincts constitute an election-in-miniature whose outcome almost invariably reflects the will of the state's voting public as a whole.

The 3,000 or so precincts comprising ABC's nationwide voter sample were selected in part because in past elections they have consistently voted for the winning candidates, Computeristics' vice-president of marketing Chester Habegger explained.

Volunteer Assistance

To transmit election results from the key precincts to the Computeristics DP center, ABC relied heavily on volunteer assistance from the League of Women Voters. After the polls closed on Election Day, a League representative at each key precinct tabulated the returns and telephoned the results to the DP center's "key precinct room."

There, a team of other league volun-

(Continued on Page 6)

Volunteers from the League of Women Voters doubled as data entry personnel to help ABC News predict the winners in last week's gubernatorial and U.S. Senate elections.

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Brazil Users Caught in Government Red Tape

(Continued from Page 1)

whatever price ranges or capabilities you could want. All are from companies that offer good vendor support and maintenance service.

"You can choose whatever options give you the maximum capabilities. You can plan what you want, order it from the vendor and have it installed pretty much on whatever schedule your plan calls for," he said.

That's not the case in Brazil. Here "our choices are narrowed to five companies and in practical sense only to Cobra [a company formed jointly by the government and private interests], because Cobra is the only organization that can offer any type of maintenance or support. The other organizations are just getting started," he said, "and it will probably take a year or two for them to support their systems in the field."

Users Penalized

Another user complained that users who planned their systems carefully and assured they didn't buy processing capacity they didn't need are being penalized under this new program. "The guys who made mistakes in acquiring their systems or bought oversized systems to keep up with the Joneses' are benefitting now that approvals cannot be gotten through Capre and that isn't fair," he said.

One result of the Capre approval process is that users are now inclined to acquire whatever systems they can get approved — whether they need them or not — so that when they do need the systems, they will have them.

For example, one bank that had two computer installations — one in Sao Paulo with an IBM 360/40 and one here in Rio with a 370/145 — wanted to upgrade the Sao Paulo installation to a 138. However, because the 138 had to be imported and the bank could not count on getting its application approved by Capre by the time it needed the system up and running, it decided to move its 370/145 from Rio to Sao Paulo instead of planning on a 138 and having the import application refused. It then bought a 148 to replace the 145 in Rio.

This was far more costly and yet it was the best choice "because the 148 is manufactured in Brazil and needed no government approval," a bank spokesman explained. Ironically, the decision left the bank with considerably more computing power than it needed — which is exactly what one part of the government program is aimed at rectifying.

"We would have been very happy with a 138 in Sao Paulo and a 145 in Rio, but we didn't really have any alternative," he said.

Setbacks for Some

Several users who were in the midst of planning a shift to distributed processing when the government instituted the new cumbersome approval procedures and reduced user options had to dump their plans and start again from square one. One of those users is Xerox Corp.'s Brazilian subsidiary.

Bob Larson, a systems analyst with Xerox, said that organization had upgraded from an IBM System/3 to a 370/135 in March 1976 and was planning to implement a distributed processing system based on nine Datapoint Corp. 5500 ARC systems.

The plan, according to Larson, involved automating many of the manual applications now being performed in the branches, such as calculating salesmen's commissions. It also called for offloading some additional work from the mainframe and distributing it among the branches — an arrangement that would have enabled Xerox to bring back in-house some other applications that were being run after-hours at the stock exchange.

The entire plan had to be scrapped — after one Datapoint system had already been purchased. Importing Datapoints is now impossible.

There are basically five systems to choose from, according to Larson, but none is as good as what Xerox had wanted.

Capre Motives

Despite the frustrations brought about by the country's new computer policy, users were in agreement about the motives and intentions of the Capre itself.

Capre was established to implement that country's nationalization program and the organization is being run by dedicated people. The nationalization policy is similar to the one established by the Japanese government in the 1950s to protect that country's domestically made computer products, one user explained. "In Japan, that policy was a big success; that's a pretty good argument for nationalizing the industry here."

Capre treats all users fairly. In this sense, the policy is not arbitrary, he said. However, the policy they are trying to implement is not crystal clear. Capre analysts have to evaluate every application in terms of the overall policy, and in doing so, that policy needs constant clarification. That's where the arbitrariness comes in, he added.

"Brazil must develop a broad range of capabilities, and the only way it can do so is to design, invent and create technology on its own. It's got to start somewhere," he said.

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ABC Claims to Be Victor In Election Forecast Race

(Continued from Page 5)

teers noted the ballot counts and entered the information into 10 IBM 3270 CRT terminals, which transmitted the input at 9,600 bit/sec to two 16M-byte IBM 370/158s. To speed information retrieval, both 370/158s stored almost all their files in main memory rather than in disk packs, according to John Congedo, systems manager for the ABC News Political Unit.

After the two mainframes had merged the key precinct vote totals into their computer model, the job of predicting election outcomes began at the two "decision desks," one floor above the key precinct room.

Using another cluster of on-line 3270s, the decision desk staff — reporters, statisticians and other veteran political observers — summoned each state's election returns in the form of a series of "D," or decision desk, reports.

Besides showing the percentage of key precincts reporting, the decision desk reports summarized the vote totals for both the Democratic and Republican candidates in each statewide gubernatorial and senatorial election. These summaries showed the vote percentage Computeristics predicted for each candidate in its baseline estimate, the actual vote percentage for each candidate as reported by NES and the amount of "swing" — the difference between the estimated and reported returns.

In addition to providing vote totals for each state as a whole, the decision desk reports detailed the election returns for each geo-political division and precinct within that state. If examination of these breakdowns showed one candidate ahead in most or all of a state's key precincts, the decision desk staff could reasonably conclude the leader would win the election.

If, however, the key precinct leads were evenly divided between two opposing candidates, the decision desk staff members postponed their predictions until a more decisive voting trend emerged — a process that was slow this year due to the NES breakdown.

After the decision desk staffers had picked a probable winner, they relayed their projections over a communications line nicknamed the "red wire" to the "analysis desks" in ABC's New York, Chicago and Washington, D.C., studios.

At the analysis desks, a team of political analysts armed with other 3270s retrieved assorted election reports from the dual mainframes to uncover possible reasons behind each winning candidate's victory. With these reports, for example, the analysts could break down a candidate's election returns to determine how much of his or her vote total came from voters of various ethnic, religious and income backgrounds.

The analysts could then combine these breakdowns to yield increased analytical detail. For example, they could merge the breakdowns for blacks and various income categories to determine what percentage of a candidate's vote total came from, say, middle-income blacks. Or, using the same technique, the analysts could determine to what extent a candidate's victory was decided by ballots from high-income Jewish voters.

Schumacher Gets Office Created By Software Unit

PALO ALTO, Calif. — David J. Schumacher has been promoted to the newly created position of vice-president for member services and consulting for the Institute for Software Engineering.

The institute's president and founder, Kenneth W. Kolence, explained that the new position is a part of the institute's expansion of services.

Schumacher, who joined the institute in March 1978, will be responsible for memberships, courses, workshops, publications and consulting efforts in the general area of computer capacity management for institute members.

Printout Shows Wrong Finisher

Woman Home With Injury Gets Race Trophy

By Ann Dooley
CW Staff

BOSTON — The second annual "Heartbreak Hill" 7.3 mile race here could have been a double heartbreak for Susan Hughes, the first woman runner to cross the finish line, because the automated system tracking runners' finishing times did not register her as the winning female.

The error occurred for reasons unknown to both Hughes and Honeywell, Inc., whose system computed the scores.

Hughes, who ran with 2,008 other male and female entrants, said she was beseiged by the press and onlookers after being the first woman to finish this year's grueling race, but was later denied the trophy because the computer printout indicated that another runner was the first woman over the line.

Honeywell spokesman John Aeberhard said although Hughes notified a race official of the error, no Honeywell officials were informed of it until the next day.

"It's a mystery as far as we're concerned because the system performed flawlessly," Aeberhard said.

'Winner' Absent

The number worn by Hughes was entered into the system after another number, assigned to Donna Carty, had been entered. However, Carty was unable to run because of a knee injury and was at home at the time of the race.

Honeywell officials contended that although they did not know who ran wearing Carty's number, according to their data the number 2087 crossed the finish line in 132nd place with a time of 44:28.

The Honeywell system is set up so that as a runner crosses the line, his recorded finishing time is entered into a Level 6/47 computer. Each runner then enters one of several chutes where race officials collect his number in finishing order. The system then matches the number with the recorded time and combines that data with the runner's name and statistics.

Following these steps, the system named Carty the winner. Any more than that is unclear, according to Tom Eifler, another Honeywell spokesman.

Not System's Fault

Both Eifler and Aeberhard denied the computer was at fault and indicated several other possibilities that could have brought about the confusion.

This was the first Honeywell-monitored race in which the company's race DP team did not assign the runners' numbers, they said. A duplicate of Carty's number could have been assigned to a runner who did finish the race, or a recording judge could have mistakenly transposed another number when entering it into the system.

Honeywell has checked this possibility, however, and all similar numbers have been accounted for, Eifler said.

A third possibility is that the numbered badge assigned to Carty was lost or stolen and used by another runner. Carty could not be reached for comment concerning this.

Question of Judgment

The problem for Hughes might have been avoided if a Honeywell official had been notified right away, Eifler said. Although the Honeywell system was used to track the runners times, it should have been regarded as a supplement to the judges' decisions and not as the final word.

It was Carty herself who first became aware of the mistake and notified race officials of the problem. "I know what one must go through to win a race, and I'd like that person to get the credit," Carty told officials.

Hughes was finally declared the official woman winner, finishing in 182nd place. Hughes, who had attempted to explain the problem to an unidentified official upon finishing the race, was told she would have to wait several days until the computer results were checked out.

BAI Sets Meet; ATM the Focus

PARK RIDGE, Ill. — The Bank Administration Institute's (BAI) Automated Teller Machine (ATM) Conference will be held Dec. 6-8 in Houston. One of the opening session's lead speakers will be Thomas Sodergren, project manager of the Swedish Savings Banks Association.

In Sweden, savings banks have full commercial powers, according to BAI, and Sodergren is responsible for more than 3,000 teller terminals and 370 online cash dispensers, controlled from a data center in Stockholm and servicing savings banks throughout Sweden.

The National ATM Conference will feature a series of national and international examples of ATM experiences pertaining to fees, costs, sharing, interchange, on- and off-premise locations and market impact of ATM programs.

Additional information on the conference is available from the BAI at P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

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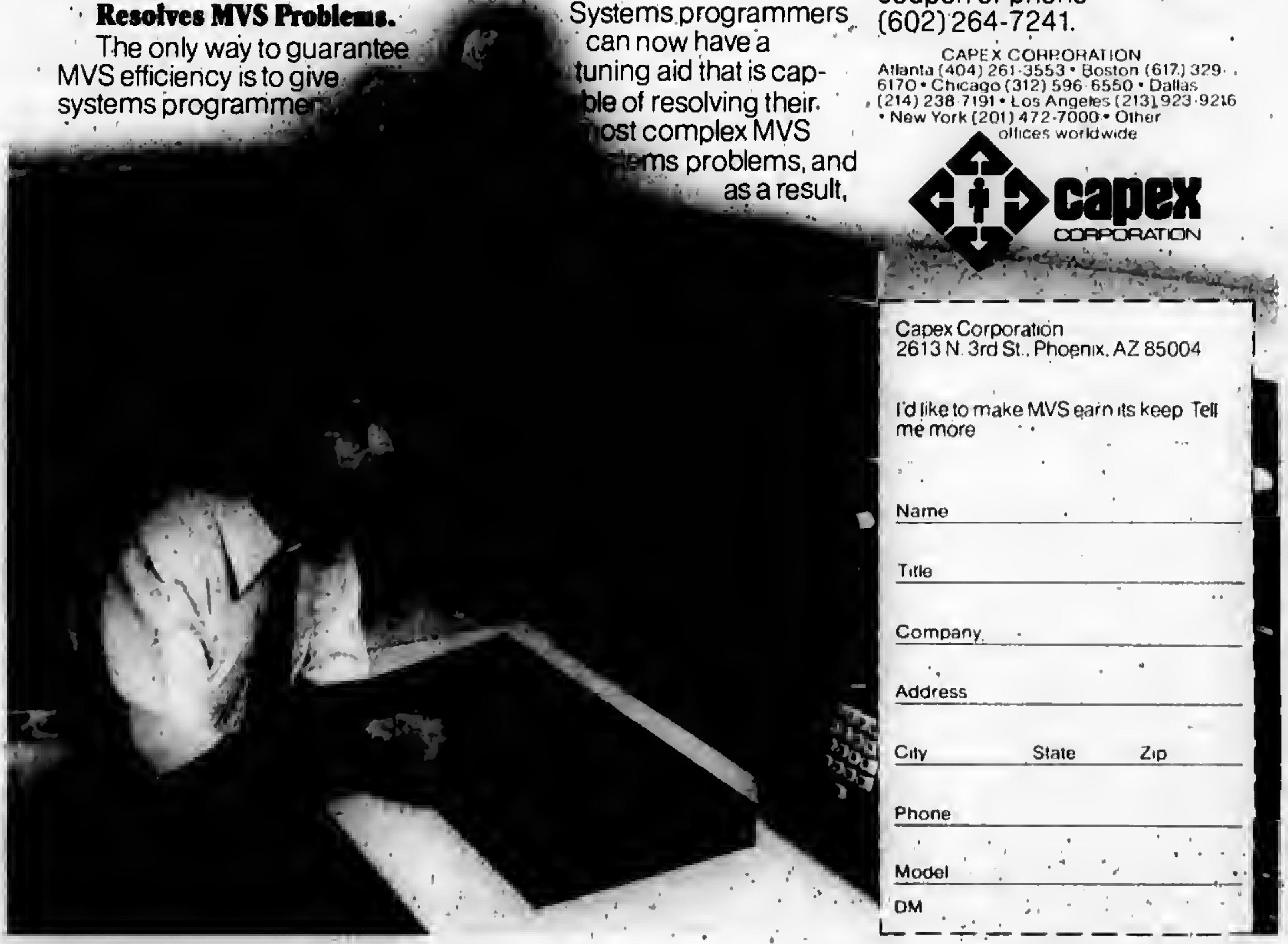

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Union Charges DP-Set Work Quotas Unfair

(Continued from Page 1)

pension without pay and the rest received warning letters or reprimands for unsatisfactory work performance."

Time Measurement Studies

The productivity standards Safeway has imposed with the sytem are based on the Method Time Measurement (MTM) studies the Department of Defense (DOD) conducted in the early 1940s to gauge its own warehouse productivity during World War II. Safeway previously used the "piece count" standard.

What Safeway did, Teninty said, was observe warehouse workers' movements while selecting items and assign a set of body motions to each item.

The computer was fed this information, each worker's height and weight, plus the blocking pattern on a 40- by 48-inch pallet and the material composition of every item in the warehouse. In addition, a "blueprint" of every square inch of the warehouse was fed to the computer so it could determine the location of racks and pulls, and the distance between any two points.

Given all this data, Teninty said the computer could read each select order, or invoice, to determine the number and type of items to be selected, track the item selection path, determine the movements required and assign a time value to complete the order, based on the MTM averages.

Too Sophisticated?

The system "is sophisticated to the point where a warehouse person could not understand it, keep track of it or control it. He is at the mercy of a computer programmer and his employer to tell him whether he is doing a good job.

"He also has no means of verifying a supervisor's criticisms, since we very rarely get two identical invoices with which to compare time standards," he added.

Despite the drawbacks of the piece-count method, Teninty said that in the nine years he has been steward, "I can think of only six cases where someone was terminated or suspended for unsatisfactory work performance."

Because so many workers could not meet the performance standards set by the computerized system, "Safeway management reached a point where it had to stagger suspensions from week to week, almost like vacations, so we wouldn't be shorthanded," Teninty said.

"We are striking to eliminate the computer system completely," he stated. "If Safeway feels there is a productivity problem and that it has to have a method to measure productivity, then we want one that the individual worker can understand and monitor — himself — on a daily basis."

Lawsuit Planned

Whatever the outcome of the strike, union local plans to sue Safeway on grounds that the standards imposed by the computer system discriminate against women and older men.

"MTM experts have testified in arbitration that women and men over 45 were not part of their time study population," Teninty noted, adding that Safeway nonetheless applies the MTM-based standards to workers in both of these categories.

"Out of our 250 order selectors, 15 are women. Of those 15, two have been fired, six have been suspended and the others have received warning letters,"according to Teninty, "because they failed to meet the new productivity standards."

An industry spokesman said the Safeway system takes into account the average age of workers but not the age of individuals.

Safeway would give no details about the computer system, nor would it comment on the controversy around it.

Program Distribution System Expanded

(Continued from Page 1)

Viewdata recognizes the need for controlled distribution of whatever is on the system by providing "closed user group" facilities under which designated data bases are accessible only by prescribed terminals.

The whole operation is built around a series of General Electric Co. Ltd. 4080 message-switching systems with substantial disk space for data stored locally. The 4080s are interlinked so data is accessible to authorized users nationwide, regardless of where the data is physically stored.

Program Distribution

The Viewdata Terminal Programming (VTP) support introduced by CAP Microsoft at a press conference here recently extended the depository/-extraction nature of Viewdata significantly. It allows conventional users to be more selective in their viewing and permits users and vendors to move data and programs to home or office computers and from one site to another, regardless of the type of equipment involved.

In essence, VTP consists of two sets of programs. The Suppliers Part is the software which takes an application program, arranges it in a form suitable for Viewdata and sends it, via a telephone line, to the selected data base at a Viewdata center.

Program Downloading

The Terminal Part is the software in the terminal or small computer attached to Viewdata which downloads selected programs, in the form of pages of data, from the center to the user facility. This software converts the pages of data into useful application programs, CAP said.

Since telephone lines "are not a totally error-free form of communication," VTP incorporates a checking mechanism to ensure that a page has been transmitted correctly and to trigger a retransmission if that should be necessary, the CAP spokesman added.

More Selective Viewing

With facilities applying local intelligence to data, even users of the basic Viewdata service can be more selective in their viewing of data bases, according to the spokesman. A user can ask for the next train to a selected destination, for example, rather than having to browse through an entire timetable, as he now must do.

At the next level, it might mean an organization's central DP staff can send programs or other material to each of its subsidiary units electronically. But the potential for VTP is far greater than that, the spokesman said.

In addition to the current "information providers," software firms can link into the system and distribute identical copies of their products to their authorized clients.

Key to Plan

The key to such a wide-ranging distribution plan, CAP claimed, is the assurance that the programs being sent downline from the one centralized copy will all be implemented and run identically, no matter what kind of equipment the users have at the receiving end.

The first example of this concept being carried into a working system — in VTP — utilizes CAP's Microcobol, but it can and will be applied in other languages later, according to CAP. Basic is likely to be the next language with more specialized ones such as Fortran following along in time, the spokesman predicted.

In any case, he said, the company has already shown — at the 1978 National Computer Conference in June, at the VTP press conference and elsewhere — that Microcobol is fully transportable between machine types.

Copyright Protection

In addition to the password-like facilities offered by "closed user groups," VTP provides effective copyright protection for proprietary software by storing the intermediate code in unreadable form and by supporting a retention period for program use. The program carrying out the transfer to the user site calculates an expiration date, after which the new program will not run, the spokesman explained.

As an offshoot of the demand for the identical operation of programs regardless of equipment used, independent consultants as well as software houses can be linked in the system and usefully serve remote clients.

With VTP, consultants can presumably offer to analyze — and cure — problems in user programs by transferring the troublesome program and data from the user site through Viewdata to the consultant's own facility, where it can be exercised at will, CAP noted.

VTP is available only as a part of the Viewdata service and its cost is effectively tied into use of the service, the spokesman said from CAP House, 14-15 Great James St., London WC1, England.

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Carter Program Detailed

CHICAGO — Facts and new developments concerning President Carter's recently announced inflation-fighting program of voluntary compliance with the Administration's wage and price standards are available in a publication from Commerce Clearing House, Inc. (CCH).

"Economic Standards" is a loose-leaf publication that will be updated through current reports by the tax and business law publisher.

Included are documents relating to the National Productivity Council, the Council on Wage and Price Stability monitoring standards and guidelines and listings of key personnel overseeing the program's operation.

The publication will cover developments as they occur from Nov. 1, 1978 through Jan. 31, 1979. The subscription price for that period is $70. CCH is at 4025 W. Peterson Ave., Chicago, Ill. 60646.

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Self-Assessment Urged to Combat Obsolescence of DP Professionals

By Brad Schultz
CW Staff

NEW ORLEANS — The state of the DP art changes so fast that within a few years many DP professionals are left incompetent at jobs they once performed well.

Management should provide DPers with technical self-assessment programs as an effective and inexpensive means of minimizing such obsolescence, but self-assessment should never be used by managers to evaluate the personnel under their supervision.

Those views were presented by Dr. Terry J. Frederick at a recent Data Processing Management Association conference session here that pondered whether self-assessment is a worthwhile management tool. Frederick is chairman of the computer science department at Florida Technological University in Orlando.

Self-assessment should be "private and confidential, not threatening or embarrassing, and sufficiently convincing that further development is . . . needed," he told the session.

Self-assessment "is neither testing or certification; it is not a means whereby an individual satisfies others about his knowledge," he continued. "Rather it is for the participant to appraise and develop his own knowledge."

Frederick said his conception of self-assessment presumes that the participant wants to continue to learn and to identify his deficiencies — "usually in a manner where no one else knows of them."

Further, the participant is presumed willing "to answer a set of questions voluntarily — if done at his own convenience — and to carry out actions to correct his recognized deficiencies."

While some may choose to start with the questions first, others may elect to start with the answers or with reference materials, Frederick said, indicating the participant should have full control of the procedure.

'Half-Life' Jobs

The computer scientist suggested that a "half-life" value — in terms of years — may be assigned to a particular DP job classification. According to this notion, the knowledge necessary to perform the job satisfactorily is conceived as an amount that decreases with time.

For example, a five-year half-life for a commercial programmer/analyst means a person presently competent in that position would five years from now possess half the knowledge necessary for adequate performance.

"Simple calculations can be employed to estimate the percent of time needed to be spent on continuing education to keep the knowledge level constant, given a particular half-life value," Frederick maintained.

"However, the existence of a need for continuing education to avoid knowledge obsolescence does not address the issue of how to determine what additional knowledge is desired, what knowledge is needed and how it is to be obtained," he noted.

Self-assessment allows a DP professional to monitor his knowledge deficiencies and detect any drift toward obsolescence, Frederick said. He also called the process a means of staying competitive with peers, preparing for future responsibilities and deriving intellectual pleasure.

Potential for Damage

Reviewing the history of professional self-assessment, Frederick recalled that about 10 years ago the U.S. medical and dental communities found some members being left behind. Self-assessment for physicians and dentists was promoted largely because governing bodies for these professions "were acutely aware of the potential for damage if it became generally known that any [of their colleagues] were out-of-date," he said.

A means of private and confidential "self-exploration" was promoted because the physicians and dentists wanted validity and yet wished to avoid the psychological effects associated with imposed testing, he continued.

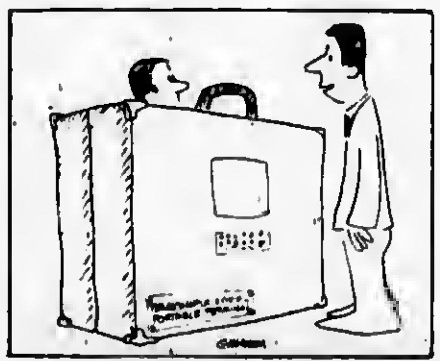
The obsolescence problem for computing professionals was also recognized about this time.

Overwhelming Response

Frederick was appointed in 1973 to chair an Association for Computing Machinery (ACM) committee charged with determining whether self-assessment for the DP professional was desirable and feasible. Eventually, the *Communications of the ACM* was chosen as a "low-cost delivery system" for self-assessment exams. Solicited responses to these deliveries "were overwhelmingly supportive," he said.

About 850 questionnaires were returned, indicating 95.2% of the respondents found the self-assessment experience worthwhile, 89% learned something and 81.5% discovered concepts previously unknown, Frederick said. Just less than two-thirds reported they had learned concepts pertinent to their jobs and followed up by discussing the procedure with others or by reading the suggested reference materials.

Almost all respondents wanted more self-assessment procedures and about 75% said they were willing to pay for a more extensive version, Frederick said. He added, however, that the amount most were willing to pay (74.4% allotted $10 or less) was much smaller than the estimated cost of producing such a procedure — $100 per copy, assuming several thousand participants.



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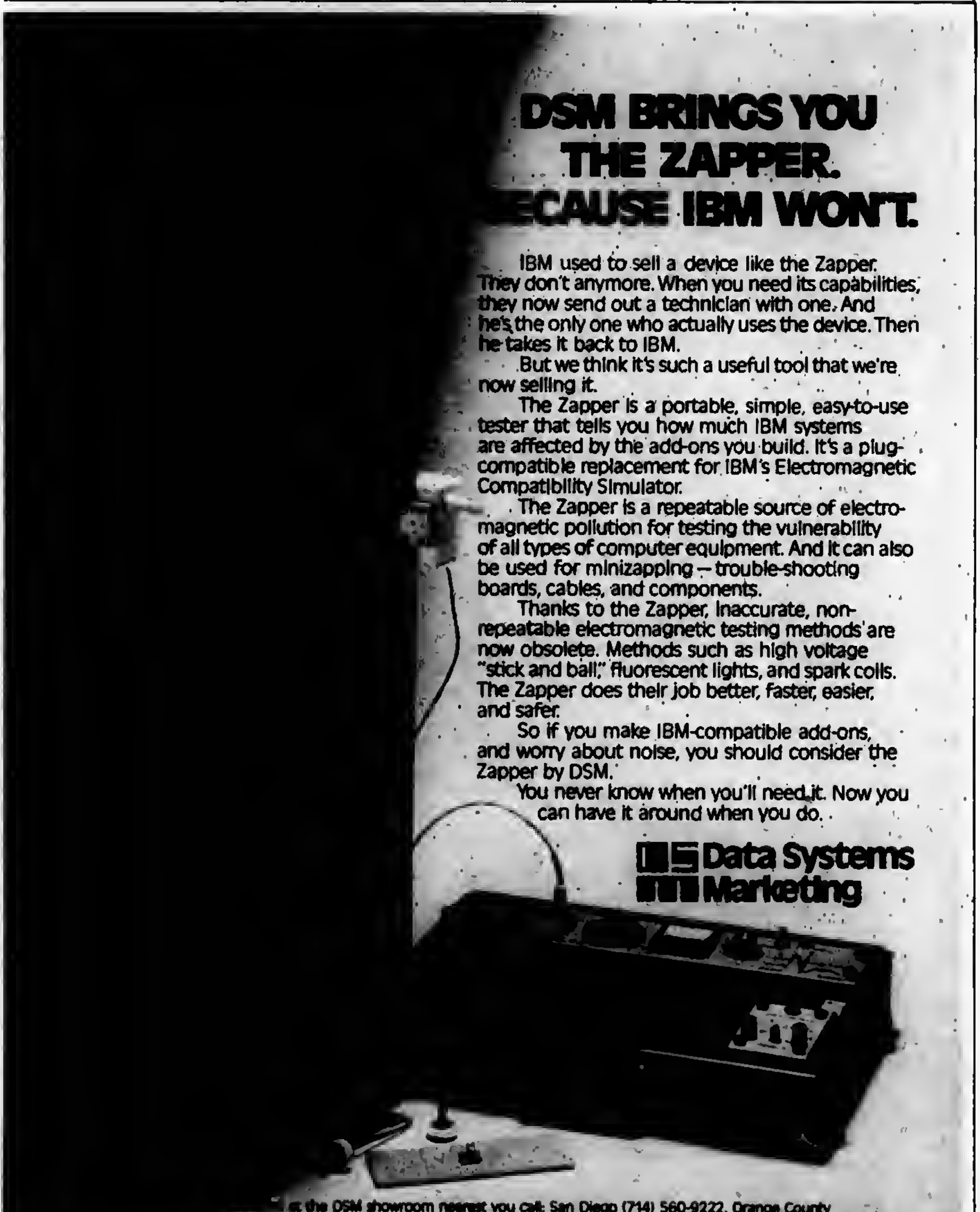

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Too Early for Christmas

Eight Judges to Return City Computer's 'Gifts'

By Tim Scannell
CW Staff

DALLAS — City officials here abruptly overruled a computer's decision to slip a little something extra into the paychecks of eight municipal judges when it was discovered the "bonuses" amounted to more than $14,000.

The error occurred during a changeover to new pay scales on Oct. 1, the beginning of the municipal government's fiscal year, according to Roy Allen, the city's data services director. City employees were slated to receive a 3% salary raise.

Because of a keypunch error, however, one administrative judge was given an additional $3,100 in his weekly paycheck and seven city judges were each handed an extra $1,600.

The blunder was uncovered by a sharp-eyed payroll clerk who noticed the unusual pay hikes while distributing the checks and promptly brought them to the attention of the city controller's office, Allen explained.

In addition, a number of terminated city employees, no longer on the municipal payroll, were paid 3% of what would have been a week's salary. Although Allen didn't know exactly how many ex-employees were included in the error, he dismissed this aspect of the problem as "minor" because "it only consists of between $7 and $10 per person."

Recipients of the municipal "windfall," including several whose checks were deposited directly into their bank accounts, will be expected to write personal checks equivalent to the overpaid amount.

"When we do make an error, we have to get around it by asking the person to write us a check," Allen pointed out. "That's the nature of working with an on-line system."

Allen said that a mistake such as the one that happened last month is a "one-time affair" and that the controller's office has several techniques to catch errors before the final checks are printed. Payroll registers are reviewed periodically, and the twin Itel Corp. AS/4 system is programmed to prepare a listing of those employees whose paychecks are 50% more than the normal amount.

For instance, "an abnormally high paycheck might be due to police overtime at football games or state fairs."

ACM Award Goes to Maker Of Reader for the Blind

NEW YORK — Raymond Kurzweil has won the Association for Computing Machinery's (ACM) annual $1,000 Grace Murray Hopper Award for his development of a computer system that reads printed pages aloud to the blind.

The Hopper Award is presented each year to an individual under age 30 whom ACM determines to have made the single most significant contribution to the computer industry. Univac donated the prize money this year.

The award recipient is the president of Kurzweil Computer Products, Inc. located in Cambridge, Mass. The award, presented since 1971 in honor of Hooper, the Cobol pioneer and U.S. Navy captain, will be conferred at ACM's annual conference in Washington, D.C. next month.

The 80-lb. device developed by Kurzweil shoots a beam of light across each page to be read, converts the reflected light into digital data for analysis through its built-in CPU and then transforms this information into synthetic speech. The unit allows blind people to "read" all printed material, supplanting the need for Braille translation, ACM stated.

Kurzweil's Achievements

ACM identified Kurzweil's basic contribution as the production of a commercially available, practical reading machine for the blind. The machine could not have been developed without another Kurzweil achievement, a set of rules contained within a minicomputer-stored program that prints characters in a variety of sizes and shapes for automatic recognition.

Kurzweil's accomplishment highlights a rapidly progressing area of research in special-purpose data entry. It encompasses optical character and speech recognition and joins such disparate disciplines as linguistics, electronics, physiology and information science.

The Kurzweil system incorporates an image enhancement capability that accentuates particular features on the page to improve recognition. The small processor within the unit separates the image into discrete character forms, recognizes alphabetic characters and groups them into words and then "computes" the pronunciation of each word.

Pronunciation is said to involve more than 1,000 linguistic rules plus 2,000 exceptions to the rules — all stored in the CPU memory. Further, a stress contour over each sentence is computed by a set of syntactical rules, providing appropriate inflections in the pronunciation process.

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Post Office Using DP to Route Private Trucks

By Marguerite Zientara
CW Staff

CHICAGO — The U.S. Postal Service, in an effort to cut mail delivery costs, recently implemented a computerized system to design the routes over which private truckers in 13 Midwestern states transport mail.

The system will replace the totally manual system of route schedulers working with mileage charts and maps, but will not replace the route schedulers themselves.

In tests conducted on routes between Chicago, St. Louis and Columbus, Ohio, the routes produced with the aid of a computer were less expensive than those done manually, according to Dan Curtis, senior distribution specialist for the Central Region Post Office here.

To implement the system, the Postal Service has accessed the St. Louis-based national communications network operated by McDonnell Douglas Automation Co. (McAuto). The software that performs the routing is the Interactive Vehicle Scheduling System (Ivess) from Decision Graphics of Nashville, Tenn. Decision Graphics contracted with McAuto to make the system available to businesses and institutions.

The data base from which the system operates contains the delivery locations on the truck routes that are to be designed. That information is digitized using the X and Y coordinates of each stop from a map. The route scheduler, who works with an interactive CRT graphics terminal, then tries to determine the most economical routes by inputting certain parameters that must be taken into consideration and which are not contained in the computer data base.

The U.S. Postal Service's vehicle routing system prepares a cost analysis of routing for city, regional or national routes.

Such considerations include the load capacities of the trucks in a fleet and the speed at which a truck must travel between two points in order to remain on schedule, as well as constraints unique to each post office. For example, a post office may not have a loading dock that will accept a 40-foot trailer or may not be open until a certain hour. Some post offices must receive their mail early enough for distribution and reshipment the same day.

All such information input by the route scheduler is summarized by Ivess which then, through optimization programs, indicates in map form the possible routes for the mail carriers.

The scheduler can also call up data on the terminal screen in tabular form. For example, if a scheduler keys in a particular route number, the CRT will display the delivery schedule for that route's delivery truck, including times of arrival and departure as well as the weight of the cargo to be carried.

One of the most important features of Ivess is the cost analysis it performs on each route, which helps schedulers determine the economic advantages of one route over another.

The system is expected to save the Postal Service money by reducing the number of miles traveled by each delivery truck and reducing the number of trucks used for mail delivery, a McDonnell Douglas spokesman said. Those reductions will result in lower fuel and maintenance costs per truck as well as less money paid to truck drivers, he noted.

McAuto's communications network is based on a mixture of IBM 370/168, IBM 3033 and Control Data Corp. Cyber mainframes, according to the spokesman. Each of the computers has between 6M and 8M bytes of main memory.

The Postal Service is presently using Tektronix, Inc. 4014 graphics terminals located at McAuto's offices in Chicago, but is considering purchasing its own terminals.

The Central Region Post Office here has 4,500 four-year contracts with private mail carriers. Each year, one-fourth of the contracts come up for renewal. The Central Region, which evaluates each route at the time of contract renewal, will now use Ivess to design less expensive routes before letting the contracts.

The system is currently operating in North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Missouri, Iowa, Wisconsin, Illinois, Michigan, Indiana, Ohio and Kentucky.

The Postal Service hopes to make the service nationwide in about four years, and in that case would expect to save about $5 million per year in mail delivery costs, the spokesman said.

Call for Papers

TENTH ANNUAL PITTSBURGH CONFERENCE ON MODELING AND SIMULATION, Pittsburgh, Pa. April 25-27, 1979.

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Two copies of titles, authors, all authors' addresses, abstracts and summaries should be submitted by Jan. 31. The abstract should be approximately 50 words in length and the summary should be of sufficient length and detail to permit careful evaluation. Identify one author as the correspondent for the paper.

All correspondence should be directed to William O. Vogt or Merlin H. Mickle, Modeling and Simulation Conference, 348 Benedum Engineering Hall, University of Pittsburgh, Pittsburgh, Pa. 15261.

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System Keeps Doctors Informed

Net Giving Help to Babies With Birth Defects

By Marguerite Zientara
CW Staff

BOSTON — Babies born with birth defects have gained new hope because a computerized information system is telling doctors about each known birth defect. The system also fills them in on possible hidden, related defects that in the past might have gone unnoticed.

The Birth Defects Information System (BDIS), funded by the National Foundation March of Dimes and developed in conjunction with Tufts University School of Medicine and MIT, has been officially in operation for one month. It was tested for more than a year [CW, Jan. 24, 1977].

The nationwide network, presently accessed by six hospitals with several per week being added, contains current data on more than 1,400 physical or biochemical birth defects.

The system was designed to help doctors save and treat more effectively the 250,000 American babies born each year with birth defects. Presently, more than 62,000 children a year die of birth defects.

Additional Data

Once a doctor has determined a baby's birth defect, the system furnishes data on possible hidden defects; any existing inheritance pattern, chromosomal abnormalities, life expectancy, specific treatment available and a list of references for further information, according to Dr. Sydney S. Gellis of Tufts New England Medical Center.

"If you can't see the other birth defects, they could be ignored or missed until it's too late," Dr. Arthur Salisbury, the National Foundation's vice-president of medical services, said.

A second program within the system, now running on a trial basis in four birth defects, centers, will assist doctors in making a diagnosis. "It's fairly common that doctors are unable to diagnose birth defects, especially when a doctor doesn't come across them too often," Salisbury noted.

Using that program, a doctor inputs the findings of a patient's condition. The system then offers the most likely diagnoses and suggests additional questions to help narrow the possibilities.

A third program, still in the planning stages, would serve as an early warning system on a national and possibly a worldwide basis.

In that program, individuals would report birth defects as they appeared; the defects would be input to the data base. "If sudden clustering should come up, like the thalidomide disaster, one would be warned early and not be waiting until 5,000 children were severely damaged," Gellis said.

The computer also stores data on defects such as hyperthyroidism, which doesn't appear until a child is several months old. "In certain conditions, a number of babies would seem normal from three months up to a year," Gellis pointed out.

The data was compiled by 436 doctors from 22 countries, all of whom are specialists in their fields.

"We'd like to see a terminal in every hospital in the country and in every birth defect center, whether it's related to a hospital or not," Gellis said. There is approximately one birth defect center for each state, he noted.

The 6M-byte IBM 370/168 that is the basis of the system is located at MIT and is accessible through the Telenet, Inc. communications network, according to Seymour Small, associate director of the Center for Birth Defect Information Services, which administers the system.

Most of the six terminals now hooked up to the system are impact printing 300 bit/sec Ascii terminals that can access the system from 9 a.m. to midnight.

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Instant Rankings Provided

System Scores Events at Gymnast Competition

By Ann Dooley
CW Staff

STRASBOURG, France — As more than 400 athletes representing 40 United Nations countries competed in the 19th World Gymnastics Championships here recently, their competition scores were entered in an automated scoring system that provided almost instantaneous results and rankings.

Several thousand scores from 10 different categories of events in the week-long competition were entered into the Level 6/33 system provided by CII Honeywell Bull, Honeywell, Inc.'s French computer associate.

Unofficial Scorekeeper

The system was used as an unofficial scorekeeper and to provide fast and accurate scoring results to the 400 newspapers and television stations covering the event.

As each competitor finished his performance, the system provided intermediate placings in a constantly updated results table which could be superimposed, as desired, on the competition images being broadcast by a television network. The results were supplied in video signal form for this purpose from a character generator linked to the on-site Level 6.

Each participating country entered eight men in six different categories and six women in four different categories. Each athlete was usually allowed several attempts or performances in one competition.

Crisis Sparked by Strike

Although a large amount of information was entered very quickly into the system, no problem occurred with the automated scoring system, a Honeywell spokesman said.

The only crisis in the contest occurred when the French television networks went on strike, hampering broadcasting abilities. The problem was overcome when the American Broadcasting Corp. network began using French network facilities to continue broadcasting.

Each contestant's performance was scored by six judges. The chief judge collected all the written scores and entered them into the Level 6 via a CRT.

The system was programmed to discard the highest and lowest scores of each contestant in case of any bias on the part of an individual judge. The system then averaged the remaining scores and provided a final score and intermediate ranking in relation to the athlete's competitors.

Concurrent Scoring

The Level 6, which operated in a real-time multiprogramming mode, handled several competitions taking place at the same time in different locations.

Athlete's placings, besides being shown in a video mode, were also printed out every half day on a 300 line/min Honeywell printer.

More than 150,000 hard copies were generated during the total competition period.

The automated scoring system, which was handled completely by Honeywell Bull, is similar to the Honeywell Racer program that computes runners' race times [CW Oct. 16].

Honeywell has used this system to track racers' times in the Boston Marathon and the recent Boston Bonne Bell Mini Marathon (see story on Page 7).

Honeywell donated both computer time and equipment for all three competitions.

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Forum to Study DPers' Choices, Risks in '80s

NEW YORK — New choices and new risks for the DP user in the 1980s will be the subject of the International Information Technology Institute's Future Systems forum, which will be held here Jan. 24-26.

Technologists, systems architects, industry analysts and users will examine the myriad of systems and communications architectures opening for users.

The program will also include speakers from the software and services industry and the communications industry.

The forum will take place at the Barbizon Plaza Hotel's Executive Conference Theatre.

Among the questions to be addressed are:

- Systems alternatives in a mixed-vendor environment as software increasingly differentiates look-alike hardware.
- Economic alternatives for the user faced with attractive products, but burdened with purchased hardware and application commitments.
- User technology alternatives and trends in price/performance of hardware, software and communications.
- Potential and problems of distributed processing and data bases.
- Management control and systems planning to optimize hardware/software investments.

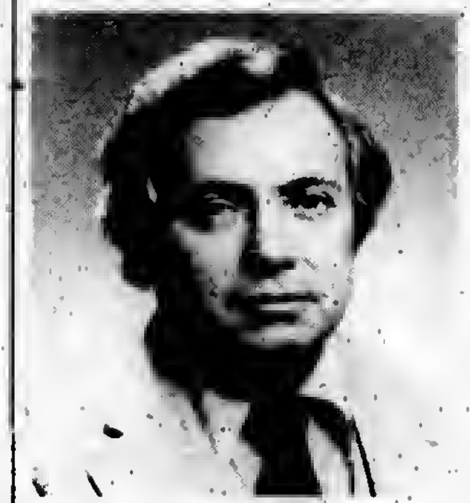
Charles P. Lecht, president of Advanced Computer Techniques Corp. (ACT) and author of *The Waves of Change* and *Tsunami*, will be the keynote speaker for the forum. Lecht will be joined by Robert T. Fertig, vice-president and head of the ACT Technology Analysis Group.

Patrick J. McGovern of International Data Group will forecast products expected to arrive on the market in the 1980s. C. Oakley Mertz, International Data Corp.'s vice-president for research, will discuss user migration motivation and distributed processing.

The evolving state of DP management, applications and the planning necessary to ensure the best payoff from organizations investing in systems will be covered by Richard L. Nolan, chairman of Nolan, Norton & Co., a consulting organization which specializes in information systems management problems and resource employment.

The institute is accepting registrations at $600 each through P.O. Box 265, Newtonville, Mass. 02160.

Richard L. Nolan



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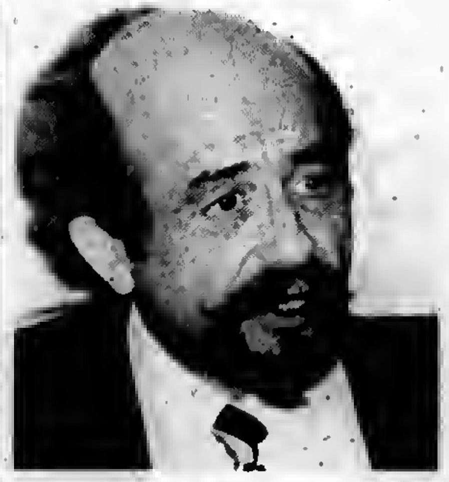

Charles P. Lecht

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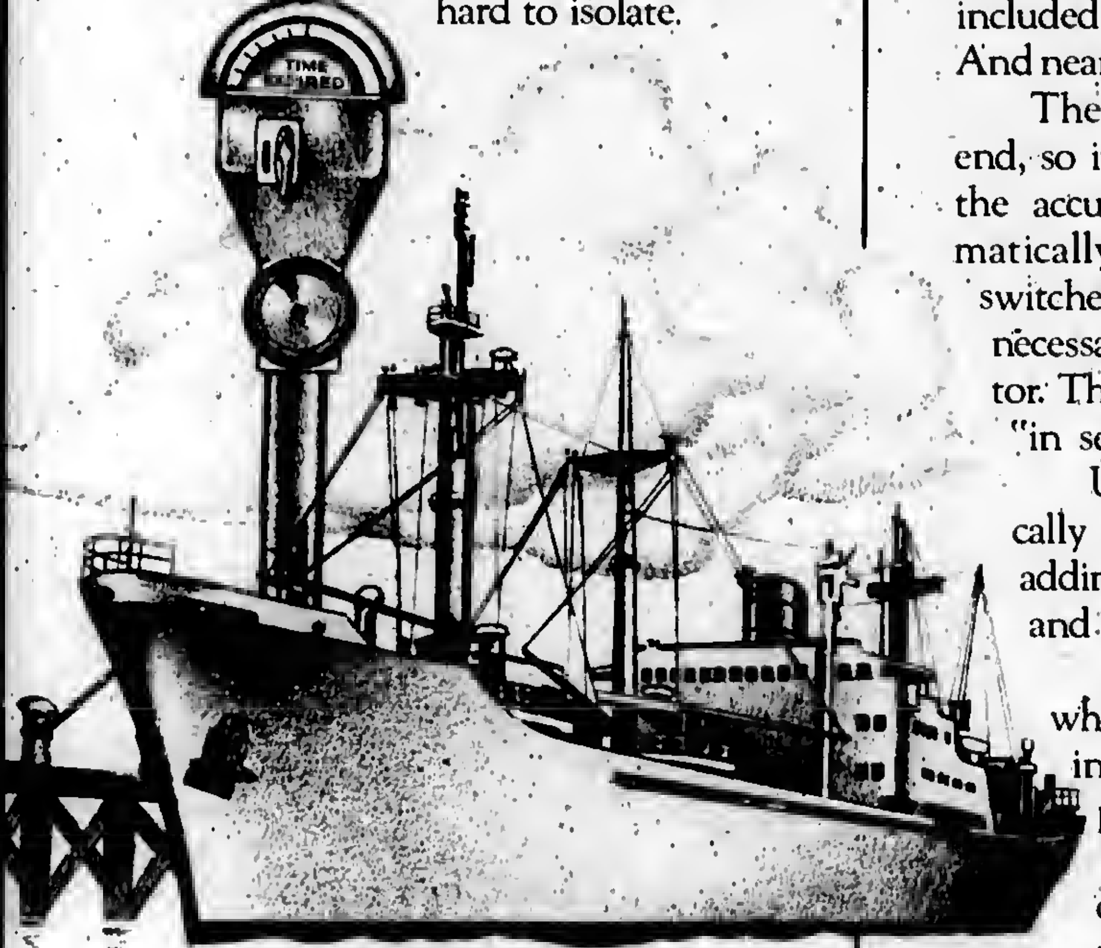

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Schoolchildren to Monitor Homes' Energy Use

By Marguerite Zientara
CW Staff

NEWPORT BEACH, Calif. – "Little brother is watching you" may well become the byword here in January when schoolchildren start using CRT terminals installed in their classrooms to monitor their families' daily energy consumption.

The brainchild of the Community Energy Conservation Association (Ceca) the project is now being implemented in the fourth through sixth grades at the Top of the World School in nearby Laguna Beach. Ceca is a year-old voluntary, community-based and privately funded energy conservation program whose philosophy is that the only solution to this country's energy problems lies in conservation. Ceca believes the only way to develop the conservation ethic in citizens' minds is to start in the elementary schools, as this program is doing.

Under the program, students living in 175 Newport Beach homes will be able to log onto computer terminals every morning in their classrooms and see instantly how much gas and electricity were used in their homes the day before, when it was used and how much it cost.

By studying peak periods of energy use, students and their parents will learn how to reschedule their energy-consuming activities such as washing clothes, running the dishwasher, showering and using electric toothbrushes, according to a Ceca spokesman. For example, the computer will tell a child whether the family's washing machine would have been used more efficiently if the loads had been spaced out or done at different times.

Remote Readout Units

Implementation of the program requires the installation of remote readout devices on the gas and electric meters of every participating home, according to Jim Gamber, DP manager at Engineering Supervision Co. (Esco), which is coordinating the project. Information gathered by the devices will be sent over the homes' private telephone lines to a Data General Corp. Nova minicomputer with 64K bytes of memory located at a Pacific Telephone Co. substation.

The Nova drives a custom-built multiplexer that can read each of these telephone lines every second, according to Gamber. "All the multiplexer measures is the resistance of each line, and from that the Nova deduces whether each of the 'read' switches is open or closed," Gamber explained.

If there has been a change in the condition of the switch from the previous second's reading, he said, the Nova will know whether the gas or electricity in a home has been turned on or off.

Also connected to the Nova will be a Digital Equipment Corp. Dasher printer operating at 30 char./sec. The unit will print out any exceptional conditions as they occur, such as a telephone line going down.

'Energy Report Cards'

The data collected by the Nova will be transmitted over a leased telephone line to a 96K-word Prime Computer, Inc. 300 minicomputer located at Esco's offices in Newport Beach. There the data will be worked on statistically.

After statistics have been gathered and processed, the information will be transmitted over telephone lines to six Lear Siegler, Inc. ADM-3 terminals located in the classrooms. At that point, a student will be able to see, in graph and chart form, "the impact of whatever his actions were," according to Gamber.

A Decwriter LA 18 printer in Esco's offices will, among other things, generate "energy report cards" to tell the students whether they are improving in their energy conservation efforts, Gamber said. It will also furnish hard copies of the information on the CRTs to the classroom teachers as they need them.

Since the monitoring devices cannot be read while family members are talking on the telephone, Gamber explained, there will be missing data values in the total data set. To compensate for such data losses, a software program will extrapolate such data from previous and succeeding data.

As one might expect in such a project, Gamber said a lot of technical problems are showing up at the substation because the project is not a standard telephone-company function.

"The standard procedures they have in the phone company don't apply here at all," he noted, "so technical and engineering people have been developing unique procedures for the servicemen to use within the substation."

"Pacific Telephone has been very innovative in developing approaches to working this computer system into its existing hardware," he noted, adding "it's not as if you put two plugs together and away it goes."

Although the "real thing" won't be operational until next year, students are presently able to simulate energy reading in the classroom. With the one terminal now installed at the school, they can indicate appliances used and hours of use in a simulation that is processed by Esco's Prime computer.

Funded by Donations

The total cost of the program is "around half a million dollars," Gamber estimated, including the salaries of two full-time teachers. It is being funded totally by donations from Fluor Corp., General Telephone Co., Southern California Edison Co. and Southern California Gas Co. Esco is donating its services and expertise to the project as well.

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N.Y. ACM Chapter Opens Two-Part Seminars to All

NEW YORK – Helping DP professionals increase their computer-related skills and keep abreast of the latest hardware and software developments is the purpose of a series of two-part seminars sponsored by the local chapter of the Association for Computing Machinery (ACM) here.

The seminars will be held on various evenings from 6 p.m. to 9 p.m. at the Roosevelt Hotel and will be open to both New York and national ACM members as well as to nonmembers.

The first seminar, scheduled for Nov. 22 and Nov. 30, will discuss the basic principles of computer simulation and will include a detailed comparison of the various simulation languages. Nabil Adam, an assistant professor at Rutgers University and course moderator, will cover computer modeling programs, verification and validation techniques and analysis of the final program.

The shortcomings of the Pascal programming language in relation to microcomputers and the benefits of using the standard C language will be the topic on Dec. 5 and 12. P.J. Plauger, president of Whitesmiths, Ltd., a software consulting firm, will address the session and explore the comparative anatomy of the C and Pascal languages.

A detailed discussion of the machine-independent nature of the abstract "C machine" will highlight the session, an ACM spokesman noted.

Advanced data base management systems, large-scale networks and the problems of artificial intelligence will be the focus of meetings on Dec. 11 and Dec. 18 dealing with the theories behind self-organizing parallel processsors.

The course will be proctored by Herbert Sullivan, a consultant specializing in computer architecture and word processing systems, and T.R. Bashkow, a professor in Columbia University's Department of Electrical Engineering and Computer Science.

Finally, on Dec. 13 and Dec. 20, the New York ACM will host a session on microprocessors and personal computing. The course will be directed by Robert Wine, a senior consultant for Advanced Computer Techniques Corp., and will cover microcomputer hardware, small business systems, distributed processing and the various econometric trade-offs of using a microprocessor.

The registration fees for each of the courses are $20 for chapter members, $30 for national members, $40 for nonmembers, and $10 for full-time students. Registration forms and additional information are available from NYC/ACM, Professional Development, P.O. Box 245, New York, N.Y. 10017.

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But Project Off to Slow Start

Michigan Testing Social Service Referral Plan

By Ann Dooley
CW Staff

LANSING, Mich. — The State Department of Social Services here is conducting a $3 million pilot project called Network which, if successful, will eliminate duplication of service listings among referral agencies and expand the known choices of services to those in need of help.

But so far, the DP project is off to a slow start.

Many of the employees in the referral agencies are hesitant to use the system, preferring to rely on their own memories or standard procedures, according to Elaine Demps, spokeswoman for the Michigan Human Services Network project.

Although referral agency staffers have been trained to use the system, its CRTs are sometimes placed in inconvenient places or workers simply refuse to try the system, Demps said.

A decision on whether to expand the system, begun in June, or to drop it entirely must be made by the end of February, but the time allotted is not enough to get people to use the equipment, according to Demps, who noted that currently staffers only use the system as a last resort, not as a daily tool.

Once they use Network, they are impressed with its simplicity and ease, but they seem to rely on it only for the more difficult cases, she said. While the adjustment phase has been slower than anticipated, a great deal of work is being done within the agencies to encourage equipment use so that some significant results can be shown when the project comes under review.

The only statewide resource center of its kind, Network was implemented to help people in need of help find the right kind of service source from among the hundreds of human service agencies, most of which operate independently. The duplication of effort among referral agencies, as well as the duplication of information, only increases the bureaucratic problems and increases the chance that people will be sent to the wrong service agency.

In addition, duplication wastes agencies' money. In Michigan, it is estimated that at least $4.25 million is spent annually in compiling and maintaining card files and service directories and much of that is duplicated effort and information, Demps said.

More Than 3,000 Agencies

There are more than 3,000 public and private social help agencies in the state, dealing in areas ranging from homemaking to day care to interpretation, and many of their functions overlap.

The Network system was developed as a shared computer system between local and state human service referral agencies with the objective of providing comprehensive, accurate and up-to-date data on human service providers. Nearly two years of background work and planning were undertaken before the project started up, Demps noted.

Currently, 52 Honeywell, Inc. VIP 7700 CRTs have been placed in 44 agencies in several countries around the Detroit area. Persons seeking help can come in or call one of the referral agencies, and a trained staffer accesses Network's automated resource file.

Almost Instant Retrieval

The system allows almost instant information retrieval as well as nearly instant update of information. Network is programmed to geographically locate specific providers that meet the needs of someone in need of help in a certain location. After the information and referral worker indicates the services needed and specifies the area, the Network system responds with a list of particular agencies that meet those needs in the specified area.

The system also ranks the providers as to which would be the most beneficial to the person and indicates service details such as whether a nursing home is at full capacity, has a waiting list or has vacancies.

Network participants themselves share in keeping one comprehensive resource file up-to-date so that eventually a constant flow of update information will be sent to the central cite as a worker finds out some new information about a provider. Update information can include anything from a change of operating hours to a change in provider service.

Service agencies can also contact Network directly with any new information and Network staffers will regularly send service agencies records to verify for accuracy of informational data, Demps noted.

If the system becomes fully operational, Demps estimates that Network will handle at least four million calls a year and will include 350 terminals throughout the state. The system will also be used as a report mechanism to determine what help people are requesting and in what areas of the state.

CRT Locations

The CRTs will be placed in libraries, hospitals, mental health centers, courts and any other places people might contact for help. Only those agencies with substantial information and referral requests will be given terminals, but other agencies can use the system by using a nearby terminal, Demps said.

The agency CRTs send and receive information from a Honeywell 6610 Series computer with 256K of memory. The Network system also includes a Honeywell printer, four disk drives and two front-end network processors. It is Cobol-based and runs on a Honeywell GCOS operating system.

Although the Network system is free to those seeking assistance, referral agencies lease a terminal for approximately $2,000 a year. This fee includes costs associated with installation, maintenance and data communications.

Ruling on S&L Services Due in Six Months to Year

WASHINGTON, D.C. — It will be six months to a year before a final ruling is made on whether federal savings and loan (S&L) associations may continue to offer remote service unit (RSU) services to customers.

The issue stems from a lawsuit filed in January 1976 by the Independent Bankers Association of America (IBAA) against the Federal Home Loan Bank Board (FHLBB), the regulatory agency for federal S&Ls [CW, June 26].

The suit claimed the FHLBB had illegally entered the field of banking by giving S&Ls demand-deposit capability via electronic tellers. According to the suit, that violated a statutory prohibition against S&Ls offering checking accounts.

The bank board has been authorizing remote teller facilities for S&Ls under temporary regulations on a case-by-case "experimental" basis since 1974. On July 1 a set of permanent FHLBB regulations governing RSU use became effective.

On the preceding day, a U.S. District Court judge here had ruled in favor of the S&Ls, maintaining that the bank board's regulation of RSUs is valid for two reasons [CW, July 10].

Two Findings

First, the court found the regulation is within the FHLBB's proper discretion and does not violate the statutory prohibition against the use of checks for federal S&Ls.

Second, the court ruled the plastic access card for RSU transactions does not meet the Uniform Commercial Code's (UCC) definition of "check" and therefore does not violate the checking regulation.

UCC defines "check" as "a negotiable instrument drawn on a bank and payable on demand."

The IBAA appealed the court's decision at the end of the summer and now awaits the FHLBB's reply brief, due Nov. 2. Two weeks after that, IBAA will file its reply brief, and two to four months after that the case will be submitted and argued in the U.S. Court of Appeals, according to Leonard Rubin, IBAA attorney with the firm of Lawler, Kent & Eisenberg.

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Los Angeles Votes to Keep Police Network Plan

By Marguerite Zientara
CW Staff

LOS ANGELES — Los Angeles has decided to proceed with the development of a computerized police communications network [CW, May 8] in spite of funding problems and protests by civil libertarians.

In a recent "turning-point decision," the Los Angeles City Council voted to proceed with the Emergency Command Control Communications System (ECCCS) even if a special tax collection proposal to help pay for the system is challenged legally and ruled invalid by the courts.

If that should happen, the City Council plans to use general treasury funds to finance the $40 million project.

The system, planned to be operational by 1981, would put CRT terminals in all police vehicles, improve the citywide radio communications system and include a computerized central police dispatching system.

Objections to System

Objections to the system concern its cost, doubts about its necessity and privacy considerations. According to the National Commission on Law Enforcement and Social Justice (NCLE), the project is "an attempt by the [Los Angeles Police Department (LAPD)] to increase the secret dossier system on California citizens."

NCLE cited an 80% crime increase in Los Angeles from 1961 to 1970 "even though millions of dollars were spent on computers designed to reduce crime."

The Coalition Against Police Abuse called the system "just another intelligence and paramilitary apparatus that will be used to violate our civil rights and maintain control over our lives."

The Southern California chapter of the American Civil Liberties Union (ACLU) called the equipment "overpriced, unnecessary and dangerous to civil liberties," according to Ramona Ripston, the chapter's executive director.

In a rebuttal to a pro-ECCCS radio station, the ACLU said it was concerned about the proposed system's "potential for invasions of privacy and political surveillance . . . We doubt the wisdom of giving any police agency access to more information than [it needs] for legitimate law enforcement."

Ripston fears such privacy invasions would occur in a system tied into state or federal computerized information systems. "If they're going to spend money, we'd rather see more men on the beat and better community relations in so-called high crime areas," Ripston said.

The system will tie into the State of California's law enforcement teletypewriter system as well as the National Crime Information Center (NCIC), according to Capt. David Burney, who is in charge of the project.

Burney pointed out that the ECCCS system will not add any criminal information data banks, but only data links to connect patrol cars with existing information networks. This will aid law enforcement officers in the verification of information, he said.

The existing computerized data banks include arrest records submitted through the court system to the state, as well as "wanted" information stemming from court-issued warrants or "sufficient felony evidence to indicate a suspect in a crime," according to Burney.

The computerized state network accepts only information concerning felonies and serious misdemeanors.

'Probable Cause' Record

The only computerized file containing information on noncriminal citizens, Burney explained, stems from an LAPD requirement; when a policeman stops somebody "with probable cause," but not sufficient evidence for an arrest, the officer must make a record of it.

Such a record, according to Burney, contains identifying information from the driver's license as well as the reason the person was stopped. The Social Security number, which privacy advocates see as one "key" to merging computerized files, is not included in either the file or on California drivers' licenses.

The LAPD does have noncomputerized files on persons who are suspected of criminal activity but who have not been convicted, Burney said.

If a person is arrested in California but not convicted, his name will not be purged from the arrest record unless he requests its removal. Although there is a law allowing the arrestee to request such a purge, there is no law requiring the police department or the court to inform him of his right.

In the case of the arrest of a person under warrant, Burney explained, the system is designed to automatically purge the warrant at the time of the arrest.

In response to the idea that the LAPD should spend more money funding "men on the beat" instead of computer hardware, Burney said "the way policework operates is obviously on information — that's the only way you're going to find out about a crime.

"In organizations our size — and I'm sure it's true in large cities like Boston, New York and Chicago — you just can't pass information around between investigators and other people properly without centralizing it so everybody has access to it. That's really the rationale for a computerized data base," Burney said.

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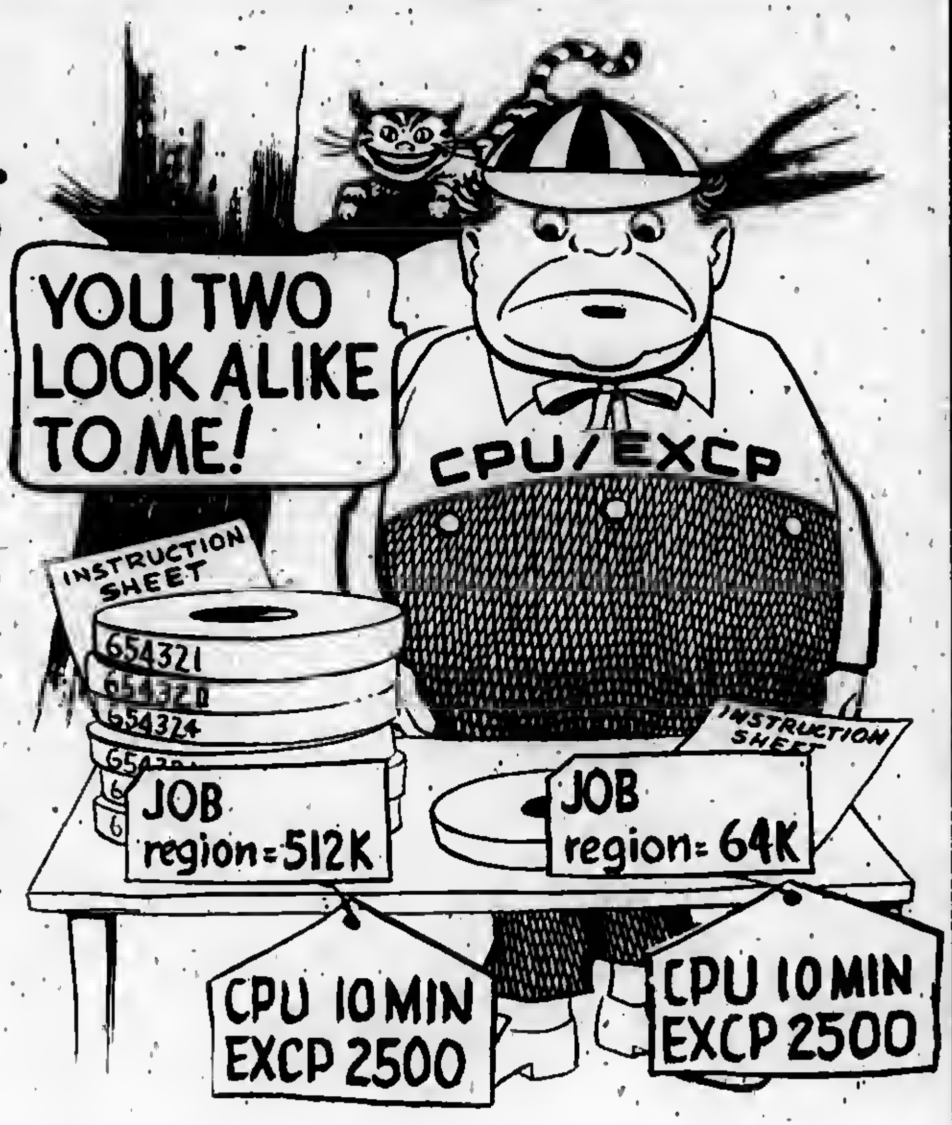

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The PACE for Today...and Tomorrow

Analyzes Psychological Tests

Program Fingers Prisoners Likely to Escape

By Marguerite Zientara
CW Staff

ATLANTA — Fewer than half the number of inmates escaped from Georgia prisons in 1978 than in 1973 as a result of a computerized program that indicates prisoner escape risks.

Since it costs between $5,000 and $70,000 to search for each escaped prisoner, depending on whether helicopters are used, the system has saved the prisons a possible $1 million per year, according to Dr. Herbert Eber, developer of the program and president of Psychological Resources, Inc. here.

The program, in operation in Georgia since 1974, also exists in Oklahoma and Colorado and is in testing stages in Maine.

Tests Analyzed

Eber developed the computerized program in response to a request in 1971 from the Georgia Diagnostic and Classification Center, an inmate-receiving institution that determines what prisons convicts will enter. The center felt tests results could be used more effectively, and Eber's program proved that theory right.

The system analyzes the results of several standard psychological tests that measure achievement, intelligence, personality, motivation and psychopathology. Although the tests were given to entering prison inmates before the program's inception, the results were "filed away" and never used for such things as predicting escape risks, Eber said.

Test results are fed into a computer that outputs 1-1/2 page narrative describing each prisoner.

Wardens, however, don't have the time to read such volumes of paper on large numbers of prisoners and to then analyze the information, Eber explained. Consequently, the system flags certain items of information and prints out four lists for quick reference.

The lists indicate escape risks, inmates needing psychological attention, suicide risks and inmates who lied about themselves on the tests, Eber said.

Work in Community

The system, which has analyzed 35,000 inmates since its inception, tests prisoners as they enter prison. In Colorado an inmate is retested "if there is reason to believe there's change" in the inmate's orientation, Eber said.

In some situations, Eber added, "we work in the community prior to sentencing." The system can indicate to a judge what risks would be involved if an offender were put on probation rather than sentenced to jail. It can tell a judge what community services and resources — psychiatric, supervisory, educational — would be needed and how to access them, Eber said.

The system is used in state, county and local jails and is typically funded by the state, according to Eber.

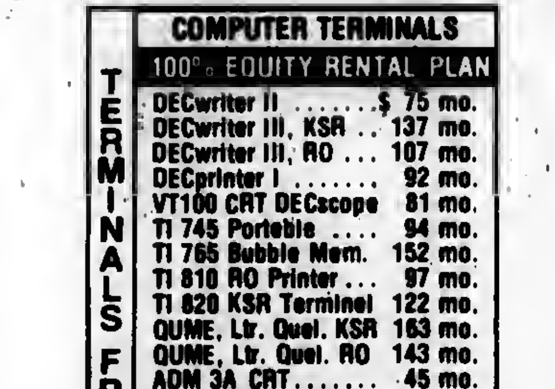
Colorado has the biggest and most expensive program, according to Eber, and uses the results of "seven or eight" psychological tests. Other states use three or four tests.

In addition to the Diagnostic Center, more than 100 jails in Georgia use the system. Oklahoma has eight or nine major jails in the system after one year.

Colorado, also using it for a year, has three major prisons and "a lot of little jails" in the system. One country jail in Maine has been testing the system for three months.

Oklahoma's data is processed on a Data General Corp. 96K-byte Nova 3 minicomputer. In Colorado, a 10M-byte Nova 210 is used and in Georgia data is sent to Psychological Resources, where two 64K-byte Nova 1200s process it.

At all sites, Model 4200 optic readers from Chatsworth Data Corp. read the test answer sheets.



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Terminology Seen Snagging Data Flow Efforts

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — More precise terminology and a better understanding of the issues involved are essential to greater U.S. cooperation in the international effort to resolve the transborder data flow controversy, according to a recent analysis.

The analysis, the product of an American Federation of Information Processing Societies (Afips) panel on transborder data flow, was presented to the State Department in May and made public here late last month.

The study is in the form of 12 "Observations on Transborder Data Flow." It attempts to "define what the issues are," an Afips spokesman said.

"The Afips panel is addressing the technical aspects [of transborder data flow] in hopes of making them more susceptible to clear analysis," according to Alexander D. Roth, director of Afips' Washington office and a member of the panel.

The Afips observations were distributed to the interagency Task Force on Transborder Data Flow and the State Department's Subcommittee on Transnational Data Flows of the Advisory Committee on Transnational Enterprises.

The task force is a government panel established by the State Department and chartered by a National Security Council directive. It includes representatives from the departments of State, Justice and Defense, the Federal Communications Commission, the National Bureau of Standards, the National Security Council and the National Telecommunications and Information Administration.

The task force is the primary formulator of U.S. policy in the area of transborder data flow. The State Department Subcommittee on Transnational Data Flows is an advisory group of individuals from the private sector organized under the guidelines of the Public Advisory Act.

'Excellent Analysis'

A State Department spokesman for the two groups described the Afips document as "an excellent analysis of the problem." The observations constitute "one of the best papers I've seen on this subject," according to Morris H. Crawford, director of the department's Office of Science and Technology Affairs.

"We used a lot of their thinking in drawing up our position on the OECD effort" — the ongoing attempt by the Organization for Economic Cooperation and Development to formulate an international agreement on transborder data flow [CW, Aug. 28].

Afips' Roth said the panel's observations were just one product of its work and that other, private communications have been delivered to the State Department by panel members.

The panel, chaired by Prof. Rein Turn of California State University in Northridge, was recently organized into 11 working groups whose various tasks should be completed by April, when the panel hopes to produce a final report.

The panel's observations reflect the views of its members and do not constitute an official Afips position statement, Roth noted. He called the panel's work one of the first well-defined and well organized efforts to consider the "nuances of transborder data flow."

A primary finding of the panel, according to Roth, is that terminology is causing confusion. For example, what is called "privacy protection" in the U.S. is called "data protection" in Europe.

A problem arises, the panel said, when it is not clear whether the European term covers all types of data — not just personal information and not only automated records, but also any international transmission of information, which could also affect newspapers, television broadcasts, and even books and journals.

In addition, some transborder data flow proposals might extend privacy/data protection to cover "legal persons" (corporations and various other organizations). "This certainly would have significant impacts on marketing, product development and pricing and on competition in general in national settings," the panel observed.

Further, broadly written statutes that would include nonautomated transmissions might succeed in reducing circumvention of data protection restrictions, but might also provide an occasion for "wholesale censorship," the panel warned.

Another problem in terminology, the panel said, is to clearly define who would be responsible for meeting data protection requirements — the organization in the home country that contracts for data processing services abroad, the service vendor or both.

Sovereignty Concerns

Addressing the impetus for data protection laws, the Afips group said "national sovereignty/vulnerability concerns of some countries regarding transmission from their countries of large amounts of personal and business data for processing and storage abroad must be taken seriously.

"The development of credible techniques to assure security, integrity and continuous availability of this data and the data processing support (an important objective of the vendors of transborder data processing services) may be able to alleviate these concerns."

No Absolute Security

However, the panel noted, "it is not likely that it is possible at the present time to provide absolute security in a computer-based recordkeeping system, especially so in a multiuser, transnational system involving processing facilities and communications systems in several countries. Thus," it concluded, "any legal requirements for very high degrees of security are infeasible to comply with."

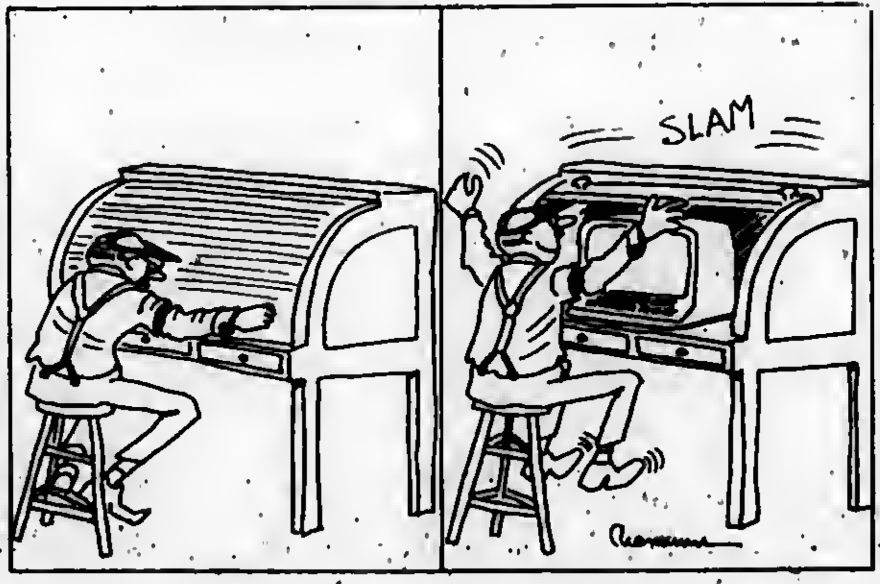
The panel also advised government entities that although the possibility of data havens in countries with no or fewer data protection requirements is real, "the state of the art of compliance verification is not very advanced and an organization could evade privacy protection requirements in its home country just as effectively."

Groundless Fears

Turning to the concerns of private organizations, the panel called groundless the fear on the part of multinational corporations that certain countries would use data protection laws to institute curbs against foreign DP service vendors.

"These laws presently apply only to personal data on individuals and, thus, cover a relatively small fraction of data flows over computer communications networks," the panel noted.

Tariffs, duties and high charges for communications services in the country seeking protectionism may be a more likely means, it added.



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U.S. Says It Won't Support Draft Transborder Data Pact

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The State Department has notified the Council of Europe (COE) that the U.S. is not prepared to back the present draft of the COE International Convention on Data Privacy.

In a position paper presented at a recent meeting of the COE committee drafting the agreement on transborder data flow and personal privacy protection, the State Department said the U.S. finds certain provisions of the agreement troublesome and unacceptable.

The U.S. position paper, not yet made public, reportedly was received with disappointment by the committee members, who had hoped for a more favorable U.S. response to the draft agreement.

The U.S. told the committee at the Oct. 16 meeting at COE headquarters in Strasbourg, France, that "the draft convention does not fit our conception of what an international agreement should be like at this stage of the game," according to Morris H. Crawford, director of the State Department's Office of Science and Technology Affairs.

The present working version of the agreement is "inadequate," Crawford said, because it addresses only records subject to automated data processing. The U.S. is working toward legislation to protect individual records and personal privacy regardless of the method of storage or processing.

'Most Telling Defect'

But "the most telling defect of the Council of Europe's conception of a convention," according to Crawford, "is that it would require, in our reading of it, a fairly elaborate enforcement mechanism," a mechanism that "seems excessive" to U.S. policymakers.

Countries that sign such an agreement would have to institute elaborate policing measures to ensure reciprocal data protection from other signatories, he said.

The State Department is also concerned about an enforcement provision in the draft that assumes a "central authority" would be set up in each country to guarantee compliance with the data protection law.

There would be "a potential for the central authority to gather into itself large amounts of personal information with no restrictions" on its use, according to the author of the U.S. position paper, Lucy A. Hummer, State Department Deputy Assistant legal advisor.

The draft agreement envisions the "central authority" in each country acting as a clearinghouse for all requests from citizens of foreign countries for information concerning their personal records maintained abroad. The entity would also be responsible for investigating alleged misuses of personal records.

Such an entity, Hummer pointed out, could be a considerable threat to personal privacy. Although the U.S. would not agree to such a proposal, according to Hummer, it is in line with the thinking in European countries, where governments tend to act as "pater familias," assuming extensive social responsibility for their citizens.

The U.S. also has strong objections to the draft convention's "elaborate registration requirement," Hummer said. The COE committee is recommending government registration of individual data files and record systems, a position the U.S. finds "troublesome" and contrary to the thrust of this country's privacy laws, she added.

Hummer would not speculate on what effect the U.S. position might have on the COE draft committee, pointing out the agreement is aimed only at European countries. But, she said, the COE does hope non-European countries will find the final agreement acceptable and become signatories.

Disagreement on Draft

The COE, comprised of 20 Western European countries, has been working on the data protection convention for several years, and more meetings on the subject are scheduled.

Crawford noted there is a "substantial area of disagreement" within the COE itself over the present draft of the convention. Considering the disparity of national legislation on privacy and data flow in Europe, the dissension is not surprising, he observed.

Explaining that COE members are trying to embrace the various national laws in one agreement, he said that "as a diplomatic problem, it is almost an impossible task they have set for themselves."

Although the COE might eventually produce a document acceptable to its member countries, if the present version is any example "the convention would have to be changed substantially for the U.S. to become a signatory to it," Crawford said.

The convention is still in the drafting stage and might very well undertake the "substantial changes" necessary to gain U.S. acceptance, he also noted.

Monthly Covers Data Moving Across Borders

BROOKLINE, Mass. — A monthly newsletter entirely devoted to the subject of transborder data flow is being published by Information Gatekeepers, Inc. here.

Information Gatekeepers is introducing the "TDF Newsletter" "to keep business and government apprised of activities as they happen around the world," according to the firm's president, Dr. Paul Polishuk. He said the periodical has the following objectives:

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Management, Communications Faulted

Report Finds Causes for Colleges' System Bugs

By Tim Scannell
CW Staff

CASTLETON, Vt. — Problems surrounding Vermont State Colleges' (VSC) beleaguered computer system stem from a lack of adequate management, poor staff communications and a basic user naivete, a report presented last month to the college chancellor's office charged.

The eight-page report was prepared by Educom, Inc., an educationally oriented consulting firm, after a one-day visit to the VSC computer center here and an investigation into the system's troublesome history.

The report accused VSC's management of failing to work with both users and vendors in achieving a "cooperative solution to the problems" and blamed the Chancellor's Office for not taking a "more active" role in the situation.

VSC's Harris Corp. 120/4 computer, the subject of the report, was installed more than two years ago and services five state colleges, two high schools and a number of administrative areas.

However, since the system's inception, the computer has been plagued with numerous failures and malfunctions and much downtime — despite a $110,000 upgrade implemented last December [CW, March 27].

The Harris system, the report stated, has been understaffed both in "numbers and capabilities." The VSC installation was a "first" for the vendor in an educational environment that combined teaching and administrative chores, and the technology was not "geared to the level of technical capabilities available."

Software Vulnerable

The system's software is vulnerable to "naive usage," the report continued, and the computer's technical failures can be traced to "possible fluctuations in the [system's] power supply" and to problems resulting from a series of untested memory boards.

The difficulties immediately following the computer's 1977 upgrade were clearly the vendor's responsibility; however, later system failures were due to the irresponsibility of VSC's management and staff since "there seems to be little to criticize about the hardware support," the report pointed out.

But a number of people disagree with Educom's evaluation of VSC's computer system and staff. "The report was essentially a one-day evaluation of the center, and it was not intended to be any kind of an in-depth project," according to computer center director Gerald Smith.

Smith maintained the Educom report contains several inaccuracies, particularly concerning the number of people on the computer center's staff and the amount of time the system is utilized.

For instance, Smith noted, the report recommended increasing the operations staff and expanding the computer's workday by adding a second or third shift — even though at the time of the evaluation the system was being used 24 hours a day, six days a week.

"We already had a three-shift operation," Smith said, "and actually employed three full-time operators working five days a week and had work-study coverage on Saturdays."

Rick Miller, a programmer-operator working directly with the system, shared Smith's view of Educom's appraisal. "In the past couple of months, we've tried to work a couple of people in on the evenings and that seemed to improve the [system's] response time during the day.

"But there still is a lot of downtime because of computer problems, and I don't think the problem will be solved by any split shift.

"I really was rather disappointed with the report," Miller continued. "I doubt if the difficulties we've experienced over the last 30 months have been because of management or the users."

A five-college computer system that has existed for 2-1/2 years cannot be adequately evaluated in an "in-one-day, out-the-other" approach or captured in an eight-page report, Smith added.

"Someone told me if the [Educom] evaluation were to be turned in as a final report in a computer concepts course, the student would have failed."

College Chancellor Richard Bjork agreed that Educom didn't uncover any new or startling solutions to the VSC computer problem but, he contended, that wasn't what the board of trustees had in mind when they commissioned the consulting firm.

"We were interested only in having some comments with respect to a general level of operation," Bjork said, "not an in-depth analysis. One value of a consultant is that while he comes in and tells you some things you already know, his report carries more weight than if we said it ourselves."

The report recommended "more and improved personnel," a closer tie with the Chancellor's Office, a more centralized location for the computer system and a "fundamental shift in the approach taken to productivity."

The report's long-range solutions included another upgrade, which could cost the center up to $150,000, and the installation of a brand new system every few years. "Computer systems," the evaluation stated, "depreciate and must be replaced, much like the family car, about every five to seven years."

May Codasyl Meeting To Note Cobol's Birth

WASHINGTON, D.C. — The Conference on Data Systems Languages (Codasyl) has announced plans for its 20th anniversary meeting, which will be held here May 21-22.

In announcing the meeting, Codasyl chairman John F. Jones said Codasyl launched its effort to provide the DP user community with a high-level programming language exactly 20 years before the slated meeting date.

The fruit of the effort, Cobol, has become the most widely used business-oriented programming language in the world, he noted.

While Codasyl has not relaxed its effort to maintain and improve Cobol, Jones said, it has gone forward in other areas such as data base development, operating systems control languages and end-user facilities "in a continuing effort to serve the DP community."

The focus of the meeting will be Codasyl's impact on the user community it seeks to serve, Jones said. The meeting will provide opportunities to participate in panel discussions and presentations of Codasyl's past, present and future work.

The registration fee for the meeting, including luncheon on Monday, May 21, is $25. Further information is available from Nonnie Robertson, Honeywell, Inc., 7900 Westpark Drive, McLean, Va. 22102.

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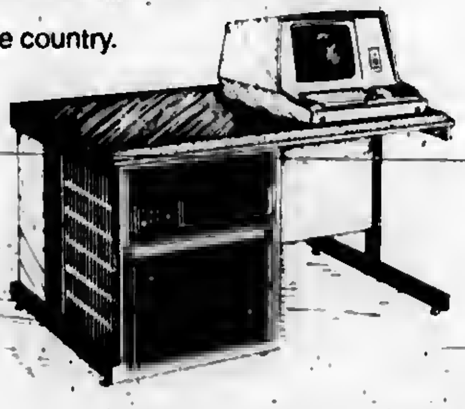

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Drive Toward Certification Seen Weak in DP Societies

By Brad Schultz
CW Staff

NEW ORLEANS — The drive to certify DP professionals has not won the overall support of most professional societies — not even the Data Processing Management Association (DPMA), where the movement essentially began — and certification is not generally seen as a requirement for DP jobs, a session of the 1978 DPMA conference here was told.

As administered by the Institute for the Certification of Computer Professionals (ICCP), DP certification requires an individual to pass a written examination of technical skills and to pledge compliance with a "code of ethics, conduct and good practice."

All candidates for the Certificate in Data Processing (CDP) "should have a professional attitude and a minimum of 60 months full-time, or equivalent part-time, work experience in a computer-based information system environment," an ICCP brochure states.

Most DP professionals will not certify themselves unless certification becomes a condition of commercial contracts, ICCP Vice-President Merton R. Walker told a "Symposium on Professionalism and Certification."

In the business sector, the need for a CDP must be created by top management, Walker said. Corporate chiefs would demand certification of their computing subordinates if contracts for DP goods and services specified certified-only work.

But relatively few advertisements for DP employees state a preference for certification, according to Beverly Madron, president of DPMA's CDP special interest group.

Although a certificate is generally seen as a "plus" for DP job applicants, the lack of a certificate is not usually seen as a "minus," Madron indicated.

Lack of Enthusiasm

The total memberships of major DP societies have shown a disappointing lack of enthusiasm for certification, the panelists agreed.

Jim Brown, director-at-large for the Association of Computer Programmers and Analysts, attributed this to confused and paranoid interpretations of certification's meaning. If the DP profession required certification in the fashion of the legal and medical professions, the popular image of DPers would improve, Brown said.

Alarmed by computer goofs and DP-based fraud and worried that computer technology threatens privacy and humanistic values, society currently views DPers as somewhat dangerous misfits, he contended. But the examination requirement would improve overall competency and reliability, while the ethical commitments imposed by certification would ensure a more socially responsible computing profession, he said.

Because only about half of the CDP holders contacted in a recent ICCP survey said they belong to a professional organization, the certification movement's influence on such organizations seems limited, Walker observed.

Since most of the conference sessions were well-attended, the many empty seats before the symposium panelists seemed to underscore their perception of little support for certification in DPMA and other professional societies.

Disease-Laden Mosquitoes Being Tracked by System

By Marcy Rosenberg
CW Staff

SOUTH BEND, Ind. — A computer system is playing a key role in research aimed at eventually controlling a species of mosquito that carries a strain of encephalitis.

The system executes search and data-crunching programs that supply researchers at Notre Dame University's Vector Biology Laboratory here with information to try to reduce the number of Aedes Triseriatus mosquitoes and break the transmission chain of La Crosse encephalitis.

"We recently doubled computer memory capacity and tripled our time-sharing operation time" by upgrading to an IBM 370/168 from a 370/158, according to Dr. Leonard Munstermann, postdoctoral fellow and one of the researchers.

For this application, an 8M-byte 370/168 uses two IBM Model 1403 line printers, 12 disk packs, one Tektronix Corp. Model 3006 and one Model 4012 graphic system.

"From a one-square-mile map of a given section of the country generated by the graphic systems, we can search for the various larval breeding sites — such as pools of water, lakes, marshes — of a specified mosquito species," Munstermann said. "The computer also helps us to determine the time of year the site was found" and therefore where the disease-carrying mosquitoes are most prevalent during the summer months.

Search Program

In addition, the IBM system stores over 40,000 research article references on the university's mosquito data bank, called Modabund. "This is a typical bibliographic search program using key words. The computer can pick out all articles that have specified key words in the title," Munstermann explained.

Search programs such as these are written in PL/1, he noted, while Fortran IV is used for data-cruncher programs in which the computer is asked to calculate, via a complex mathematical formula, the density of Aedes mosquito populations before certain experimental conditions are imposed.

In the future, the researchers plan to use a search program to track thousands of blood samples of birds in study areas to signal when encephalitis breaks out at these locations. They hope to prevent the disease from being transferred from the birds to humans by the Aedes mosquitoes.

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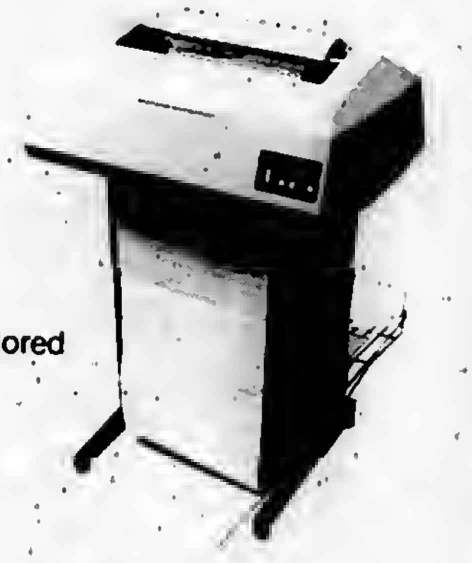

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System Adopted for Rating Bank DP Centers

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Federal regulators of financial institutions have developed a joint system for rating their member banks' DP facilities.

The joint system, announced here recently and already in effect, was adopted by the Office of the Comptroller of the Currency, the Federal Reserve Board, the Federal Deposit Insurance Corp. and the Federal Home Loan Bank Board.

The four agencies "will apply uniform standards to data centers that are operated by banks on thrift institutions [savings and loan associations] and to other data processing centers serving such banks or thrift institutions," according to the announcement.

The standardized rating system followed the adoption by the four agencies earlier this year of a "Joint Policy for the Examination of Data Processing Centers" operated by or serving financial institutions supervised by one of the four regulators.

The U.S. Comptroller office has responsibility for national banks; the Federal Reserve Board supervises state-chartered member banks; the Federal Deposit Insurance Corp. oversees state-chartered nonmember banks and insured mututal savings banks; and the Federal Home Loan Bank Board supervises federally chartered savings and loan associations.

Little Previous Cooperation

Although federal banking regulators have been examining their members' DP centers for several years, there has been little cooperation in the examination of DP centers that come under the jurisdiction of more than one regulatory agency, according to a member of the interagency task force.

Until now, an independent DP service company that served financial institutions regulated by several agencies would usually have to be audited by each agency, according to Basil J. Asaro, audit and DP examination coordinator of the Federal Reserve's Division of Bank Supervision and Regulation.

What is being done now that "wasn't done on a very sophisticated level before," he said, is that the four agencies are pooling resources to ease the burden of examination on independent DP service providers. Under the new policy, those companies can be examined jointly or by individual regulatory agencies on a rotating basis.

It was the decision to establish mutually acceptable audits of Independent DP service companies that prompted the development of the uniform rating system, he said..

Although individual bank examiners have always used rating schemes of some sort, he said, "if you're going to attempt to do something on an interagency basis, it's very difficult not to standardize."

The uniform rating system is "based upon an evaluation of four critical functions of a data processing operation: audit; management; systems development and programming; and computer operations," according to its official description.

However, Asaro pointed out that the joint policy does not prescribe what actions should be taken if a DP center receives a low rating.

The primary concern is for "safe and good operations of that data center" and, in the case of a low rating, to determine the effect of the inadequate DP services on the financial institution.

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Guide to Discuss Auditing Of DP-Based Accounting

NEW YORK — A guide entitled *Computer-Assisted Audit Techniques* will be issued at the end of January by the American Institute of Certified Public Accountants (Aicpa).

The guide describes the audit tools and techniques available to the accountant whose client uses DP for processing accounting data.

It also relates DP audit tools and techniques to audit objectives as well as describing an approach to planning and implementing such techniques.

Reportedly useful to those who currently have generalized audit software as well as those contemplating its acquisition, the section discusses the feasibility and planning of such packages. The discussion tells what factors should be considered in such a program and relates the necessary planning steps.

Also addressed in this major portion of the guide are the questions of application design, coding and testing, processing, wrap-up and work papers.

The second half of the guide covers other computer-assisted audit techniques including test data, program logic reviews and program comparison.

Appendixes to the guide discuss potential generalized audit software applications and generalized audit software application phases and tasks. Also discussed are errors and irregularities and some programmed controls that may prevent or detect them.

Although the final guide will not be available until the end of January, users acting quickly can get one of its half-dozen remaining 132-page draft forms, an Aicpa spokeswoman said.

The cost of the guide has not yet been determined. The draft copies and final copies can be obtained from the Computer Services Division, Aicpa, 1211 Ave. of the Americas, New York, N.Y. 10036..

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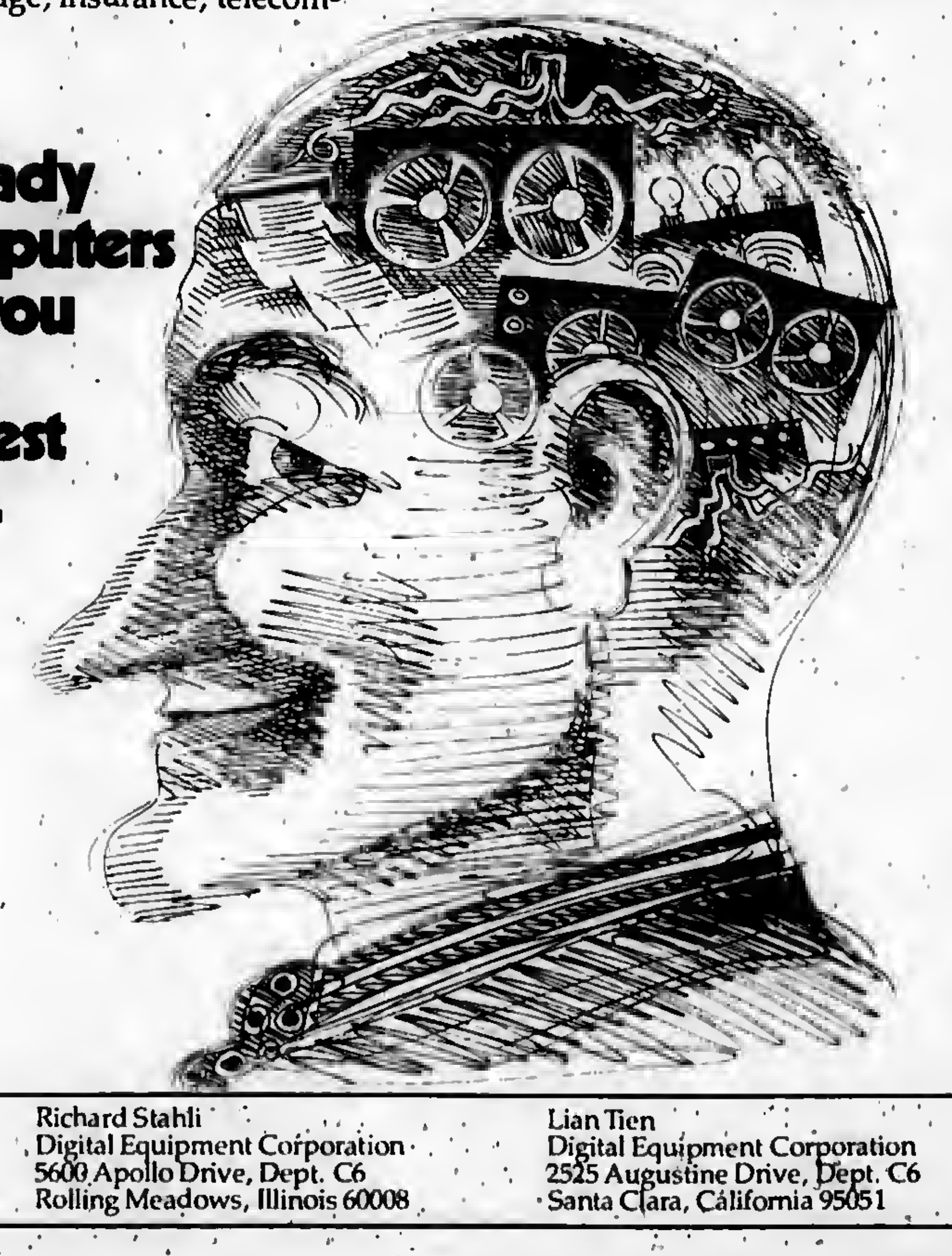

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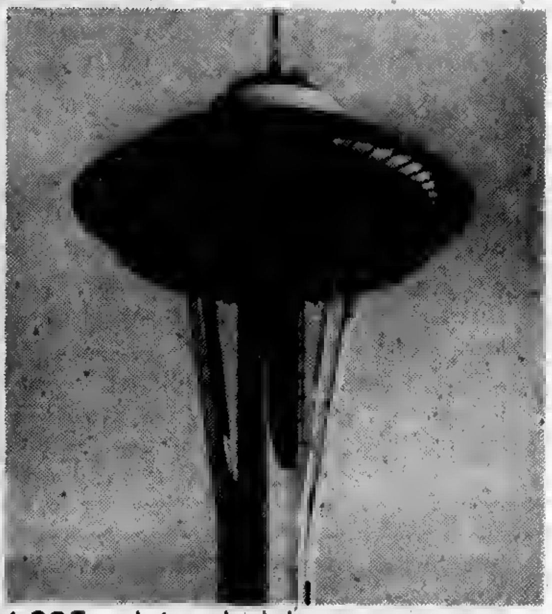
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Jovial Users Compromise

Special to CW

DAYTON, Ohio — Significant changes in the Jovial language were planned at the first-time-ever meeting of the Jovial J73 Users Group here last month.

Jovial, which is the Air Force's standard programming language, will become a blend of J73/I and J3B-2 as a result of a compromise between the languages' backers.

The resulting language, however, is unlikely to be upward-compatible with either J73/I or J3B-2, even via a translator, resulting in a major discontinuity in Air Force Jovial language efforts.

This discontinuity comes at a time when the Department of Defense (DOD) is moving toward a common triservices language [CW, Oct. 2]. The new Jovial implementation schedule — the language definition is to be completed by early 1979, with a first compiler available in mid- to late 1979 — has some overlap with DOD efforts. Considering that DOD's intent is the eventual elimination of service-specific languages, that overlap may result in a DOD-Air Force conflict.

The users group elected officers and planned its next meeting for Nov. 13-14 in Dayton, Ohio.

Officers of the group are Dr. Woodrow Vandever of Intermetrics, chairman; Dr. Maretta Holden of Boeing Aerospace, vice-chairman; and Dr. Judy Edwards of General Dynamics, secretary.

Calendar

Dec. 6-8, Houston — **Conference on Automatic Teller Machines,** sponsored by the Bank Administration Institute Contact: Bank Administration Institute, P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

Dec. 7-8, Philadelphia — **Minicomputers and Small Business Computers: Selection and Usage Guidelines**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 7-8, St. Louis, Mo. — **Datacon '78** (Systems/Data Processing Conference), sponsored by the St. Louis Chapters of the ASM and DPMA. Contact: Hardie Wilson, ASM/DPMA, P.O. Box 1401, St. Louis, Mo. 63188.

Dec. 11-13, Washington, D.C. — **Effective Computer Operations Management**, sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 11-13, Washington, D.C. — **Tough Positive Management — How to Make Employees Love It**, sponsored by the Institute for Professional Education. Contact: The Institute for Professional Education, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

Dec. 11-13, Washington, D.C. — **Computer Contract Negotiations Seminar**, sponsored by Brandon Consulting Group, Inc. Contact: Ruth K. Dargis, Brandon Consulting Group, Inc., 505 Park Ave., New York, N.Y. 10022.

Dec. 11-13, New York — **Integrated Data/Voice/Facsimile Communications Conference**, sponsored by *Data Communications*. Contact: *Data Communications*, 1221 Avenue of the Americas, New York, N.Y. 10020.

Dec. 11-14, Mesa, Ariz. — **Computer Elements Workshop on Putting a Maturing Technology to Work**, sponsored by the Institute of Electrical and Electronics Engineers (IEEE). Contact: S.M. Nelville, Room 2B438, Bell Labs, Naperville, Ill. 60540.

Dec. 11-14, Teaneck, N.J. — **Structured Design & Programming Workshop**, sponsored by QED Information Sciences, Inc. Contact: Edpep Coordinator, QED Information Sciences, Inc., 141 Linden St., Wellesley, Mass. 02181.

Dec. 12, Calgary, Alberta, Canada — **Seminar on Financial Systems**, sponsored by Software International Corp. Contact: Software International Corp., Elm Square, Andover, Mass. 01810.

Dec. 12-15, New Orleans — **Cause National Conference**, sponsored by College and University Systems Exchange (Cause). Contact: Cause National Office, 757 29th St., Boulder, Colo. 80303.

Dec. 13-15, Los Angeles — **Data Base Management Sytems; A Comparative Analysis,** sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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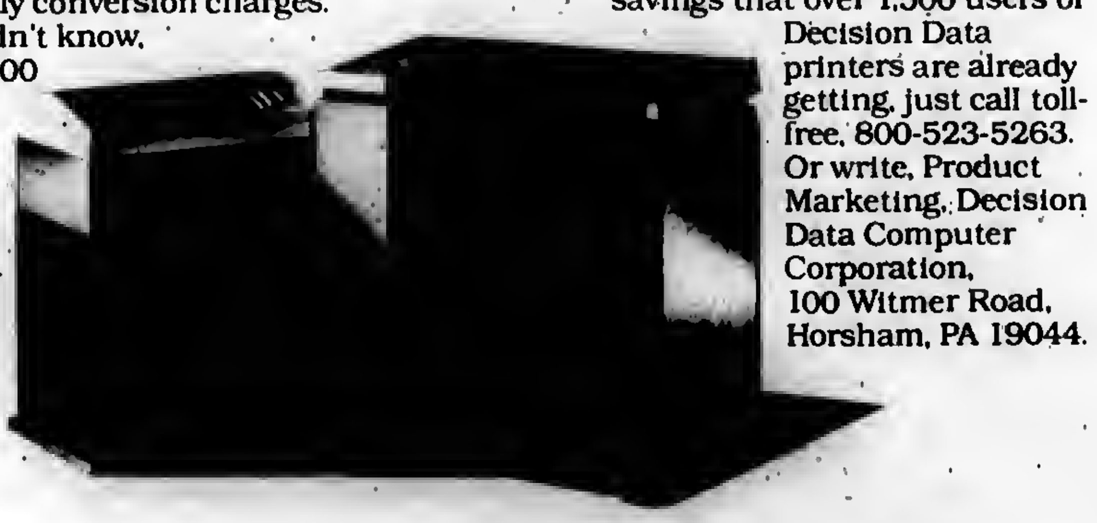

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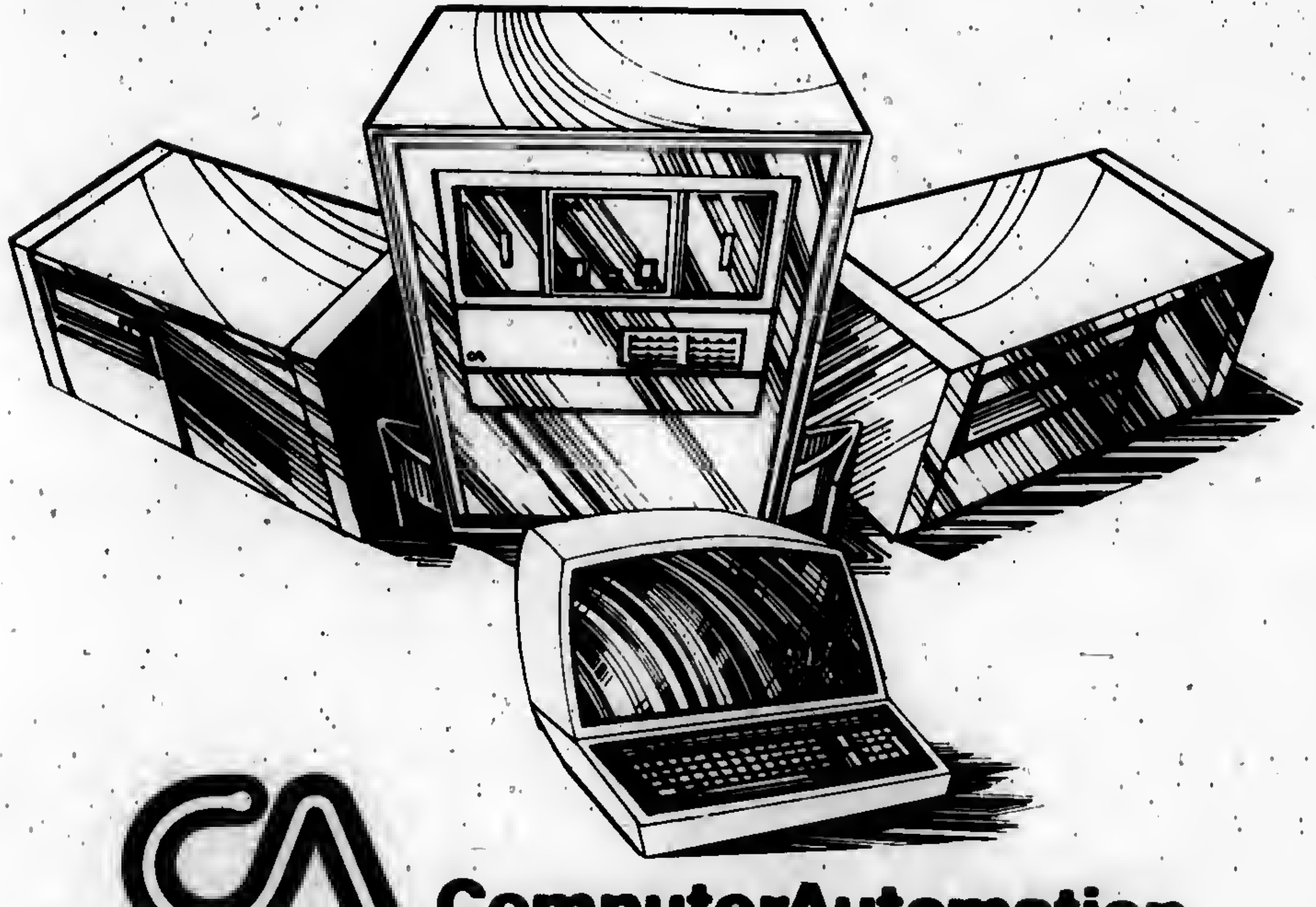

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Editorial

Back to Basics?

In an industry steeped in its own jargon and buzzwords, DP users have recently been hearing a new lament. Each day there seems to be another article on how to boil things down, how to sell in simple nontechnical terms, how to characterize products as solution-oriented and so on.

It is as if a magic wand of simplicity has suddenly swept away the fog of confusion among the DP multitude.

Minimakers are selling solutions instead of iron, software houses are selling results, instead of pakages and so it goes.

And at the same time, people who seem to be professional conference speakers are telling DP managers how to be real people with real ideas so they will move up to top management slots.

All this seems to imply that the rest of the world has finally figured out what it will take to straighten out those strange persons who have inhabited DP centers for so long.

Perhaps it is time to put this trend in perspective. For years, the DP staff lived with complex terms, model numbers, subroutines and operating system gobbledygook. DPers absorbed all the manifestations of technology that a budding industry could throw out, and they somehow adapted artificial verbal barriers into the meaningful output required by their using departments and management.

So now the newly hired, M.B.A.-equipped salesmen are replacing the engineering wizards of yesterday who could scope a CPU function and bring a voltage level high on command.

The approach of selling simplicity to the DP user is being hailed by marketing experts at suppliers and vendors as the greatest thing to hit this industry. These vendors are going to make DPers think in plain English, talk in understandable terms and produce lucid reports. The professionals' reward for this new functionality will be more respect by management, job promotions and a seat on the right hand of corporate power.

But somehow DPers are not impressed. They have had to wallow in jargon because these same vendors were first impressed with their own level of expertise. These same vendors spawned the most verhose lexicon during the days when complexity was the in thing.

DP users have spent a decade peeling away the artificial veneer vendors have chosen to apply to basic concepts. There is nothing revolutionary about these vendors now wanting to talk in real-life terms.

If this trend toward simplicity leads to a greater appreciation of the role of the DPer in the average business, it will be a welcome change. Meanwhile, those touting their newfound basic approach should not be so smug. They were the ones that lowered the fog.

Data Past

Five Years Ago
Nov. 14, 1973

MADISON, Wis. — Karleton Louis Armstrong was sentenced to 23 years in prison after pleading guilty to charges stemming from the Aug. 24, 1970 bombing of the University of Wisconsin Army Mathematics Research Center. A physics researcher was killed in the explosion and a Control Data Corp. 3600 system was destroyed.

— — —

LOS ANGELES — Three DP employees were indicted in the Equity Funding Corp. scandal, which charged 22 individuals with conspiracy to enter false information on the books of Equity Life Insurance Co., a subsidiary of Equity Funding Corp. The information was meant to deceive the Illinois insurance director who was in charge of regulating the state's life insurance companies. William Mercado, 32, former director of management information systems, and programmer Lester Keller, 32, were named with the 20 other defendants in the 105-count indictment.

Eight Years Ago
Nov. 18, 1970

NEW YORK — Univac introduced the multiprocessor 1110, designed for simultaneous batch, remote batch, demand and real-time data processing, either for comercial or scientific applications. The 1110's debut indicated an increased Univac awareness of the commercial DP user's needs with the addition of hyte handling and decimal arithmatic capability.

— — —

DETROIT — A "mystery hole" was cited as the main cause of a 56-hour delay in obtaining the final vote count in this city's primary election. According to some sources, the unexplained hole in the ballot card was caused by an improper fit of the card in the Votomatic machine.

Letters to the Editor

Briefly Stated

It would seem that the biggest advantage of the present five-digit Zip Code over Canadian or British codes is its ease in memorization (Canada has a six-character alphanumeric code and Britain's is even longer).

Rather than extend the Zip Code to an unwieldy nine digits, it would make more sense to prefix the Zip with the two-character state abbreviation. This would give 100,000 Zip Codes for each state.

. . . Or perhaps your government prefers long cumbersome numbers. Every citizen will soon have a 10-digit phone number, a nine-digit Social Security Number, a nine-digit Zip Code and so on. What's next? Nine-digit jockey short sizes?

Rob Green
Montreal, Canada

Banned in Boston?

I find myself in full agreement with the letter in the Oct. 30 issue written by the androgynous H. Andrew Shirley, who found the "obviously nude" model in the Sept. 18 Hewlett-Packard Co. ad "pornography and sexploitation abhorrent (sic)."

In fact, this representation is so titillating that it has replaced the office Playboy calendar and the young men fight over who takes the picture home for the evening.

I hope we see no more of these lewd portrayals or we shall see that Computer*world* and HP are banished from Boston.

H. Lee
Elk River, Minn.

Finally Turning a Profit

I was delighted to read in the Oct. 16 issue that Clapp & Poliak, sponsor of Info '78, is finally going to make a profit on the conference.

It is surprising Clapp & Pollak has not shown a profit in the past, considering the various fees it charges for admission and exhibition. Speaking for myself and others I know, it does not pay invited speaker's honoraria or expenses and has not informed us of this policy until after our statements were submitted.

If this is Clapp & Poliak's policy, one begins to wonder where all of its money has been going. One begins to wonder if it might not be compared to those types of businesses that solicit funds for charitable purposes only to have 90% of the donations retained for "solicitation" expenses.

Alan S. King
Arvada, Colo.

Plea From Car Owner

A simple computer system could save many cars from being stripped.

I received a computer letter dunning me for parking tickets issued after my car was reported stolen. The tickets had been written on a Friday, Saturday and Monday. Apparently the car was not stripped for several days.

Eventually, unlicensed immigrants were caught driving the wrong way on a one-way street — with one of my plates. The rest of my car was never recovered.

When the first parking violation was recorded, the plate number should have been checked against a list of stolen cars. A match would have alerted the police in time to retrieve the car.

Perhaps you fellow professionals in state motor vehicle departments might institute such measures.

Richard H. Shulman
New York, N.Y.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

The Human Connection

Matchmaker Finds DPers Overly Analytical

By Jack Stone
And Joan Hendrickson
Special to CW

A fresh perspective on how data processors appear to the outside world can provide new insights to help us relate more effectively to people both inside and outside the business. And I'm certainly not the first one to say that we need all the help we can get in this regard.

Recently, I returned to visit Joan Hendrickson, a modern-day matchmaker whom I have been following as she begins to apply computing and video technology to help single professional men and women find their true loves. During our conversations, I learned that DPers constitute a substantial percentage of her business!

Because the match-making process requires the development of keen sensibilities about people, I asked Hendrickson, an up-and-coming writer in her own right, if she would generalize her perceptions of the personalities, attitudes and social attributes of her DP clientele. Here was her response:

More than any other class of professional people we deal with — and we have, for example, a large number of doctors and attorneys in the service — DP people fit into a particular category. True, they have individual personalities, but still they are more easily classifiable.

They appear to have these kinds of attributes: they seem to be rather rigid; they often take on passive characteristics when dealing in special social situations; and they are frequently overly analytical where social conditions really do not merit it.

For example, let's take the case where a newcomer to our service is given an application form. The usual person takes the application and completes it promptly and without question. But not our DPers! They take a long time to study the meaning of each question in excruciating detail, to the point where their answers are so mechanical that they fail to appeal to the emotional interests of the opposite sex.

The question "What are you truly looking for in a relationship?" really throws them. They reflect long and hard, whereas most people respond quickly. From this and similar experiences, I conclude that most computer people lack the wonderful spontaneity that makes life exciting.

It's usually difficult to interview them for our service because they like to know exactly what will be asked. When we start off, the conversation is usually flat in that although they reveal a lot about their lives and their profession, their responses are dull. I don't like to say this, but sometimes their personalities seem to be dead.

We spend perhaps 30 minutes with the typical client in a "warm-up" session to relax the person so that his personality will be properly presented. When the time is right, we turn on our video cassette system whose camera is focused on the client. The audio captures the complete two-way interview.

But it takes our typical DP client much longer to warm up than most other clients. I believe the reason is that DPers are the least trustful of all of our clients, and until they begin to trust us, they are reluctant to talk about things that are really very important to them.

They have great difficulties discussing their true feelings about, well, just about everything. So, for many of these clients, we have not been satisfied with how their personalities came across on the tape.

But for other DPers, some trigger during the interview opens them up. And when this happens, they express such creativity and excitement! Although it's a rare event, when they do come through, they become — alive! It's great!

Maybe I can put it together for you in this way. These people, basically, have real sensitivity, super intelligence and so much to offer to others. They are actually a caring kind of people, but they simply don't know how to express it. They don't demand of us — they are the best kind of client in this regard — but they are so, so distant.

Sometimes I wonder how these people, who have such difficulty relating to others, are so successful in the business world — or are they?

Next week, Hendrickson, who is a copresident of the Georgetown Connection in Washington, D.C., writes about her perceptions of DPers in another challenging social environment.

Reader Commentary

Central Control Lacking In U.S. Military's DP

By James W. Clinton
And James Mescall
Special to CW

Computerworld has recently reported on charges that the military services pay inadequate attention to DP resource requirements [CW, Aug. 28], lack responsiveness in crises [CW, Aug. 7] and have failed to acquire state-of-the-art hardware [CW, Sept. 18]. The latter concern was evident from a description of major air defense data communications facilities, consisting of 17-year-old equipment which is not even discussed in the Air Force's computer training curriculum.

These articles reflected an awareness by the military services that their equipment was outdated and an admission by the Army that it did not have a sufficient number of officers trained to utilize its computer hardware capability.

Military budget requests consistently ask for top-line combat equipment so as to keep up with our adversaries' capabilities. The use of much of this equipment is inseparably joined to the computer hardware and communications equipment which monitor global military movements of men, material and equipment.

Combat equipment, communications facilities and the data transmitted and processed by those facilities represent a single system. If one element is deficient, the entire system's adequacy is only as good as that which is least adequate — a somewhat tired, but true, principle.

Consequently, why is it that our defense establishment is only slightly concerned that its computer facilities are second-rate when the President has spoken of desiring a national military establishment which is second to none?

Major defects are alleged to exist in those celebrated areas of management — organizing, planning, controlling and directing — dealt with on familiar terms by most business undergraduate students.

The Department of Defense (DOD) spends billions of dollars every year on computers, computer support facilities, related manpower operations, training and on contractor assistance for the installation, operation and evaluation of computer systems. Apparently believing that these valuable assets can best be managed under a centralized organization, DOD recently reorganized its DP resources [CW, Aug. 28], placing increased control under the Office of the Secretary of Defense.

This centralization of control appears to be warranted to ensure that these costly resources are applied in a unified manner to achieve an alert defense posture. The deficiencies identified

(Continued on Page 30)

The Taylor Report

Bank Notices Disturb CW Readers in October

By Alan Taylor
Special to CW

Banks seem to have caused problems for my readers this past October. On Monday, Oct. 2, the computer at the Maryland National Bank found Mike, a local DP director, guilty of the heinous sin of being almost $7 past due on a Master Charge debt. In addition, he owed a current payment of $10, amounting to a grand total of $16.95.

So, out went the word — an "Act today!" type of order.

In a notice dated Oct. 2, Master Charge said: "Our records indicate that the past due condition of your account has not been corrected. Please forward the past due amount today."

So much for Monday. On Tuesday, the computer discovered that in the intervening time, Mike *hadn't* come forward with the $7.

Now, the fact that the post office needs time to deliver mail does not impede a computer from carrying out its alloted tasks, so the call went out again.

The notice dated Oct. 3 read: "Our records indicate that the past due condition of your account has not been corrected. Please forward the past due amount today."

And so it continued. Wednesday brought the same message; the updated issue date was the only change that broke the monotony.

The computer kept telling Mike to get his money in "today," and it really meant that today. It seemed to expect Mike to perform magic, sending in the payment before the notice even reached him. Why else send him the same notice for three successive days?

In Mike's letter to me, he explained that he rarly uses Master Charge because it uses "one of the most offensive billing systems" he'd ever seen. He wanted to know if the three consecutive notices constitute harassment and if he could collect damages.

Well, Mike, I'm with you. But instead of answering your question here, I'd like to hear the opinions of other professionals in DP, in auditing and even in the field of law.

Does this constitute harassment or is it something else? (After all, harassment does have a number of legal definitions.) Can Mike collect damages in Maryland?

Could he do so in another state? Would other facts need to be present before the bank could be held liable? I'd like to hear your answers to these questions.

Meanwhile, In Virginia

Meanwhile, well into the month of October and 100 miles away, the computer at the First Virginia Bank in Falls Church was trying to cope with a $788 check deposit that had a five-day collection hold on it.

(Continued on Page 30)

Central Coordination Needed in Defense DP

(Continued from Page 29)

in previous CW articles may be moderated by this reorganization.

The reorganization, however, will not solve the noted DP inadequacies if sufficient attention is not given to the planning associated with the development and use of manpower, mainframe and software resources.

The military services are especially noted for their vast planning apparatus and its successful application to many combat and contingency situations, but this same expertise seems flawed in its application to DP management.

Once again, the services are not isolated preventive or retaliatory forces. They are joined to one another to form a common defense force. The lack of uniformity in their states of DP readiness is evidence of a lack of centralized management and control and a divided opinion concerning the association between DP resources and the separate services' missions and responsibilities.

The alleged shortfalls in DP manpower capable of handling DP operations is surprising. The services do an excellent job of training pilots to fly advanced aircraft, training support personnel to service these aircraft, procuring the aircraft and related support equipment and continuously upgrading defense facilities.

What is the problem with DP? Is it a mysterious art that is inflexibly tied to a limited number of individuals with a certain set of aptitudes, or is it a skill that can be learned by individuals possessing a broad set of general aptitudes?

DOD spends millions of dollars each year to educate its officer candidates through Reserve Officers Training Corps programs and the service academies and to train its officers at private universities and commercial and service-owned technical training installations. However, significant errors in planning appear to have been made if all this effort, manpower and money has not satisfactorily addressed DP manpower requirements.

Clinton is assistant professor of management at the University of Wisconsin-Whitewater and a former systems analyst with the DOD in areas related to command and control.

Mescoll is an independent consultant and lecturer in management computer systems with the university's Department of Management.

Bank Notices Disturbing

(Continued from Page 29)

The depositor wrote out some checks that reduced the balance to $775.26 — a serious overdraft, nearly twice the $7 amount that so distressed the Maryland bank.

In this case, the system had the following message for Boh, another DPer:

"Checks received today have been paid resulting in an overdraft of $775.26 in your checking balance. To cover this overdraft, we have advanced $100 to your checking account, which now has a balance of $875.26 and added $100 to your loan balance which is now $100."

Bob, needless to say, was somewhat disturbed by the message. He saw that it was mathematically absurd; adding $100 to an overdraft position of $775.26 would not result in a balance of $875.26.

Bob traces the problem to the analyst confusing "uncollected funds" with "overdraft condition."

The notice itself is the main concern here. And I give the First Virginia Bank message writer the *highest commendation for* the best notice *I have* seen.

The most important function of a notice like this is to be intelligible when wrong. Messages should have this self-diagnostic capability.

Programs do go wrong, and when the notice makes it clear on the surface what has happened, then, it is simple to track down the cause and correct the situation. The notice from the First Virginia Bank does this very well.

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EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer — the Burroughs B1700 — with card input sequential files and no video displays, we suffered long delays and storage constraints.

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds — all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested — all by only two people — and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software.

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

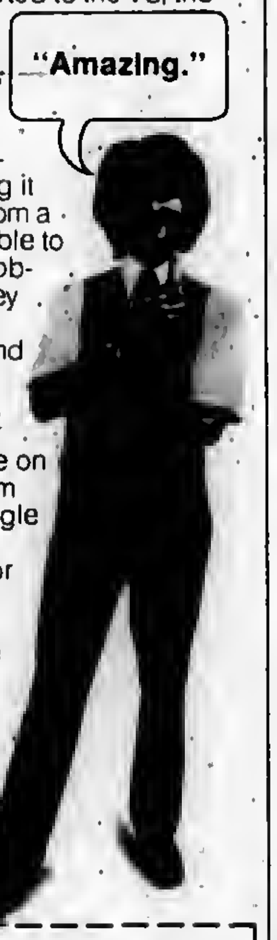
J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it: Thanks to the programming power of the VS, I actually came up with more.

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."



EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason.

The VS is a remarkably sophisticated, fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment.

The VS provides for distributed data processing, thus avoiding costly consumption of mainframe resources. It's fast, responsive, ease to use and can support up to 2.3 billion bytes of on-line storage. What's more the VS speaks EDP people's language: COBOL, BASIC, RPG II and ASSEMBLER.

We also think you'll appreciate how simple the VS is to operate. In fact, because of its level of sophistication, it can be operated by people with little or no computer-related training or experience.

One more thing: the entry level price of the VS is under $50,000. Which is perhaps the most remarkable thing of all about this computer.

For more information on the VS, return this coupon to Wang Laboratories, Lowell, MA 01851.

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Aghast at Corporate Immorality

'Mag Tape' Blows Whistle on Her Employer

By Miles Benson
Special to CW

Sociology of Computing

It isn't often in the software world that you stumble onto a shocker.

What I mean is, coding is pretty much a workaday, nose-to-the-listing kind of grindstone job. Policemen discover bodies; lawyers find evidence; journalists unearth scandals; but programmers are lucky if they stumble onto a misplaced ELSE in a nested IF statement.

Which makes Mag Teaple's find all the more shocking.

It all began innocently enough. Not just innocently, uninterestingly! Because Mag was assigned to the writing of her organization's year-end research report by a vindictive manager who caught her sneaking in late one morning.

Perhaps it's time to back out a few layers of our story. First of all, the scene is Sophistication, Ark., home of the Ecology Strip Mine and Energy Co. Mag Teaple — known to her peers as "Mag Tape" — works for the Computing Sciences department of Ecology.

Now Ecology does a lot of energy-related scientific applications, many of them simulations of the creation and/or use of energy from unusual sources to determine cost-effectiveness.

For instance, a lot of interest was created last year by its study on "The Use of Bonded Scotch Whiskey and Other Alcohols in the Transportation System of the 21st Century."

A Profile of Mag

Well, Mag is a part of all that, a key part. She is acknowledged by her colleagues as one of the sharpest of the Ecology programmers. (Management, because of her laissez-faire attitude toward working hours, dress codes and other company policies, is not quite as enthusiastic).

Mag coded and sped into production some of Ecology's best simulations. "Burning Coal in Vertical Takeoff Aircraft" and "Windmills as an Element of an Intercontinental Power Network" emerged directly from printout pages resulting from her programs.

In short, Mag Tape was a holdover from the days of the programmer-iconoclast; she more than earned her salary, and she more than claimed her own compensating benefits.

In retrospect, it was obviously a mistake to assign Mag to the year-end research report. Management must have known it was sitting on a bomb.

Handing Mag a match and pointing out the fuse to her was rather unwise. Still, that's what management did, right or wrong, smart or dumb.

Now writing a year-end research report is a kind of programmer's Siberia. Especially if you didn't do the research.

You tell all the great things you set out to do at the beginning of the year, all the great things you did along the way and all the great things that resulted at the end of the year.

Not pure pompous puffery, because the research review community is too sophisticated for that, but cleverly subdued pompous puffery. It's the kind of stuff an ad man could write left-handed behind his back, if he understood the content of the research.

And it's the kind of stuff a programmer with a reasonably objective frame of reference hates to write. Tell-it-like-you-wish-it-was vs. tell-it-like-it-is. That's the Siberia to which management banished Mag.

But, as you may have already guessed, there was a skeleton in Ecology's research closet. To understand how the skeleton got there, we have to back out a few layers again and look at the Ecology big picture.

Every year, Ecology gets a bundle of research money dropped down its chimney by a red-suited man from the federal Department of Energy. In exchange for that bundle, Ecology pledges to be good and to perform a set of creative and innovative investigations into some frontier technology areas.

For the year in question, for example, Ecology's plans included re-

(Continued on Page 32)

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Reader Commentary

Error Detection Method Much Too Complex

By Fred J. Burke
Special to CW

The method described in "Locating Transposition Errors" [CW, Oct. 9] yields a helpful result but the method is unnecessarily complex. There is no need for scientific notation or probability theory.

First, there is no need for calculation to find the columns involved. In the article's example, the difference of $7.20 occurs in the second and third columns from the right. These are the columns involved.

In an example such as that in the article, where the difference between the two columns involved is 72, there can be only two possible transpositions of figures in adjacent columns that could have caused the difference. These are 08 instead of 80 and 19 instead of 91. Rather than looking for two digit numbers with a difference of eight between the values of their first and second digits, it was necessary only to look for the specific numbers 08 and 19.

In addition, the average probability of each number being a "candidate" for the source of the transposition is not relevant, since there is a precise number of probabilities, depending on the amount of the difference.

For a difference of 81, the largest possible resulting from a transposition of figures in two adjacent columns, there is only one possibility,—09 being used for 90. Seventy-two can result only from 08 or 19 (instead of 80 or 91).

Sixty-three can result only from transposing 07, 18 or 29; 54 from 06, 17, 28 or 39; 45 from 05, 16, 27, 38, or 49; 36 from 04, 15, 26, 37, 48, or 59; 27 from 03, 14, 25, 36, 47, 58, or 69; 18 from 02, 13, 24, 35, 46, 57, 68 or 79; or 09 from 01, 12, 23, 34, 45, 56, 67, 78 or 89.

Type this in the form of a table on the back of a card, and you will avoid unnecessary mathematical manipulation.

Burke is a professional engineer working in Chicago.

Whistle Blown on Crime

(Continued from Page 31)

search involving a software simulation of various techniques for extracting oil from shale rock and other formerly uneconomic oil sources.

Well, we need to deal with still another factor in the Ecology big picture. The president of Ecology, Ebenezer Smith, is an Entrepreneur of the old school. If making a little money is good, making a lot of money is the ultimate good, according to Ebenezer.

Ebenezer's pet project is a solar power package. He envisions great whirling fans rotating through space, picking up the sun's rays at close range.

But experiments with solar power require giant transfusions of money. And Ebenezer — the plot now congeals — scooped up all the available Ecology money he could find to support his potentially profitable hobby. Including some money that wasn't really available.

Including, specifically, the shale software simulation money.

That money was scooped up early in the year. And no serious shale software simulation work has been done. At all.

Now, reenter Mag Tape. Her job, remember, is to write the year-end research report, including a description of the shale simulation that doesn't exist.

Mag's jaw dropped a measurable amount when she, in pursuit of data for her report, found out the facts about the expenditure of the Department of Energy money.

Slowly, carefully, with a glee that never before accompanied the production of a year-end report, Mag did a systems analysis job on the Ecology fund transfer system. She documented the decision points, named the decision makers, described the entire process.

The logic and completeness of her report was impeccable. Even for Mag, it was a superb job. She described the anatomy of corporate immoraltiy as it had never been described before.

Then, late one evening, after the rest of the Ecology crew had gone home, she dropped a copy of the report on her manager's desk.

On the top of the report, she inscribed the note, "Chuck — Here's the year-end research report. I think you'll find it comprehensive and accurate. P.S. I sent along a copy to the Department of Energy and to the United Press. You'll understand why when you read it. — Mag."

On the way home that night, Mag Teaple dropped a couple of 8- by 10-in. envelopes in the corner mailbox. Those who saw her do it might have noticed a smile of satisfaction — perhaps even of moral righteousness — on her lips.

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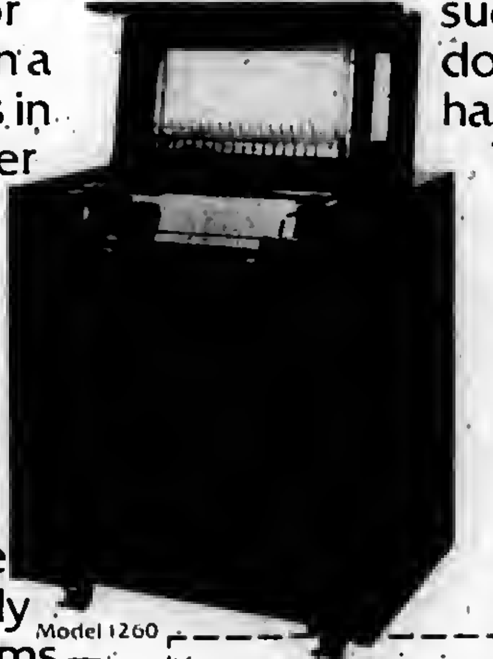

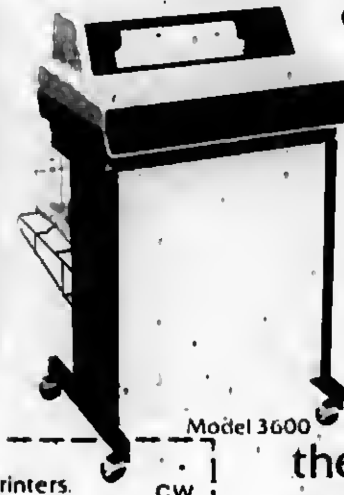

Letters to the Editor

Letter to President On Zip Code Plan

The following letter was sent to President Carter.

Dear Mr. President,

The U.S. Post Office is planning to change all Zip Codes from five characters to nine characters. The impact is greater than the Post Office realizes. I would very strongly urge you to prevent this action. The expense and confusion of converting would be incredible.

By profession, I am a computer programmer. Perhaps the greatest pandemonium of all would be the necessity for all computer users to change all programs and data files which use Zip Codes — possibly 75% to 90% of all business programs in existence. This proposition would be extremely expensive. Furthermore, changes would need to be implemented correctly and all at once if business is not to be arrested. This proposition would be nearly impossible.

Realizing that the Post Office does have legitimate reasons to require more information in the Zip Code, may I suggest an alternative to increasing Zip Code length. We can change Zip Code nomenclature from five numeric characters to five alphanumeric characters. Whereas only 100,000 combinations are possible using 10 numeric characters, 60,466,176 combinations are possible using 36 alphanumeric characters (10 numeric plus 26 alphabetic). More code combinations are possible by increasing the set of valid characters (N to the fifth power).

The resulting change would not be cheap, but the costs would be infinitesimal in comparison to changing the length of the Zip Code. In most cases, there would be no programming changes and no data file changes for industry to contend with. The only changes would be address corrections, which would be required in either event.

Alan N. Lawrence
West Bend, Wis.

'Exactly' Meets Needs

Bernard Boar really hit home in describing the nightmare of "Abend Debugging and the Cobol Programmer" [CW, Oct. 2]. However, he overlooked one software package that exactly meets the needs he described. Readers ought to be made aware of Capex Corp.'s Optimizer III, which has been sold to 330 sites in the last seven months.

Optimizer III has a detector feature that provides Abend information which relates directly to the Cobol source. It eliminates the need for hex arithmetic and debugging at the machine-language level.

It supports both test and production environments, and it reduces paper and print time for Abend reports by 50% to 70%.

Barbara J. Walter
Product Manager
Capex Corp.
Phoenix, Ariz.

Overlooked Technique

In the In Depth review of Cobol debugging techniques [CW, Oct. 2], Bernard Boar accidentally overlooked a powerful debugging technique which is currently available and is in use by more than 150 large computer centers. This technique involves the use of Abend-Aid, a software product from Tomark, Inc.

Abend-Aid doesn't exactly fit into any of the categories mentioned in the In Depth. It especially doesn't fit into the "vendor software monitor" category which Boar suggested is "inappropriate to dangerous."

Rather, Abend-Aid is an extension of the operating system that is automatically invoked just before the dump is produced. At that time it will analyze the contents of storage and print out the cause of the problem in English.

Depending on the cause, some supporting data may be provided such as Cobol working-storage or current records. If Abend-Aid can pinpoint the reason, then the dump is suppressed. If not, then it is allowed to continue. Abend-Aid typically solves 85% to 90% of the system and IMS user abends in the average shop.

Howard W. Newkirk
Vice-President
Tomark, Inc.
Southfield, Mich.

Basic Standardization

Jeff Raskin's remarks on Basic standards [CW, Sept. 25] caught my attention. He was concerned about the X3J2 (Basic) Committee's procedure.

Anyone interested in Basic standardization is welcome to communicate directly with the committee through its chairman, Dr. Thomas E. Kurtz, Department of Mathematics, Dartmouth College, Hanover, N.H. 03755.

Guy K. Haas
Concord, Calif.

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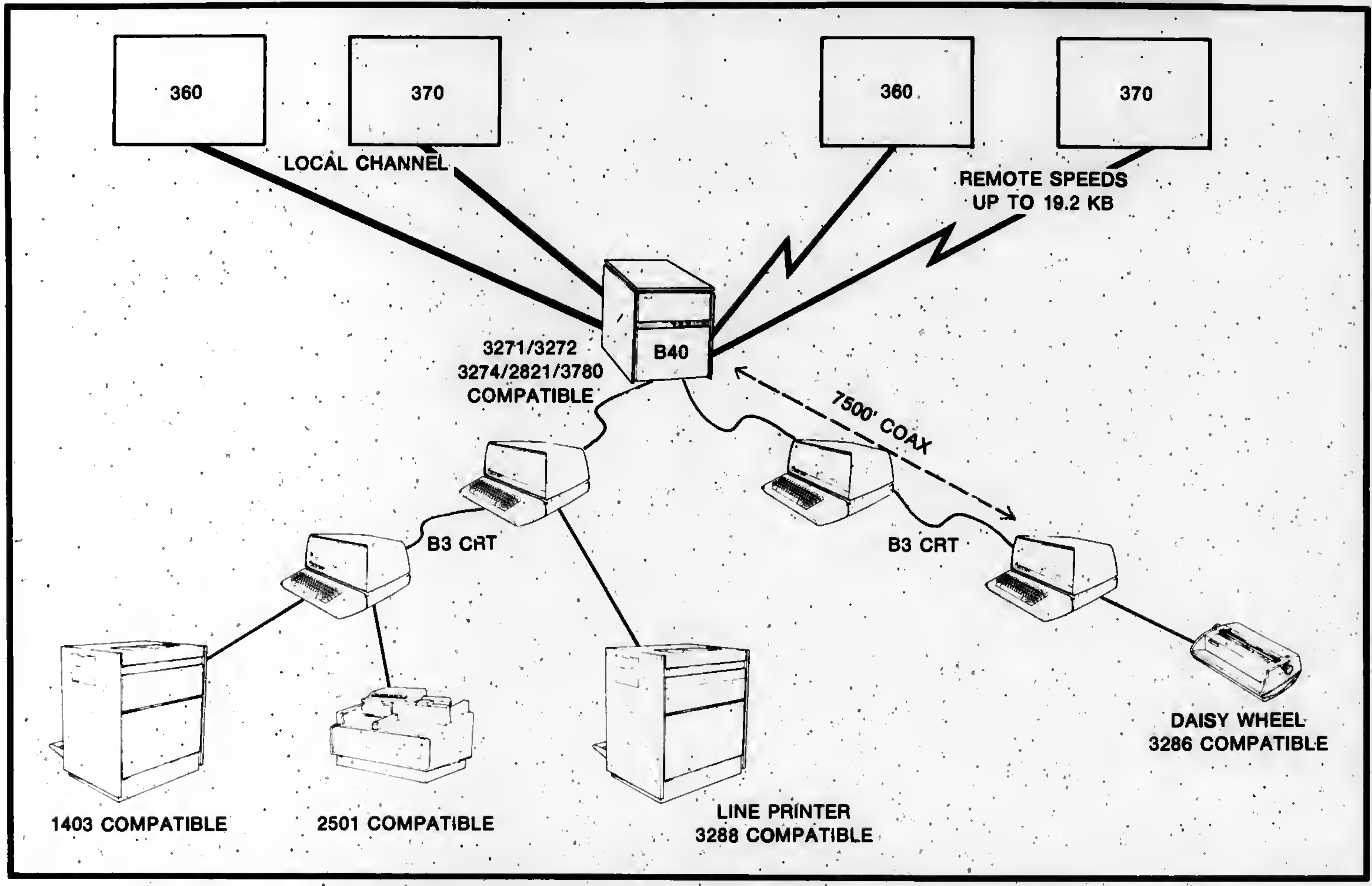
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ICP Considers On-Line Support

INDIANAPOLIS — International Computer Programs, Inc. (ICP), publisher of the semiannual ICP Software Directories, is currently experimenting with an on-line search system designed to allow people to browse through a data base of software information.

The interactive ICP Quicksearch compares user requirements against currently available products cataloged in the data base. Then it generates a "readable, usable, highly structured" report "within minutes," according to an ICP spokesman.

ICP Quicksearch allows users to scan through the information about packages and vendors without being limited by the classifications set up in the softcover books, the spokesman noted.

Essentially, the user is free to phrase a query in any way that seems useful. A prototype version of ICP Quicksearch was demonstrated at Info '78 in Chicago and at the Federal Computer Conference last week in Washington, D.C.

Users of the system — which will probably be installed on one or more remote computing service networks, if initial public response is favorable — will have complete, controlled access to information concerning every product on the market that would fit their needs, the company asserted.

Specific information provided by ICP Quicksearch includes product name and descriptive narrative, price and terms, operating environment, language, hardware requirements and vendor contract data.

Search criteria can be modified, broadened or narrowed as a search continues, the spokesman explained.

ICP has not yet completed arrangements with any remote computing vendors. Therefore, the spokesman could not say how, or how much, users will pay for the service or when it will be available.

ICP is at 9000 Keystone Crossing, Indianapolis, Ind. 46240.

System Design Is Program Key: Kapur

By A. Robert Nemeth
Special to CW

DUNDEE, Ill. — "The secret to productivity is not to make programmers work faster writing more code, but to help them work more intelligently by insisting they learn the theories of systems design," Gopal Kapur told some 100 DP managers at the Fifth Annual International Dearborn Computer Co. User Conference here recently.

"Our reliance on systems of all kinds as solutions has put the burden of business productivity on the programmer," the California consultant said. "But while everyone talks of coding and defines productivity as the number of lines of debugged code written per day per programmer, programmers become competent program builders and certainly not the systems designers who are so badly needed."

Programmers should be taught how to build systems just as engineers are taught to design and build bridges. Instead of trying to get students coding within the first day of class, educators and DP managers should teach instead the facets of system design, just as civil engineers are taught strength of materials, weather stress conditions and theories of weight distribution before they build their bridges, according to the consultant.

Standardized Logic Units

As a leading proponent of universal or standardized logic units, Kapur indicated that this concept of system design or preplanning means a programmer learns to work with pseudo code, actually "walking it through" before he commits it to a coding form or sits down at a terminal.

"On-line programming is an interesting phenomenon from a system design standpoint," Kapur told the Dearborn group. "Often the start of on-line programming in a shop actually means lower productivity. It is such a totally new method that it takes time for people to adjust to working with keyboards and without coding forms or data entry clerks.

"Then as time goes on, if the on-line system is developed properly and programmers don't actually develop code while they type, productivity goes very high. On the other hand, if programmers do not plan before they sit down at the terminal, productivity reaches an all-time low. Lots of coding may be done on-line, but without planning or system design behind them, the effectiveness of programmers' work plummets," he said.

Referencing the book *Systemantics* by John Gall, M.D., Kapur pointed out that the advice in the last century to the young and ambitious was "Go West, young man." In this century, he said, it appears to be "You've got to have a system."

Today the system is the solution.

"But we must control our systems through proper planning or the systems will control us," Kapur said. "There are several systems theorems that need to be counteracted. For example, new systems mean new problems.

"In fact, once it is established that elements work together, the system itself gains a certain life

(Continued on Page 42)

CMG Sets Annual Conference Plans

SAN FRANCISCO — "Management and Evaluation of Computer Performance" is the theme of this year's annual conference of the Computer Measurement Group (CMG) now scheduled for 3-1/2 days starting Dec. 5 at the Fairmont Hotel here.

As with similar meetings in the past, CMG IX will include a mix of tutorial sessions, technical briefings, panel discussions and mandatory "birds of a feather" get-togethers to focus on problems not covered by the agenda.

Plenary sessions will give attendees the opportunity to hear outside speakers and the CMG board of directors the chance to present awards for the three best technical papers. In addition, the A.A. Michelson Award will be given for significant contributions to computer performance evaluation (CPE), according to conference general chairman Robert Bishop of Ernst & Ernst, Atlanta.

One of the technical sessions the first morning will include a discussion entitled "Computer Capacity Planning: Evolution and Management," by James C. Meehan of New England Telephone Co. That afternoon, Paul J. Jalics of Cleveland State University will try to help listeners gain an "Awareness of the Performance of Cobol Programs."

Later in the week, Thomas Bell of The Singer Co. will conduct a tutorial on computer performance management (CPM) and Laurent de Vilmorin of Laboratoire de Metrologic Informatique, Paris, will run a panel highlighting CPE/CPM in the new DP environment.

Although there will be no selling allowed, vendors of appropriate products will be represented in a variety of ways, according to Bishop. The products run the gamut of hardware monitors, software monitors, simulation programs, software performance analyzers and disk space management packages, he said.

The conference is open to all with a registration fee of $135 for CMG members, $155 for others. More information is available from Richard L. Arnold, Crown Zellerbach, One Bush St., San Francisco, Calif. 94119.

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Harris Enhances Fortran

FORT LAUDERDALE, Fla. — Structured programming statements, rotate and shift logical operators and double-buffered and overlapped I/O are some of the extensions Harris Corp.'s Computer Systems Division has included in its multipass Fortran package.

Fortran 77 is compatible with Ansi 66 specifications and is incorporated in Harris' series 100, 200 and 500 computers, functioning under the Vulcan virtual memory (VM) operating system, Harris said.

The software reportedly exceeds 1977 Ansi Fortran standards and features in-line assembly codes, compatibility with 1966 standards for Hollerith data types and octal constants and octal format conversion. The package also has a reentrancy capability that allows users to share the same copy of the language processor and to concurrently execute the same copy of an application program, a spokesman said.

In addition, Fortran 77 has a debugging ability, aided by optional symbolic debugging tables that are nonresident and do not affect the size of the user's program, according to the spokesman.

Information concerning the software package, which will be available in bundled versions in January, is being offered from the firm at 1200 Gateway Drive, Fort Lauderdale, Fla. 33309.

Improved Response Time Highlight of IDMS 5.0 . . .

WELLESLEY, Mass. — Release 5.0 of the IDMS data base management system (DBMS) from Cullinane Corp. is said to have a streamlined runtime for increased efficiency in the on-line environment. Reentrancy, record journaling and concurrent update protection have all been improved, a spokesman said.

Field test sites report terminal response times have been reduced as much as 80% for some transactions and elapsed time for job execution has been chopped 50% at some installations, he claimed.

Release 5.0 has restructured the Central Version software — which enables multiple concurrent users to work with a single copy of the DBMS — so that the data base administrator can tailor the system to meet specific environmental requirements.

The update has reduced the size of the application program-DBMS interface by 90% and made it, the module servicing multithread operations and the subschema tables reentrant, the spokesman said.

Journaling of data base updates at the record level, provided in Release 5.0, reduces journal file output and allows disk journaling which permits "warm starts" and automatic recovery, he continued.

The new release also allows the user to specify record or area "locks" to prevent concurrent update of the same record or area by two or more programs. In addition, record locks permit one program to protect selected records from access or update by another program, he said.

In addition to changes in the DBMS itself, the release also provides several new utilities. One backs disk journal files to tape and compresses the records when they are on disk. Another eliminates logically deleted records, while a third expands page sizes for specified data base files, he continued. Release 5.0 is available for $45,000, the spokesman concluded from 20 William St., Wellesley, Mass. 02181.

. . . Allows Use In CMS Setting

WELLESLEY, Mass. — Cullinane Corp. has a special version of its IDMS data base management system (DBMS) available for users operating with the Conversational Monitor System under IBM's Virtual Machine Facility/370 (VM/CMS).

A spokesman said he believes this is the first commercially available DBMS to run in that environment.

IDMS-CMS is said to provide a full multithreading capability with complete backup and recovery, ensuring full integrity of the data base.

Also available in the CMS version of IDMS are features carried over from other versions, including host language support for Cobol, PL/I and Fortran; disk logging; and a fully integrated data dictionary facility.

It was possible to develop the CMS version because of the new architecture incorporated in Release 5.0 of IDMS, he added. IDMS-CMS costs $10,000 in addition to the cost of the IDMS central version, he concluded from 20 William St., Wellesley, Mass. 02181.

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Periodic Review Needed

Data Base Recovery Seen as Art, Not Science

By Richard M. McConnell
Special to CW

Writing on the topic of data base recovery is like wrestling with Jello. It's easy to acquire, but very difficult to manage.

The basic problem is that recoveries are dependent on the situation. This makes it hard to say anything that is generally or even frequently true.

Despite this obstacle, recent experience has provided insight into some of the mysteries of recovery which may be of some help to those who must cope with, and even conquer, information management systems (IMS) data base recovery problems.

Recovery, an Art

First of all, I believe recovery is an art, not a science, at this stage of IMS data base technology. I say this because a recent attempt to write a recovery procedure at an IMS shop proved impossible.

The purpose of writing the procedure was to provide DP operations with all documentation and information necessary to run an IMS data base claims processing system in production mode.

To the operations staff, this meant that for auditing and control purposes, application support programmer/-analysts should not be allowed in the computer room or have uncontrolled access to live runs of check writing jobs. The operator instruction "call programmer" was — justifiably — anathema to operations' concept of production.

I stress that the attempt proved impossible and that recovery is an art because, despite vast amounts of consideration and consultation, there was no escaping the necessity of the "call programmer" instruction for data base problems.

Actually, the routine was usually: call programmer, call data base administrator, call IBM suport representative and then call IMS systems programmer.

This discussion is not intended to either justify or renounce data bases, IMS or traditional DP auditing concepts. Smooth operations, however, require new working relationships between these aspects of DP.

In terms of the recovery procedure, three phases were categorized:

- Problem identification.
- Recovery procedures.
- Restart procedures.

Problem identification was broken into four component groups:

- Hardware.
- Software (system and/or IMS).
- Application (programs or data base).
- Operations.

Problems could be caused by trouble in any one group or compounded by multiple causes. This is similar to, but usually more complex than, typical DP problems.

Once a problem becomes apparent, and its probable cause is identified, recovery procedures require the judgment and discretion of the data base administrator working in concert with representatives from applications, systems, operations, vendor and management. Each recovery is in essence — regardless of simplicity or complexity — creatively designed, applied and should be *tested* to ensure restoration of data base integrity.

I think the situation is analogous to that of the damage control function aboard ships. You never know what's going to happen, maybe nothing, but you must act quickly and accurately under immense pressure to keep the whole effort afloat when something *does* happen.

Restart Procedures

Once recovery is made and data bases are restored to integrity, then restart procedures can be initiated to resume processing.

Restart procedures are amenable to traditional concepts of the system/-operation functional split. Appropriate procedures can be established for the construction, submission, and operation of utilities, jobs and Job Control Language (JCL).

There may well be a science to restart procedures, but not to recovery, because recovery requires diagnosis, whereas restart can be based on skill of execution.

Wrong Model

DP fundamentals need to be reviewed and revamped in light of the new complexion data bases give to basic concepts.

In particular, in sequential file updating, the time-honored strategy has been to process new transactions against the old master to create the new master (See Figure 1). To recover a data base according to this model can lead to misunderstandings, even if one knows all the corrective steps to take for a recovery.

Characteristics of master files and update program logic that make sense in the sequential file update scenario can be distorted or rendered inapplicable in a data base update scenario.

Figure 2 shows what the factors are in data base in-place updating. The most significant change is that the *data*

(Continued on Page 40)

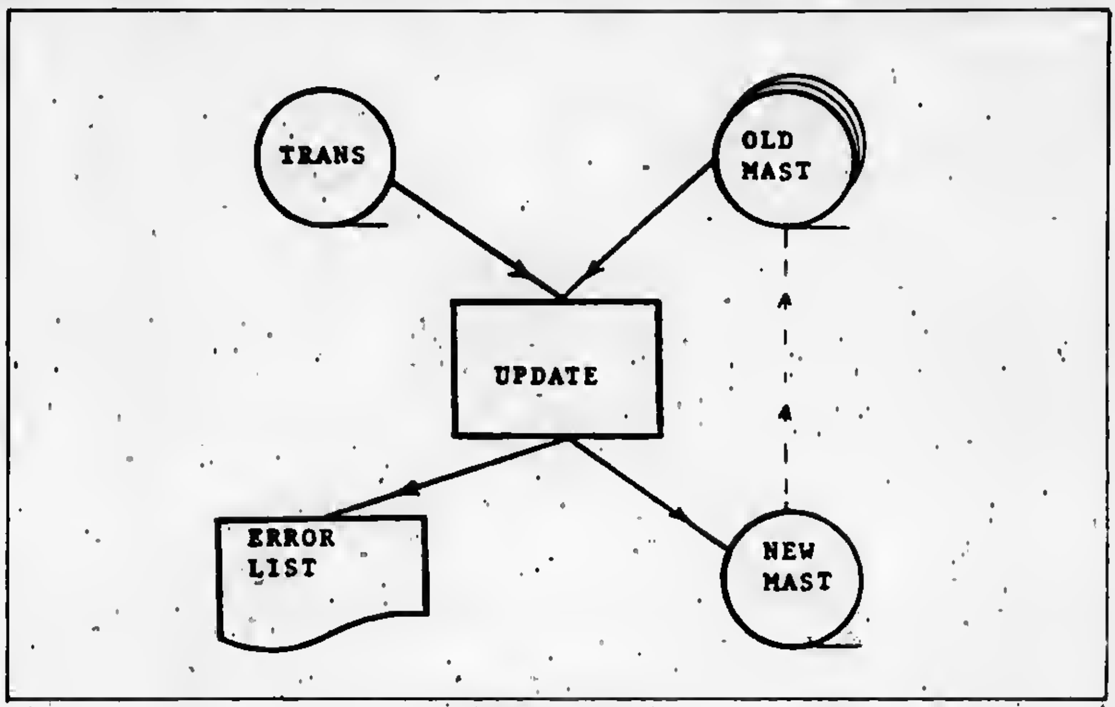

Figure 1

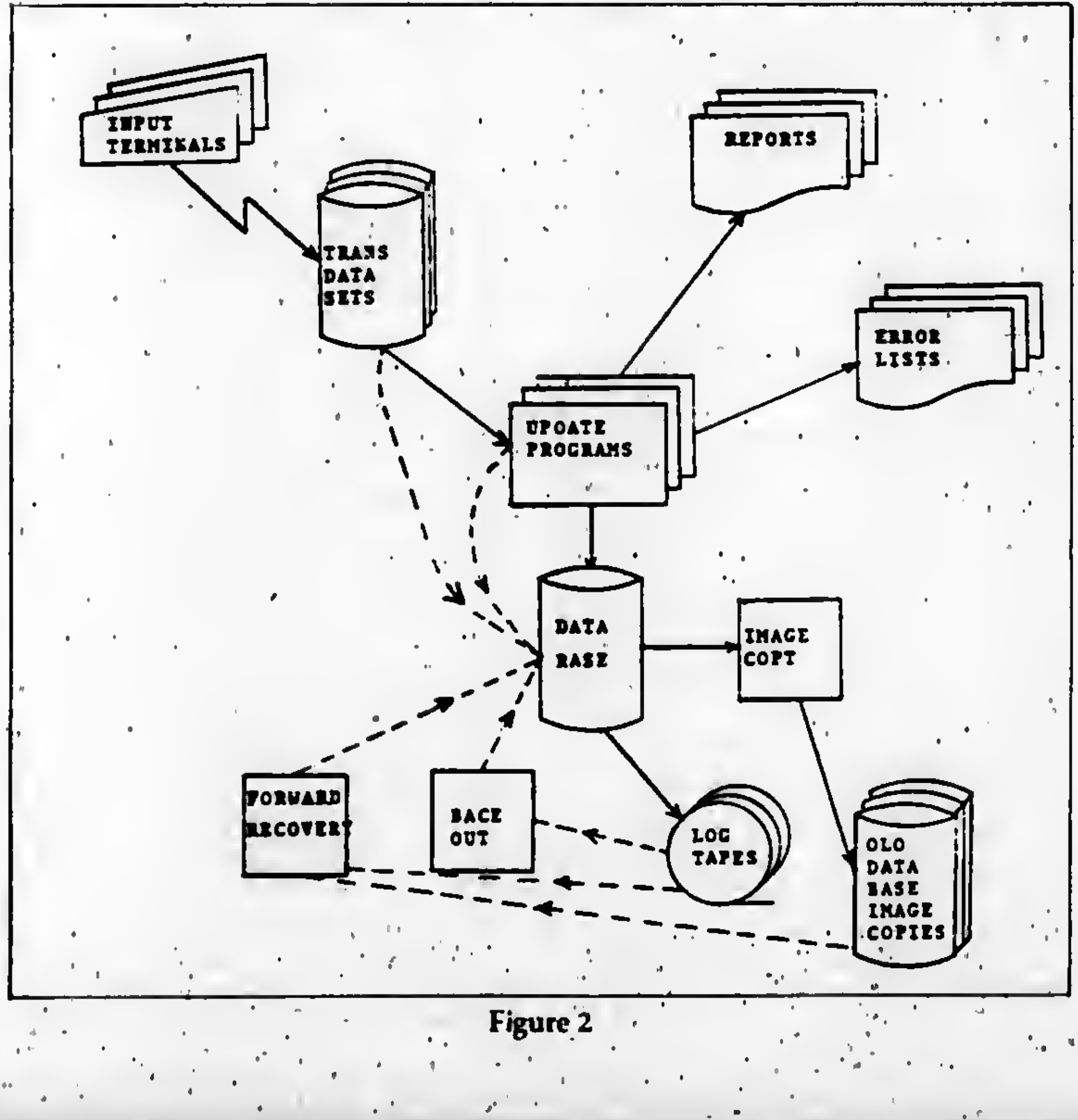

Figure 2

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Zaneski Wrong: Operators, Programmers Need Separate, Different Documentation

Concepts and Techniques

By Julia Van Duyn
Special to CW

While it's axiomatic that program documentation needs to be well-organized, current and detailed, it is preposterous to state that programmers and machine room operators require identical documentation. The fact is that — contrary to Richard Zaneski's article ["Documentation Requires Detail," CW, Oct. 9] — operators have neither the time nor the inclination to read detail program documentation, except in really small shops where the programmer doubles as computer operator.

Zaneski mixed apples and oranges to effect a so-called program documentation guide that does not satisfy the requirements of either programmers or operators. What the operators need and want is a runbook for each application (or system or subsystem) such as accounts receivable, accounts payable, pricing subsystem and company pension system.

Each runbook needs to contain, first of all, a general system narrative. It might say, for example, "Accounts receivable, a subsystem of accounting systems, is produced from the daily billing runs. Costs and miscellaneous charges, as well as drop shipment charges and credits, are produced at the branches and input to the daily A/R transaction register by remote job entry."

Next, because computer operators run jobs (each job may contain one or more programs) and not programs, the documentation of each job must have a job stream flowchart that shows clearly labeled input files and cards (if any), processing programs and output files and reports that the programs generate, as well as the disposition of these outputs. This page also states the job name (for example, ACR0005), Proc name (AR1010TP), frequency (twice daily), approximate running time (15 minutes) and program name (A/R Summary).

The following page displays a copy of the Proc/JCL deck listing.

The next page details special instructions ("Hold A/R daily transaction cards for Proc AR1020DY"), as well as restart procedures — for example, "The job may blow up because of sequence or data exception errors. When this happens go back to the input cards and sight check data field, cc 70-74. This will catch any blank cards, or sort for zone punches in cc 1 to pull any stat cards left in with the summaries. Stat cards have an 'S' in cc 1. As soon as either a stat or a blank card is found, rerun the job."

Error Messages Defined

The following page displays error messages. It would explain, for instance, that the console message ENTER DATE-MMDDYY means "use two digits for month, day and year for the day A/R is being run."

The next page is for printer and carriage tape specifications — form name, form number, form lineup, carriage tape and distribution of reports.

The final page presents the library tape specs — DSname/file name, library or tape name and the retention period ("after this tape is sent to all branches in RJE, it is placed in the library and retained for seven days").

All of the above sections are repeated for as many jobs as are contained in one application or subsystem, and each page of each job displays the Job name and the Proc name.

Paperwork for Programmers

While the operators need the type of documentation described above, the program paperwork for programmers must include:

1. *An input data description* that describes the source, volume, procedures and controls exercised regarding the source documents.

2. *An input field description* that describes the input field, input source and Cobol picture (alpha, numeric or alphanumeric).

3. *Input editing criteria* describing the messages received, the transactions (add, delete, change) and the computer action to ensure that the input is edited properly.

4. *A logical flowchart and narrative* of the programs within the application.

5. *A file description* that narrates briefly each file's purpose and content, its organization and sequence. Specifically:

- File security — security classifications.
- Access method — sequential, indexed, random, hierarchical, etc.
- Sequence — the method by which the file is accessed.
- File device — disk, tape, etc.
- Timing — the frequency of the file running (daily, weekly, monthly, quarterly).
- Records in the file — how many, their size and the blocking factor.
- Transactions — the volume and type of transactions.
- Update interval — how often the file is updated.
- Control and update procedures — the controls exercised and the procedures by which the update is performed.
- Backup — in case reconstruction of file is necessary.

6. *A data element definition* that documents each data element's name, number, Cobol picture, synonyms, originating subsystem/application, definition ("A code used to indicate action to be taken when the account number edit shows an error condition") and the value and description of the value.

7. *Output files and reports descriptions.*

Van Duyn is a documentation specialist and author of several articles and at least one book on the subject.

Courses Teach MVS, IMS

OVERLAND PARK, Ks. — Edutronics/McGraw-Hill has announced the availability of "MVS Utilities," a multimedia course consisting of eight audiovisual modules and accompanying textual support materials.

The student is graphically shown how the System, Independent, Data Set and Sort/Merge utilities operate. The course also presents a detailed look at the Job Control Language used with the utilities and provides practice coding exercises.

At the same time, Edutronics also announced the availability of a course on "Advanced IMS Programming," which the spokesman said is the fourth in a series for programmers, data base administrators, systems analysts and DP managers.

The courses are available under various rental plans from the company at 55 Corporate Woods, 9300 W. 110th St., Overland Park, Ks. 66210.

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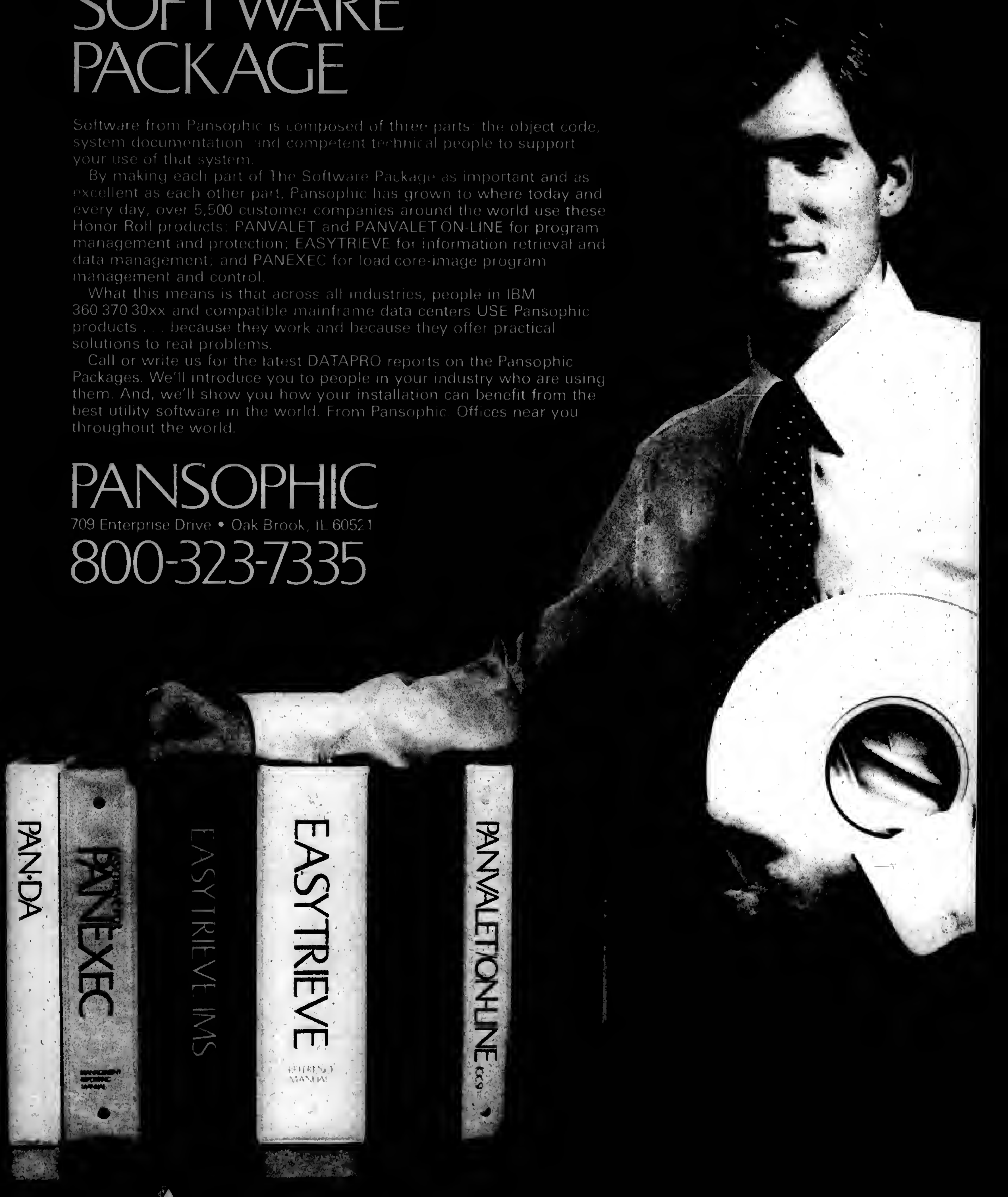

Nine Partitions Supported

DOS/RS Version 7 Puts Users 'Halfway to OS'

PARK RIDGE, Ill. — Version 7 of the DOS/RS operating system from Dearborn Computer Co., Inc. includes a half dozen enhancements that combine to take users "halfway to [IBM's] OS," according to a spokesman.

The update includes, for example, support for as many as nine batch partitions in addition to the spooler.

The newly available Resident Access Method makes heavily used IOCS Logic modules "considerably smaller" and allows them to be core-resident in a special system area. Main storage and core-image library space savings are "dramatic," he claimed.

DASD space management support offers improved disk handling and control by assuming the functions of locating and managing unused disk space, allocating user files and releasing space, he continued.

As part of the Power III spooler built into DOS/RS, a scheduler runs jobs based on priorities, core availability and device availability. In addition, a new option in the jobstream provides listings of all operator communications, including console messages and JCL, on all executed jobs; this speeds recovery on interrupted jobs, the spokesman said.

Another option, called DOC/RS, makes the IBM 1052 terminal work as if it were a 3270, he added.

DOS/RS ranges in cost from $5,500 to $19,750, depending on the number of partitions supported.

The DOC/RS and DASD space management options cost $2,600 and $3,000 respectively, the spokesman said from 1460 Renaissance Drive, Park Ridge, Ill. 60088.

Data Base Recovery Called An Art Form, Not Science

(Continued from Page 37)

base is central and critical to the processing, not the programs.

Multiple programs may have been run after the point of lost integrity and may require rerunning. Log tapes are always required.

To recover, back out will generally first be attempted. If this is unsuccessful, forward recovery is necessary and image copies are required.

Coordination of correct versions and sequencing of transaction data sets, programs, log tapes, old data base image copies and utilities is absolutely necessary to restore integrity.

This coordination can be the most frustrating part of recovery, particularly if further problems occur during the recovery attempt.

When multiple data bases need recovery, the severity of the situation is increased. But good systems design should minimize, if not totally eliminate, the extent to which one data base's lost integrity can infect other data bases.

The distinction between what is involved in sequential updating, as shown in Figure 1, and in-place updating, as shown in Figure 2, may be obvious once observed. It was getting to the observation point that required hard work and frustration.

What we need to keep in mind for the future is to be ready to reexamine some of our other, as of yet still buried assumptions, when frustrations pile up faster than solutions.

SCS Publishes Books

LA JOLLA, Calif. — The Society for Computer Simulation (SCS) has published *Toward Real-Time Simulation*, Parts I and II.

Edited by Dr. Roy E. Crosbie and Dr. John L. Jay of the University of Salford, England, these hardcover books contain papers originally presented in the UK in May 1975.

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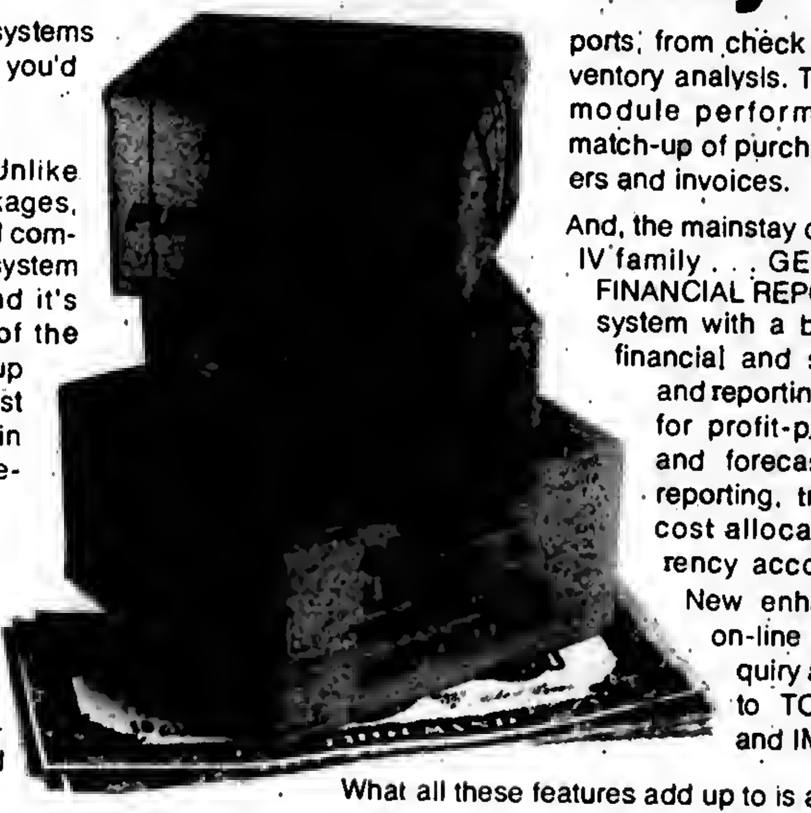

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'Super-Sort,' 'Word-Master' Run Under CP/M

ROHNERT PARK, Calif.— Described by the vendor as a high-performance, IBM-type sort/merge/-extract utility, Super-Sort is now available from Micropro International Corp. for use under CP/M and derivative operating systems on microcomputers, according to a spokesman.

Available separately, the Word-Master package provides "extensive" facilities for text editing based on "dumb" — and therefore inexpensive — CRT terminals, he added.

Super-Sort runs on floppy disk-based systems and supports as many as 32 keys with intermixed sequence indicators, data types and collating sequences, the spokesman said, adding that binary, BCD packed decimal, Ascii, Ebcdic and numeric string data, among other types, can be handled.

The package can work with variable or fixed-length records including variable or fixed-length data fields and supports user-defined optimization parameters as well as SELECT and EXCLUDE commands to control the records to be sorted or merged in any given run.

Super-Sort can be invoked from the user's host language and exits within the package also allow users to invoke own-coded routines for processing partial results or selected records in the middle of the sort/merge run.

Meanwhile, the Word-Master package, in video edit mode, reportedly features control key commands that allow bidirectional word tab, line tab and screen tab, left/right word delete and line delete and character or line insert/-delete, including midline insertion facilities.

With a command mode as well, Word-Master facilities are particularly suited to high-speed typing and editing applications — especially where some previously prepared text is to be used, such as in proposals and other legal documents, the spokesman said.

Super-Sort costs $250, while Word-Master is available for $150, Micropro said from 5810 Commerce Blvd., Rohnert Park, Calif. 95903.

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Base in Theory Seen Vital For Effective Programmers

(Continued from Page 35)

direction of its own, with the actual outcome often left up to the system instead of those who should be controlling it," he added.

"A system built to automate a particular task will become a problem when it breaks down, gets behind schedule, goes over budget or becomes overallocated. But if this system has been properly designed instead of merely pieced together, these problems will be anticipated and solved during the initial state of system implementation," he maintained.

Regulating Growth

"Systems are like babies. Once you get one, you have it forever. They don't go away. They display the most remarkable persistence and, in fact, tend to grow. They encroach. But if the best concepts of design have been used, this growth is regulated and channeled properly; much of the chaos connected with a growing system is avoided," he said.

Kapur noted that complex systems exhibit unexpected behavior. "One of the best examples is the Awan dam in Egypt, which was built at enormous expense to improve the lot of the Egyptian peasant. It has caused the Nile to deposit its fertilizing sediment in Lake Nasser, where it is unavailable to the farmers."

Egyptian fields must now be artificially fertilized, and gigantic fertilizer plants have been built to meet the new need, he pointed out. The plants require enormous amounts of electricity and suddenly the dam must operate at capacity merely to supply the increased need for electricity which was created by the building of the dam itself.

"A true designer could have foreseen this turn of events and reworked the plan. Instead, the complex system took a turn of events which left everyone surprised and scrambling," he said.

Systems Controlling Programmers

"People in systems do not do what the systems say they are doing. For example, programmers are hired to develop programs, write new code. But according to many major studies, programmers spend the majority of their time correcting errors they themselves make and in fighting the system that is supposed to be on their side. Suddenly the system has developed goals of its own and is controlling the programmers," Kapur said.

How do we cope with this systems game? Referencing Gall, Kapur said the great secret of system design is to be able to sense what things can be done easily by means of a system and what things are hard to do — and to avoid the hard things. "Otherwise," Kapur cautioned, "the system begins to grow and encroach, to break down in ways you never thought possible, get in the way and oppose its own proper functions.

"You become anxious and push on it to make it work. Suddenly, any productivity is better than none and eventually you come to believe that the misbegotten product the system so grudgingly delivers is what you really wanted all the time.

"At that point," he said, "it's too late for planning or wise use of system design. You have become absorbed; you are now a system person until the next time a system and the chance to design it properly come along."

Nemeth is regional manager for Dearborn Computer Co.

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'Jomo' Updated

GREAT NECK, N.Y. — Jomo, the job mix optimizing system developed by Labyrinth Systems, Ltd., has been updated to improve its internal performance. The system was originally designed to get 20% more work out of multiprogramming systems, but the enhancements make it even more efficient, a spokesman claimed.

The software, on request, can provide a histogram highlighting CPU usage by job mix. Jomo also tells the scheduler or operator which jobs should be run together for maximum usage, he added.

The optimizer is customized to a user's site, he said.

Jomo imposes an overhead cost of 20 minutes a day, he asserted, adding that the package is available for $5,500 from 17 Barstow Road, Great Neck, N.Y. 10022.

'Roscoe' and 'ETC' Linked

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has linked the word processing facilities of the Extended Text Compositor (ETC) package with those of the Roscoe on-line programming system.

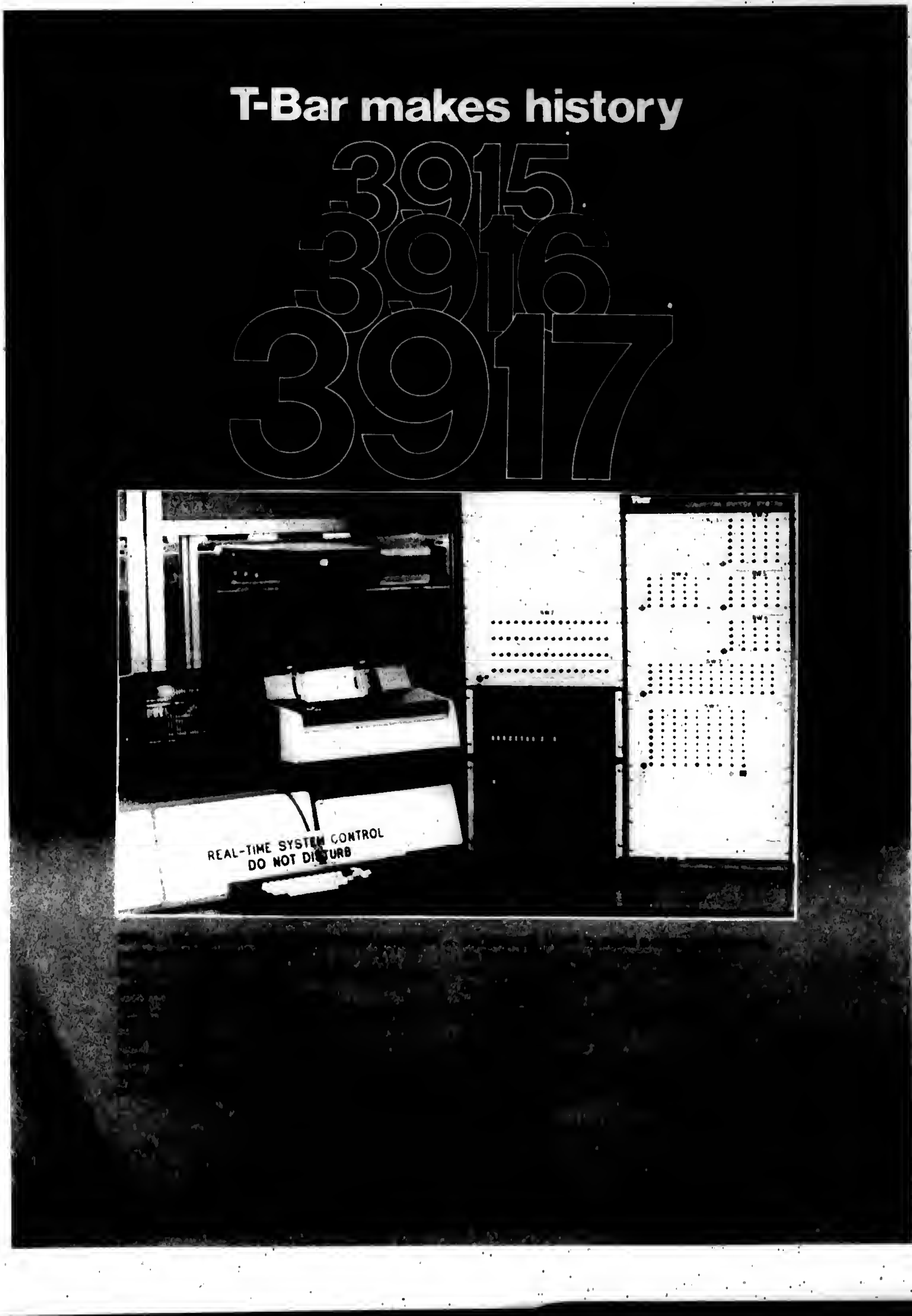
ETC is said to be well-suited to common business jobs such as producing form letters, stock lists, memoranda, mailing labels and internal telephone lists as well as for program documentation.

Although the full-scale ETC operates under IBM's Cics, the ETC interface to Roscoe uses that package's teleprocessing monitor. On the other hand, the interface provides the Roscoe user with a basic word processing facility in which all text is updated and maintained with Roscoe's full-screen editor, the spokesman said.

If they wish, users of the Roscoe/ETC interface may have access, in background mode, to the full ETC system.

The permanent license fee of ETC with the interface is $5,900; it is also available for $300/mo on rental, or $190/mo or $157/mo for three-and five-year leases respectively.

Roscoe itself costs about $30,000, the spokesman said from ADR's headquarters at Route 206 Center, Princeton, N.J. 08540.



Insci System On CSC Net

EL SEGUNDO, Calif. — Current reporting requirements for Equal Employment Opportunity (EEO), the Occupational Safety and Health Act (Osha) and the Employee Retirement Income Security Act (Erisa) are all part of a personnel time-sharing service introduced by Computer Sciences Corp. (CSC).

The Insci Human Resource System is a series of modular computer programs that allows users to determine relevant labor pools; compute necessary labor statistics, percentages and parity indexes; and present a company's utilization analysis in approved formats, a spokesman stated. The service also compares a company's figures with current labor market statistics.

Timetables Simulated

The system can also simulate timetables to fill jobs based on assumptions of the available labor market, company growth rates, internal promotions and job vacancies, the spokesman continued. In addition, personnel managers can model Affirmative Action programs with the system.

Other modules automatically produce Erisa compliance reports, actuarial data, employee benefits statements and reports of insurance premium payments as well as calculate accident rates, print injury logs and maintain other various Osha data.

The personnel service is available on CSC's Infonet network and its cost is based on regular time-sharing rates, the spokesman said from 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

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Packages Support Civil Engineers

ENGLEWOOD CLIFFS, N.J. — Resource Software International, Inc. (RSI) has added 19 civil engineering packages to its inventory of minicomputer-oriented packages.

Swinging around in a totally different direction, the company has also announced availability of a financial analysis package for evaluating options, a spokeswoman added.

The civil engineering packages are said to facilitate the solutions to such problems as road alignment, turnout design and boundary and area determinations. Written in Fortran for General Automation hardware, each of the stand-alone packages costs $230, she noted.

Financial Analysis

The financial analysis package, called Beta Computation for Options, is said to be capable of instantaneously computing various parameters relating to the variability of options on a security.

Different variabilities for a rising market and a falling one are computed by the package. Further, "since the option holder usually is interested in the fair market value of the option," this package finds such an objective measure, the spokeswoman added.

This package is a necessity if the option trader is to work rationally, she asserted, noting that options are "enormously" volatile by ordinary standards. Typically, a three-month option on a conservative stock having a variability index equal to the New York Stock Exchange Index will vary at 20 times the rate of the stock itself."

Written in Basic, this software has been demonstrated on SOL hardware. The package costs $180.

RSI is at 140 Sylan Ave., Englewood Cliffs, N.J. 07632.

Info 3 Reduces Cost of Courses

WOODLAND HILLS, Calif. — The cost of three audio-cassette DP training courses offered by Info 3 have been reduced by more than one third. Courses affected cover programming and system development techniques, a spokesman noted.

A course on Auditable Internal Control Systems (Audics) — said to be a thorough presentation of the steps needed to develop DP systems that adhere to financial control requirements of the accounting profession — has been reduced from $525 to $325, he said.

In a course on developing user-oriented systems, Duos presents a case study of the step-by-step development process, as well as the forms and procedures needed to install the process, with any organization, the spokesman said. This course has dropped from $325 to $195, he added.

The instruction in the Cobol Training course begins with the basics of encoding principles and covers input characteristics, program hierarchy and the divisions of a Cobol program, the spokesman recounted. Students code arithmetic, logic and control statements and are able to write and document complete programs, he claimed.

Covering capabilities of both the 1968 and 1974 ANS Cobol specifications, this course has been cut in cost from $295 to $195.

Other courses offered by Info 3 include Computer Concepts for Small Business for $145, and an RPG II training series, consisting of four separate modules, for $475.

A locking briefcase and audio-cassette player/recorder is also available for $75, the company said from Suite 193, 21241. Ventura Blvd., Woodland Hills, Calif. 91364.

Correction

Although classified by IBM as an Installed User Program (IUP), the recently announced Query-By-Example (QBE) package [CW, Oct. 23] will have more support — and be subject to license fees for a longer time — than most IUPs, according to an IBM spokesman.

Most such packages are distributed "as is," without warranty, and have what amounts to newsletter-type support for six months after introduction. QBE users will have centralized program services "until otherwise notified," the spokesman said, adding that users will be given a minimum of six months' notice before discontinuance of such service.

The $325/mo license fee for the package is *not* waived after the first 12 months of continuous use — as is the usual practice with IUPs, the spokesman noted in conclusion.

On-Line Distributors

ELMSFORD, N.Y. — An on-line Wholesale Distributor System (WDS) package, recently announced by Mini-Computer Systems, Inc. (MCS) for use with the company's Data General-based Micos 100, 200 and 300 small business systems, consists of order processing, inventory control, cash management and sales reporting subsystems.

Although each of these application areas support appropriate data entry, file maintenance and reporting facilities, each package is customized to the specific needs of the acquiring organization, according to MCS.

The tailoring is initiated by a user representative selecting desired capabilities from a "shopping list" of options. With those choices in mind, an MCS systems engineer combines modules to create the customized system "in a matter of hours," the company claimed.

WDS can also be interfaced with MCS' Micaps general accounting packages, including general ledger and financial reporting, accounts payable, accounts receivable and payroll applications.

The WDS package is available to Micos hardware users for $17,500, he added from 525 Executive Blvd., Elmsford, N.Y. 10523.

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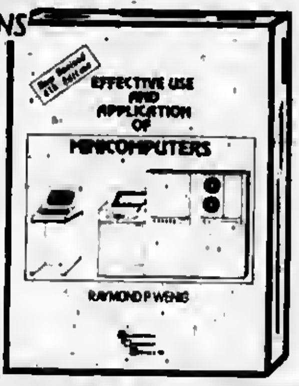
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Free-Form DOS 'Mark IV'

WOODLAND HILLS, Calif. — The use of free-form input to the Mark IV software from Informatics, Inc., previously an option only open to IBM OS installations, is now available to DOS/VS shops as well, according to a spokesman.

Free-form input provides users a terminal-oriented syntax which allows on-line development of Mark IV applications under CICS/VS and takes advantage of the capabilities offered by on-line text editors currently available, he added.

Mark IV has been described — by Auerbach — as "not a programming language/compiler in the usual sense of translating a set of statements into an independent object deck that must be link-edited before execution. It does compile code in main memory, however," based on entries in a set of specification forms.

Free-form input speeds program development within the DOS/VS shop by simplifying coding, reducing clerical errors and improving turnaround time, the spokesman claimed. Program testing, debugging and maintenance are all performed at the terminal, he added.

The logic for supporting the unstructured input is a separately priced option costing $2,300. The Mark IV Reporter costs $12,000; other DOS/VS implementations start at $30,000, the company said from 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

'Spread' Tracks Finances On Systems Backing Basic

HANOVER, N.H. — The Spread analysis and reporting system from Lupfer & Long, Inc. can be installed on any minicomputer or time-sharing service that supports Basic. In use, it enables users to create financial spreadsheets from a simple file, a spokesman said.

The file is built around English-language parameters, computation lines, textual annotations and data lines, he said, adding that the spreadsheet generated from this file may contain 24 columns representing such things as time periods, geographical regions, products or individuals.

Special columns for row totals and averages may be added. As many as 200 rows consisting of data lines, equations, percentages, totals, subtotals and cumulative row totals may be intermixed on the sheet, the spokesman continued.

No explicit report definition is necessary when using Spread: the order in which the rows are defined determines their order of appearance on the spreadsheet, he added.

Spread supports financial consolidation through a built-in file generation and access capability. Selected rows and columns from one spreadsheet may be used as input to another. A transaction file also allows the package to be used for personnel and project reporting applications.

Files used by Spread may be readily read or written by custom programs, allowing the generalized capabilities of Spread to enhance specialized application systems, the spokesman asserted.

A license to operate Spread is available for a one-time fee of $9,000. A combination offering of Spread and the Count general accounting and financial system [CW, July 10] is available for $19,000.

Lupfer & Long can be reached through P.O. Box 135, Hanover, N.H. 03755.

Vendor Resets Cost of 'Seed'

PHILADELPHIA — Effective Dec. 1, International Data Base Systems, Inc. (IDBS) will have new fees for its Seed data base management system and associated utilities. Seed is a Codasyl-type data base management system operational on a variety of computers.

With the change, the basic system may be obtained for $15,000 on large computers, $9,500 on a variety of large minicomputers and $8,750 on some smaller minicomputers. Up until now, all versions were available for $8,750, the spokesman noted.

Included in the new price structure will be two discounts. The first is 10% for educational institutions; the second is another 10% for purchase or rental of any three out of the four components that make up the complete Seed system.

IDBS is on the third floor at 3700 Market St., Philadelphia, Pa. 19104.

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Solution Worth Investigating

Processor Allows Polling on Packet Nets

By Ronald A. Frank
CW Staff

One of the problems that has inhibited more widespread acceptance of packet-switched nets has been the inability to perform polling of remote synchronous terminals. But the recent introduction of a new type of communications processor by Cambridge Telecommunications, Inc. (CTX) of Burlington, Mass. has provided at least a limited solution [CW, Oct. 30].

Most private-line network users today operate their networks in a polled environment. And unless an efficient method is developed to transfer the polling characteristics onto packet nets, these users will be slow to migrate, according to network experts.

The CTX 9100 offers users with binary synchronous IBM 3270 terminals the capability to operate on an X.25 packet network. As one of its features, the 9100 allows a user to effectively poll a remote terminal connected to the network.

A polling operation is really a request from a CPU asking a terminal whether it has traffic to send. In a binary synchronous net, polls are sent on a continuing basis along with acknowledgements. All of this requires frequent line turnaround operations.

The line turnarounds are unproductive on a packet net, especially when a user is being

Analysis

billed on a volume-sensitive basis. The X.25 protocol developed for packet nets allows the transmission of seven frames before an acknowledgement is required.

So users who install a 9100 at a remote terminal subsystem site can transmit seven terminal responses over the network before an acknowledgement is required.

The operation of the 9100 is transparent to CPU communications and applications software (to minimize the impact on existing user systems).

The 9100 works in conjunction with earlier CTX software installed in the user's IBM 370X front end. This package, called the Data Modified Emulator Program (Dmep), accepts normal polls from a typical IBM CPU.

The Dmep software effectively shifts the polling operation to the 9100 at the remote site. There the 9100 performs the polling with all necessary half-duplex turnarounds required by the 3270 terminals. The processor (which is actually replacing the 3271 terminal controller) only sends the responses over the full-duplex X.25 network back to the 370X.

The front end reconfigures this data stream, matching it with the earlier polls issued by the host, and the responses are then sent into the CPU.

The system still believes it is dealing with a binary synchronous network, thereby avoiding any major software changes.

Using these concepts, the 9100 can be used to poll remote terminals even if they are operating at remote sites with applications that may not be directly related to the host issuing the polls.

The 9100 is probably the first of a new breed of communications processors that will make it easier for users to incorporate X.25 links into their existing nets. The key to the concept is that expensive communications software upheavals are unnecessary. That point alone makes the 9100 concept worth investigating for network users.

DP Maker Builds Network Serving 102 Worldwide Sites

PALO ALTO, Calif. — Hewlett-Packard Co. is using more than 130 minicomputer systems at 103 sites around the world to enter, edit and transmit the 80 million characters of information it must send daily for its manufacturing, sales, service and corporate transactions.

Data communication is carried out between HP 2026 systems in batch mode, generally using standard dial-up telephone service. The network, referred to by its users as Comsys, also includes mainframe computers for special processing at the firm's headquarters in California and in Geneva, Switzerland.

"Our system has cut our communications costs dramatically," according to Bill Taylor, Comsys manager at the Palo Alto headquarters. "Whereas TWX costs 90 cents for a maximum of only 100 words a minute — about 600 characters — our system, with reverse channel protocol and advanced data compression techniques, costs 54 cents for a maximum of about 12,000 words a minute, about 72,000 characters.

"Our fully loaded costs for a 500-character administrative message average out to about 7 cents domestically and 15 cents internationally," he added.

Moreover, Taylor said, "data entry and retrieval can be done simply and accurately. The system is easy to use. The CRT terminals not only blink at you if you've entered incorrect data, but they indicate the exact data fields that are in error.

"The system, which is capable of more than 30 editing instructions, ensures accuracy of data. And it puts the data entry and data retrieval tasks out in the field close to the customer and field sales engineer. This reduces paperwork and speeds up the work flow."

Separation of Divisions

The distributed processing network arose largely out of a company philosophy that divisions should operate as separate profit and

(Continued on Page 48)

Network Design In Europe Aided

GREAT NECK, N.Y. — Network Analysis Corp. (NAC) has announced a European version of its Modular Interactive Network Designer (Mind) System. Called Emind, the package includes a tariff module that reflects British and European private-line costs and constraints.

In other respects, Emind has the same properties as NAC's Mind system. It is a system of software tools for designing networks and analyzing performance.

Access to both versions is offered on a time-shared basis under a license arrangement.

In the UK and Europe, Emind is being marketed by Pactel of London, England.

Network Analysis Corp. is at 130 Steamboat Road, Great Neck, N.Y. 11024.

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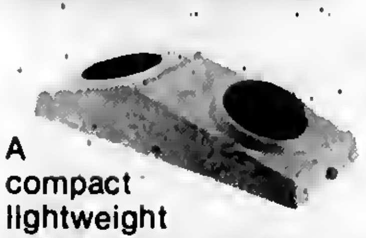

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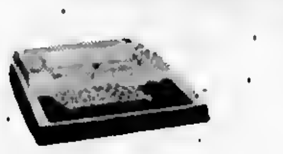
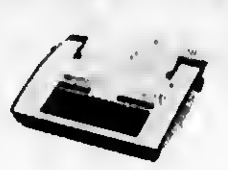
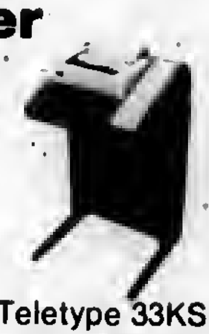


☐ TI 743 with 150A2-12B
$1437



☐ Teletype 43 with 150A2-14C
$1287



☐ Teletype 33KSR with 150A2-11D
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-terminals

DP Maker Constructs Net Serving 102 Sites

(Continued from Page 47)

loss centers. The company's decision to go to distributed processing — which led to the in-house development of the HP 2026 communications system — was supported by HP communications and data processing equipment.

The 2026 system — which can be used for source data entry, local data storage and retrieval, data communications and remote job entry — was successful in-house, so the firm began marketing it in May 1977.

The basic HP 2026 configuration consists of a 64K-byte HP 21MX-E series computer, a 20M-byte disk drive and an HP 2645 CRT as the system console. Multidropped HP 2654s are used for developing and running applications.

Many systems have additional disk storage, printers, magnetic tape and paper tape units. All applications are programmed in the Data Entry Application Language (Deal), with system utilities provided for file management, printing, record sorting, data communications and other functions.

Daily Transmissions

The communications network using these systems includes the Palo Alto corporate headquarters with links to 50 major cities in the U.S. and nine major cities in other countries. A secondary central site in Geneva, which has four 2026 systems, branches out to 15 European cities including Stockholm, which itself branches out to three other cities in Scandinavia.

Transmission to the major cities takes place up to six times daily. Although Hewlett-Packard uses the 2026 network for almost all aspects of its business communication, more than 60% of the 80 million characters transmitted daily are related to marketing or order processing.

An average order is about 525 characters long, and the network handles about 100,000 orders a month.

After a sales engineer takes an order, an operator keys the order information into a terminal at the nearest local sales office. The data is edited and stored on disk until it is transmitted in batch mode on the 2026 to the regional headquarters.

Transmission usually occurs twice a day. The regional office receives the order on its own 2026 system, along with orders from all the other branch offices, and routes it to the 2026 system in Palo Alto.

Several times a day the Palo Alto headquarters sorts all data on a large CPU for processing, final error checking and bookkeeping.

The mainframe then creates additional messages — for instance, shipping orders to go to manufacturing divisions. That evening, these messages are transmitted via the 2026 system to the appropriate manufacturing divisions.

In the morning, the manufacturing divisions print out these orders, and a scheduler enters acknowledgments into the system confirming both the receipt of the orders and the projected shipping dates. These messages are routed back through Palo Alto and on to the regional and local sales offices.

When orders are actually shipped, the manufacturing division transmits a message that contains the date, method of transport, motor freight number, number of cartons and weight, items partially shipped (with new dates for the rest of the order) and other pertinent information. The local sales office receives this information within 24 hours of actual shipment, and the information is thus available for sales and customer inquiries.

No Programmers

Deal, the programming language of the 2026 system, requires no specialized programming knowledge. Deal consists of a series of menu screens which allow the user to design his own terminal screen formats, as well as to define the edit instructions necessary, specify the output requirements and create a data entry job which can be called upon when needed.

Using Deal, HP personnel designed six different screens for entering an order and about 700 different screens for all systems combined.

According to Taylor, the HP 2645 terminals are easy to use, generally taking only a couple of hours to learn. Data entry is simple, he added, since all fields are shown in inverse video display, and the operator fills in the blanks.

Once the operator enters all the data and presses the ENTER key, the system notifies the operator of any error conditions by "blinking" the erroneous fields and also by means of error messages. Errors can thus be diagnosed and corrected.

The system's editing capabilities include not only alpha or numeric checks and right justifying, but also table lookups, disk file searching to verify and/or retrieve data, arithmetic functions and logical decisions based on flag conditions.

All customer, product and order status information is maintained on the central computer, which can download subfiles to the local sales offices. To access these files on the 2026 system, HP is now making available to its local sales offices an application called Sales Office Data Access System (Soda).

An order coordinator can use an HP 2645 terminal and, with Soda, retrieve information in seconds, either by customer name, customer purchase order number or HP's order number. Since files are updated daily, all information is current.

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New 4100 series Info-guard security modules now add network protection to Motorola's line of data security products. They incorporate the NBS data encryption standard algorithm and are compatible with virtually any communication protocol or data format. Either dedicated or switched line computer systems. They are equally effective in protecting your data from unauthorized or accidental access when installed at host computer or remote terminal sites.

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For more information, call James Booth 602/949-4735 or write him at Motorola's Government Electronics Division, Dept. L-5, P.O. Box 2606, Scottsdale, AZ 85252.

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Cubic HD is manufactured by a new process and utilizes an enhanced proprietary oxide formulation that provides optimum signal recovery and incorporates a cross-linked binder for reduced oxide shed. The benefit is a cleaner running tape with less error-rate buildup.

In short, testing at 6250 bpi plus a thicker base film plus SuperReel plus a new proprietary oxide formulation and process equals an optimized computer tape for high density applications—Cubic HD.

See your Memorex Computer Media representative to find out all about it. Offices in principal cities worldwide, or contact us at 1200 Memorex Drive, Santa Clara, California 95052. Phone toll free (800) 538-8028. In California, call collect (408) 987-2410.

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Computer Media Products

Datapoint 3600 Given Detachable Keyboard Option

SAN ANTONIO, Texas — Datapoint Corp. has introduced a version of the 3600 CRT workstation with a detachable keyboard option that allows they keyboard to be extended up to one meter from the display unit.

The 3600 is used in Datapoint's system and allows users to access the DP and data storage capability of the system. It can be used with an optional terminal printer and includes a standard software switch that lets application programmers command the terminal printer to be turned on or off under application program control without operator intervention, Datapoint said.

The latest 3600 version retains the glare-free screen that eliminates reflections and operator fatique. It can be ordered with or without the detachable keyboard, but the option must be ordered from the factory and is not field-upgradable.

The Datapoint 3600 can be purchased for $1,950; the keyboard option costs an additional $250. Rental rates are $77/mo for the 3600 alone and $86/mo with the removable keyboard option. Maintenance for either model is $20.

Shipments will begin immediately from Datapoint Corp., 9725 Datapoint Drive, San Antonio, Texas 78284.

Bunker Ramo System 90 Given 3270 Emulation

TRUMBULL, Conn. — Two emulation programs based on read-only memory (ROM) firmware are now available for Bunker Ramo's System 90 intelligent terminal system, that company announced. IBM 3270 emulation is provided by the System 90 Model 90/32 control unit, and emulation of Bunker Ramo's Series 2200 terminal system is offered by the 90/22 control unit.

The Model 90/32 control unit lets a customer install System 90 as a remote 3270 system without any changes in the host communications or applications programs. By substituting a random-access memory (RAM) module for the ROM board, the system can later be field-upgraded to make use of System 90's programmability.

The 90/32 supports up to 20 1,920-char. displays or up to 32 480-or 960-char. displays or a mix of large and small displays.

The 90/32 eliminates 3270 downline loading requirements in a system 90 terminal subsystem, a spokesman said.

The Model 90/22 control unit emulates Bunker Ramo's Series 2200 equipment, with improvements. The new system supports up to 32 displays and increases the number of addressable printers to six. The 11 different Series 2200 screen layouts of 222-to 1,032 characters are switch-selectable, as is asynchronous or synchronous communication.

Users of IBM 3270 type equipment can now install compatible gear without any system changes and can easily upgrade System 90 to an intelligent terminal system. The company stated that the Model 90/32 Control Unit purchase price can represent a 20-to 35% savings over a comparable IBM 3270 system.

A typical System 90 subsystem including a 90/32 controller with eight 1,920 CRTs that are 3277 equivalent units costs "under $23,000" without maintenance, a spokesman said.

Bunker Ramo is at 35 Nutmeg Drive, Trumbull, Conn. 06609.

Terminal Suits Minis, Micros

LANHAM, Md. — Computer Operations, Inc. has announced the Model CO 4420 Serial Box terminal for mini- and microprocessors. The terminal was designed for noncomputer-room environments and applications where ruggedness and ultra-high reliability are a must, the company said.

The field-tested Serial Box has a direct-access 336,000-byte tape drive. Its uses include program loading/data logging for military applications, oil exploration, field service firms, the medical industry, universities and other such mini-and microcomputer users.

Serial Box interfaces via RS-232 or current-loop interface at selectable transmission speeds from 110-to 9,600 bit/sec. Features include full Ascii keyboard, electroluminescent display, RS-232 port and microprocessor controller.

The Model CO 4420 costs $3,495. A modified version (without keyboard and display) is priced at $2,595. Delivery is 45 days from Computer Operations, Inc., 9700-B George Palmer Highway, Lanham, Md. 20801.

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Design a computer-based system to realistically simulate the flight, tactics, and missions of an A-6E Trainer under normal and emergency conditions. Twin Interdata 8 32 Megamini "flight-simulation computers interfacing with a 7 32 simulation computer were the answer.

NUMERICAL CONTROL—SPACE SHUTTLE

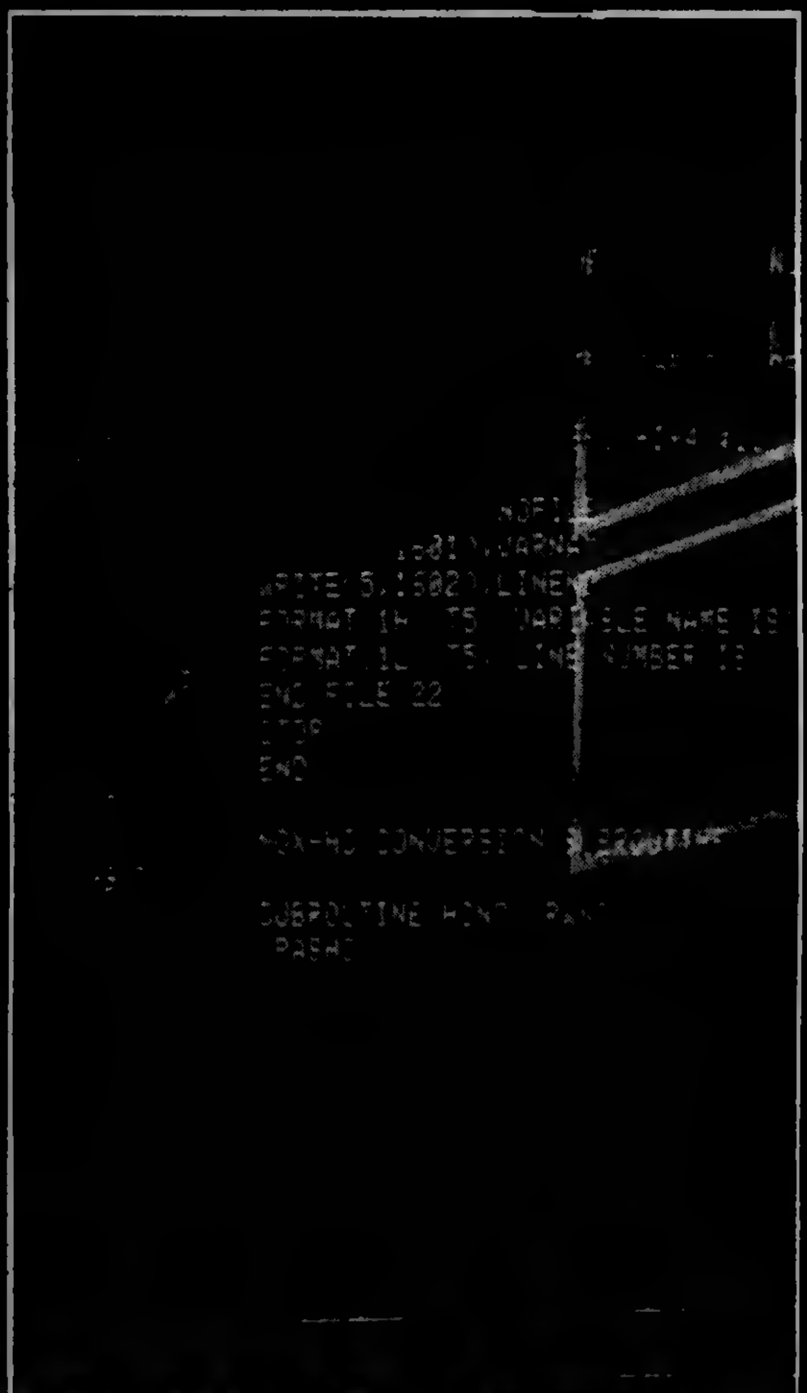
Space shuttle heat shields are being designed consisting of 34.000 tiles of high-purity silica insulation—each unique in size and shape. The Interdata 7 32 was selected to control a measuring machine which automatically guides the milling of the tile s contours

PATIENT RECORDS

Design a computerized record system for a group of physicians that will provide detailed diagnosis, billing, and accounting information of 6,000 patients. The solution was an Interdata 7 32 system that includes mass storage units, operator interface terminals, CRT s, and a line printer

POLLUTION EQUIPMENT DESIGN

A firm specializing in reversing the effects of water and air pollution has developed an ozone generator to neutralize pollutants The generator, designed with the aid of an Interdata 5 16, compresses air and then forces it through a high-voltage, high-frequency electric field The ozone gas combines with the pollutants to produce nonpolluting by-products



Interdata's steady growth and the need to continually develop products and systems that reflect the latest advances in hardware and software technology have created immediate opportunities for computer professionals with development experience in the following areas:

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- Utilities
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- Compilers
- Networks
- Diagnostics
- Quality Assurance
- Data Base Management Systems

HARDWARE

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Tektronix Unwraps Portable On-Site Tester

BEAVERTON, Ore. — Tektronix, Inc. has developed the 832 Data Comm Tester, a portable test instrument for on-site service of data communications systems.

The 832 offers many of the same diagnostic capabilities found only in bench-type analyzer/emulators. Operators can verify system performance, identify and troubleshoot faulty system elements, solve hardware handshake problems and perform alignments and adjustments with a minimum of time and difficulty, the firm said.

The 832 tester can be used in servicing major components of a data communications system which use either EIA standard RS-232C or CCITT V.24 or current loop interfaces.

The firm added that by "pointing the finger" at a faulty subsystem, the 832 can eliminate hours of frustrating and futile activity and then be used to stimulate the subsystem, locate the malfunction and check its operation after repair.

The 832 operates in four modes: monitor, simulate, echo and repeat.

In the Monitor mode, the test set will record both data terminal equipment data and data communications equipment data, either synchronously, asynchronously or (with the proper option) under High-Level Data Link Control (HDLC). It will also record the status of key interface lines.

In the Simulate mode, the 832 simulates the operation of a modem. The test set can send a message to the terminal and record its response. This data can be sent directly from the 832 or can be transmitted upon receipt of a preselected trigger from the terminal.

In the Echo mode, the 832 will accept and record data directly from the terminal and return record the same data for display. This feature permits the isolation of problem causing send or receive circuitry on asynchronous systems.

In the Repeat mode, the 832 will send data repeatedly to the terminal or can be programmed to repeat the transmission only upon receipt of a preselected trigger character from the terminal.

In any mode, the test set can operate on either full-or half-duplex lines with 5-to 8-bit characters and with odd, even or no parity. Transmission rates are switch-selectable from 50- to 9,600 bit/sec or can be synched to either the terminal equipment or communications equipment clocks, Tektronix said.

The 832 costs $1,595. The current-loop interface is an additional $300, the HDLC monitor option $225 and the self-test adapter $100.

Tektronix, Inc. can be reached through Box 500, Beaverton, Ore. 97077.

Decision Data Offers Printer For IBM 3270

HORSHAM, Pa. — Decision Data Computer Corp. has introduced a printer for the IBM 3270 information display system which reportedly provides increased performance and lower prices than most matrix printer models available from IBM.

With performance characteristics said to be equal to those of the 3287 Model 2 printer, but significantly lower in price, the Decision Data 6540-02 was designed for users of the lower performance matrix printers presently available. In most cases, users will be able to obtain significant increases in performance while lowering their costs substantially, the firm said.

The printer can be attached to the IBM 3271, 3272 and 3274 control units as direct replacements for the IBM 3284, 3286, and 3287 serial printers. In addition, multiple 6540-02 serial printers can replace the 3288 and 3289 line printers with improved overall cost/performance benefits.

The 6540-02 prints bidirectionally at 120 char./sec over a 132-position print line. Characters from the set of 96 are formed by a 9 by 7 dot matrix. Forms are sprocket-fed and may be up to five parts in thickness. Also included is a 4,000-char. buffer.

Monthly rental prices, including all interface attachments and maintenance, range from $130 to $175 depending upon contract term. The purchase price is $3,975 with delivery in 90 to 120 days from Decision Data Computer Corp., 100 Witmer Rd., Horsham, Pa. 19044.

Control Terminal Runs on 5Vdc

NASHUA, N.H. — Termiflex Corp. has announced an updated version of a small, control/display terminal unit that simplifies control and operation of microprocessor-and minicomputer-based equipment and test apparatus.

The Termiflex Model HT/2 has been upgraded to operate on 5Vdc only; the 12Vdc needed for the standard RS-232C interface is developed within the unit. Use of fewer components than the original HT/2 cuts power requirements by one-third and promotes reliability, the firm said.

The HT/2 control display unit is priced at $1,995; factory upgrading of existing units costs $995.

Termiflex Corp. is located at 17 Airport Road, Nashua, N.H. 03060.

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The CMC is a high performance microprocessor directed controller that emulates the IBM 2701 transmission control unit for IBM I, II, III, TTY II and SDA II line disciplines. It occupies less than 1.3 cubic feet of space and can replace up to two IBM 3704's or IBM 2701's at a fraction of their combined cost. EIA RS 232-C and wideband interfaces offer high throughput in an extraordinary reliable and compact package.

DPF Incorporated, a Fortune 500 company, is one of the largest independent computer leasing organizations in the United States. Through its computer leasing operation, DPF services a broad range of leading corporations, institutions and governmental agencies. It owns and/or manages a computer portfolio with an original manufacturers price approaching one-half billion dollars.

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To represent a broad cross-section of methods, we've invited representatives from the leading consulting/training organizations in the U. S. to present their own particular design orientation. We've also invited a local speaker in each of the 18 Forum cities to present a luncheon address on a timely topic related to software development.

The Program

The agenda for the one-day Structured Forum will consist of presentations on:

- Warnier/Orr methodology by a representative of **Langston, Kitch & Associates.**
- Jackson Design methodology by a representative of **Infotech International.**
- Constantine/Myers/Yourdon methodology by a member of the **Structured Methods** staff.
- Database Design by a member of the staff of **DBD Systems.**
- **Human Resource Development in a Data Processing Environment** by a representative of **Edutronics/McGraw-Hill.**

Attendees will be provided with all Forum materials including the conference proceedings. A buffet lunch will be served and all attendees are welcome to join the speakers in informal conversation during a wine and cheese gathering following the presentations.

The Fee

The fee for the Structured Forum is $175 and groups of three or more will receive a 10% discount. All Attendees will receive a $100 credit which can be applied toward Structured Methods or Edutronics services or against a list of selections from the McGraw-Hill Computer Science Library.

The Dates

The Structured Forum will be coming to 18 cities between Thanksgiving and Christmas:

New York	Nov 28	Denver	Dec 11
Boston	Nov 29	Kansas City	Dec 12
Toronto	Nov 30	Dallas	Dec 13
Detroit	Dec 1	Houston	Dec 14
Chicago	Dec 4	St. Louis	Dec 15
Minneapolis	Dec 5	Atlanta	Dec 18
Seattle	Dec 6	Columbus	Dec 19
San Francisco	Dec 7	Wash., DC	Dec 20
Los Angeles	Dec 8	Philadelphia	Dec 21

We are looking forward to meeting with you.

Structured Methods

Our winter schedule lists the courses coming to you soon. If a convenient time or location do not appear, or, if you desire more information, contact us at any of our listed numbers. We can try to arrange a special presentation of the appropriate subject. For those of you who might be hearing of us for the first time, Structured Methods offers training and consulting in software engineering techniques. Our seminar leaders / consultants are proven practitioners of structured system development and data base technologies. We will be pleased to provide you with references.

Seminar Schedule/Winter 1979

COURSE	DAYS	FEE	JANUARY	FEBRUARY	MARCH
Reviews, Walkthroughs and Inspections	2	$350	22-23 Dallas	14-15 New York 22-23 San Francisco	22-23 Chicago
Modern System Development – A User Perspective	2	$350	11-12 Chicago	12-13 Dallas	19-20 Washington, DC
Comparative Design Methodologies	3	$625	31-2/2 San Francisco	14-16 Houston	21-22 Boston
Quality Assurance & Testing Workshop	5	$675	22-26 Chicago	26-3/2 New York	19-23 Dallas
Managing Systems Development – A Structured Approach	2	$350	11-12 Washington, DC 25-26 San Francisco	15-16 Chicago 26-27 Charlotte	12-13 New York 29-30 Denver
Structured Design	3	$525	8-10 Pittsburgh 22-24 Indianapolis	26-28 Boston	
Structured Analysis	2	$350	11-12 Pittsburgh 25-26 Indianapolis	12-13 Little Rock	1-2 Boston
Structured Analysis/Design Workshop	5	$675	15-19 San Francisco 29-2/2 New York	5-9 Dallas 26-3/2 Chicago	5-9 Washington, DC 19-23 Los Angeles
Structured Design/Programming Workshop	5	$675	15-19 Houston 29-2/2 Los Angeles	5-9 Chicago 26-3/2 Richmond	12-16 Cincinnati 26-30 New York
Structured Programming for COBOL Programmers	2	$350		20-21 San Francisco	
Structured Programming for PL/I Programmers	2	$350		22-23 Chicago	
Infotech/Jackson Design Technology Workshop	5½*	$850	22-26 Washington, DC		26-30 Minneapolis
IMS/VS Data Base Design	5	$675	29-2/2 Houston		12-16 Chicago
IMS/VS Programming	5	$675		5-9 Washington, DC	5-9 New York
IMS/VS DC Programming	2	$350		15-16 New York	
TOTAL Data Base Design.	3	$525			12-14 Washington, DC
Systems Design in a Data Base Environment	2	$350		26-27 Dallas	
Designing Effective Data Bases	3	$525		28-3/2 Dallas	

*Monday through Friday, Saturday morning and three evenings during the week

Fees include all class materials, lunch, continental breakfast and coffee breaks

Discount Policy

Course registrations for groups of three or more are entitled to a 10% discount. Registration for consecutive courses are priced as follows:

Structured Analysis & Structured Design	$675
Systems Design in a Data Base Environment & Designing Effective Data Bases	675

In-House Policy

Structured Methods also offers all of its courses on an in-house basis. Furthermore, we are able to tailor any course to meet a client's specific needs. For more information, call us. We will be happy to provide you with prices, references, and scheduling information.

Registration

To register for the Structured Forum or for any of our other courses you can use the attached postcard, call us on our toll-free number **800–223-0343** or one of our local numbers:

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For Further Details See Page 33

With 56K-Bit Loops

UCS Planning Expansion of Uninet

By Brad Schultz
CW Staff

KANSAS CITY, Mo. — United Computing Systems, Inc. (UCS) will expand its Uninet digital communications service by building three 56K-bit communications loops in the U.S. to provide both remote batch synchronous and interactive asynchronous access to the service bureau's Kansas City, Boston and London data centers.

UCS plans to improve cost-effectiveness by multiplexing both remote batch and interactive traffic into the same data stream for reception at its data centers, according to Jim Klein of the bureau's network support department. UCS will thus move away from Wats, dial-up communications from the field to a private-line, packet-switched arrangement.

This move will lower user overhead, and the redundancy aspect of the featured alternate routing as well as load leveling will improve service for the end user, Klein added.

Turnaround will be enhanced by load leveling and automatic rerouting capabilities as well as a positive/negative acknowledgment procedure in the featured software.

The first loop will join Kansas City, Dallas, Houston and Atlanta, Klein said. The next available loop will join Chicago, Cleveland, New York, Washington, D.C., and Philadelphia. A third loop is planned for Denver, San Francisco and Los Angeles.

Uninet access is currently nationwide and throughout Europe, Klein continued, maintaining that "a man from Houston can communicate with London as easily as with Kansas City."

All of Europe is open to the bureau's domestic users via a network managed by Fidef, a bank headquartered in Zurich, Switzerland. By the same arrangement, all of the U.S. is open to European users, Klein noted.

The Kansas City facility provides access to an IBM 360/165 and Cray Research, Inc.'s Cray-1, reputed to be the world's fastest computer system with its 12.5 nsec processor cycle time.

UCS has thus become the first and only commercial user of the Cray-1, and it indicated that another Cray-1 and its successor Cray-2 still under development are being eyed for acquisition [CW, Sept. 18].

Control Data Corp. CPUs in Kansas City available to Uninet users include three 6600s, two 6400s, three 3300s, two Cyber 175s and one Cyber 174.

The Boston UCS facility features three CDC 3600 mainframes and the London center has two of the vendor's 6500 CPUs.

The extended Uninet service entails no additional charge to the network's customers, Klein said, indicating the improved service will be available within the next few months.

A major portion of Uninet traffic involves scientific applications, Klein observed, although he said UCS customers come from a diversity of environments, making the "typical" user hard to imagine.

UCS is at 2525 Washington, Kansas City, Mo. 64108.

AMLC for Prime Systems Enhances Data Throughput

WELLESLEY HILLS, Mass. — An asynchronous multiline controller (AMLC) that enhances communications throughput and reportedly reduces CPU overhead on Prime 350, 400 and 500 systems is available from Prime Computer, Inc.

The AMLC reduces CPU overhead by cutting the number of interrupts generated and serviced by the device software, Prime said. It utilizes microcode to establish and maintain buffers for output data to provide processing of characters sent over asynchronous lines, according to the firm.

The AMLC uses a direct memory queued I/O mode that allows the CPU firmware to assist in maintaining relatively large transmit data queues for each line. As a result, the interrupt occurs at only 10/sec, irrespective of the line speed. This lowered interrupt rate significantly reduces CPU overhead, the firm claimed.

Actual tests on a Prime 400 have shown approximately a 4:1 reduction on the CPU overhead when servicing 9,600-bit/sec terminals, according to a spokesman.

The AMLC fits in all current 17- and 24-board Prime 350, 400 and 500 system chassis. It cannot be used on Prime 300, 200 or 100 systems. The device supports RS-232C, CCITT V.24 and 20 mA interfaces.

An eight-line, high-performance AMLC costs $3,500, with a monthly maintenance charge of $18. A 16-line AMLC costs $4,000, with a monthly maintenance charge of $21.

Prime Computer is at 40 Walnut St., Wellesley Hills, Mass. 02181.

GDC Netcon-5 Gains Features

DANBURY, Conn. — General Datacomm Industries, Inc. (GDC) has added several features to Netcon-5, its network diagnostics and control system.

The enhanced Netcon-5 system features a configuration capability that is flexible in any type of analog network and can accommodate more than 32,000 addressable points within a network, according to a spokesman. In addition to the Bell 201, 202, 208 and GDC 9601 types of modems, Netcon-5 is now compatible with the Bell 209-type modems and can operate with time division and frequency division multiplexing systems, the company said.

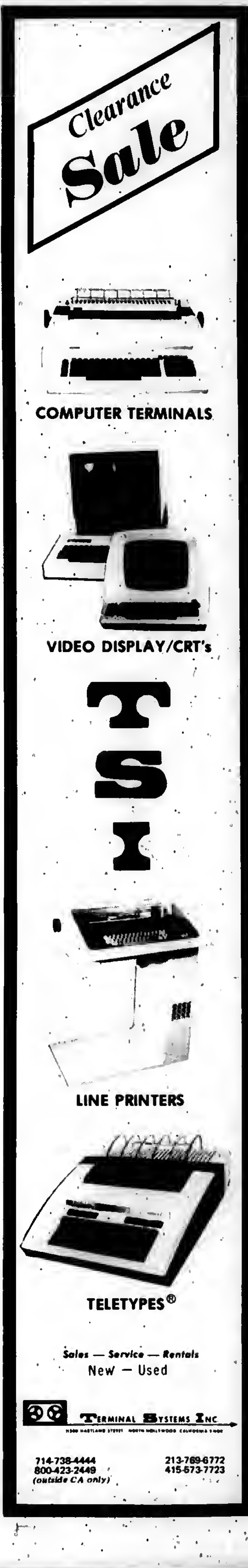
A hard-copy printer option is available with the enhanced system to provide a printout of the remote site address and malfunction.

Additional features of Netcon-5 include parallel polling, integral diagnostics for Bell 202-9D, 201-7, 208-9A and 4801EL modems, automatic test sequencing and remote line level measurements. A major advantage of Netcon-5, according to the spokesman, is its noninterfering nature of operation as a result of using 75 bit/sec asynchronous, full-duplex diagnostic secondary channels as the means of sending and receiving diagnostic commands and data.

Netcon-5 utilizes a building block concept which allows a user to expand both the diagnostic capability and the data network by adding rather than replacing components in the system.

The Netcon-5 system ranges in price from $25,000 to $250,000.

General Datacomm is located at One Kennedy Ave., Danbury, Conn. 06810.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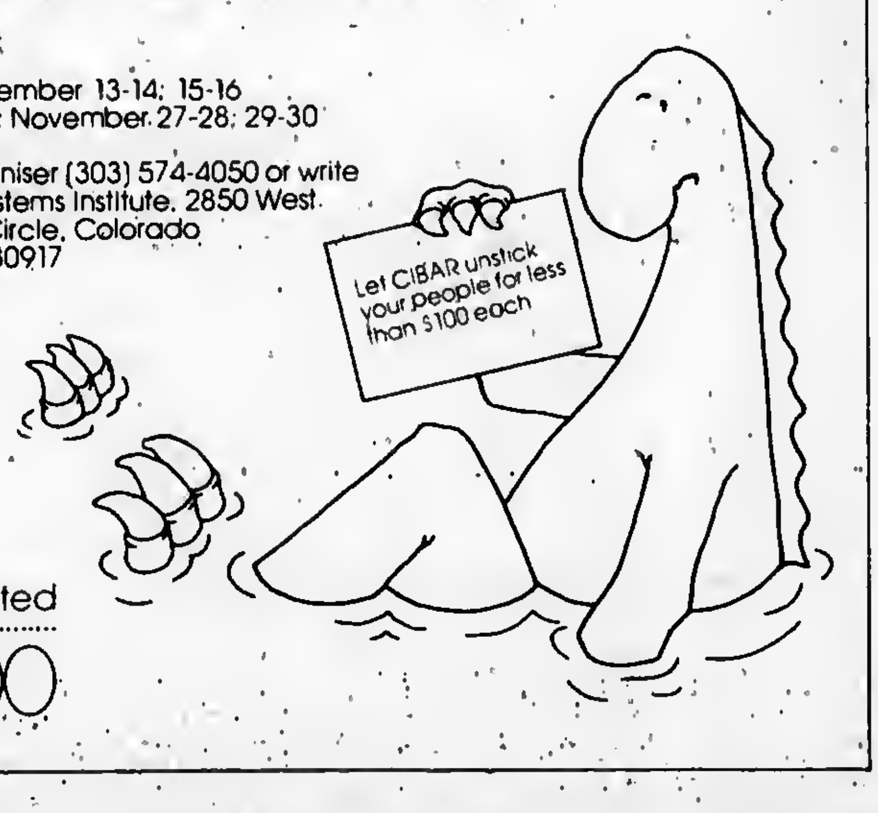
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Stand-Alone Terminal Has User-Alterable Fonts

STANFORD, Calif. — Aimed at the OEM or home user, the Electrolabs Esat 200B single-board, stand-alone terminal features user-alterable fonts, split-speed serial communications and compatibility with RS-232C, 20 mA current loop and TTL interfaces.

Two fonts of up to 128 characters each are contained by the terminal's electronically programmable read-only memory (Eprom).

Fonts are programmed into 256 7 by 8 dot matrix cells for contiguous display, Electrolabs said, explaining that "anything may be programmed into these character cells, including Middle Eastern alphabets, APL characters and limited graphics."

Eprom With Font

The Esat 200B is deliverd with one Model 2708 Eprom module and one empty Eprom socket. The prewritten 2708 contains upper and lower case Ascii character sets; the empty socket is meant to house a second Eprom into which a second font may be written by the user.

However, the user that doesn't have an Eprom programmer may specify a second font by penciling in certain spaces on a printed grid included with the terminal. Electrolabs will send an Eprom module customized to fit these user specifications upon receipt of the grid and $50, the vendor said.

The Esat 200B contains only 85 integrated circuits, a characteristic said to account for lower cost, greater reliability, less expensive maintenance procedures and smaller size.

The terminal also features an addressable, "nondestructive" cursor and page transmission and draws 15W of power, Electrolabs added. Keyboard input is 7- or 8 bits with negative strobe, and video output is selectable RS-170 composite video or separate horizontal and vertical drive.

The Esat costs $329 with quantity discounts available, the vendor said. The firm can be reached through P.O. Box 6721, Stanford, Calif. 94305.

Detachable Keyboard Fits Adds Terminals

HAUPPAUGE, N.Y. — Applied Digital Data Systems, Inc. (Adds) has announced a detachable keyboard option for its standard microprocessor-controlled Regent terminal product line. The detachable unit includes a keyboard that can be placed up to 14 in. from the terminal's display screen.

The Regent 100 and 200 detachable terminals are intended for applications where flexible positioning of the keyboard for operator comfort is important, the vendor said. They may typically be used in offices or laboratories or in keypunch replacement data entry and suit other work environments with long terms of duty.

Adds is shipping detachable Regent terminals in production quantities. The single-quantity end-user cost is $95 more than the standard Regent 100 and 200 terminals, the vendor said, noting that OEM discounts are available.

Sixty days should be allowed for delivery, and customers may mix orders of detachable and standard Regent terminals to receive optimal quantity pricing, Adds said from 100 Marcus Blvd., Hauppauge, N.Y. 11787.

Printer Ties To Telephone 'In Seconds'

PARK RIDGE, Ill. — A desktop terminal printer with built-in modem claimed to be attachable "in seconds" to a Western Electric Co. modular telephone is available from Management Response Corp. (MRC).

The Model 43 terminal needs no acoustic coupler to accommodate a telephone and features a full Ascii character set, buffered keyboard, 10- or 30 char./sec operation, 132 column format and an impact printhead, the vendor said.

The Model 43 can be purchased for $1,587 or leased for $45/mo, the vendor said, noting that the Bell System offers the product only on lease.

MRC is at 660 Busse Highway, Park Ridge, Ill. 60068.

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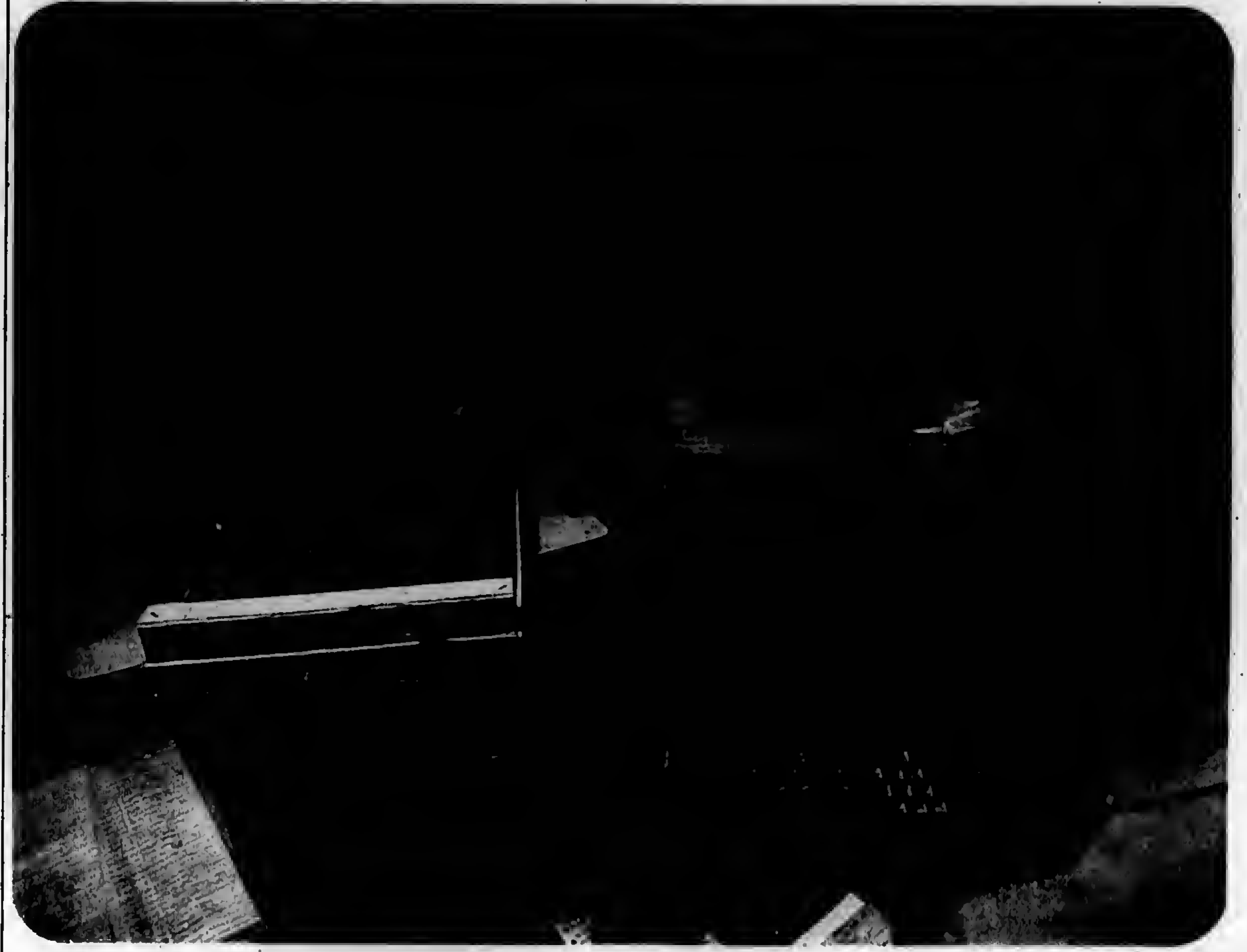

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Pierre Lamond
Technical Director

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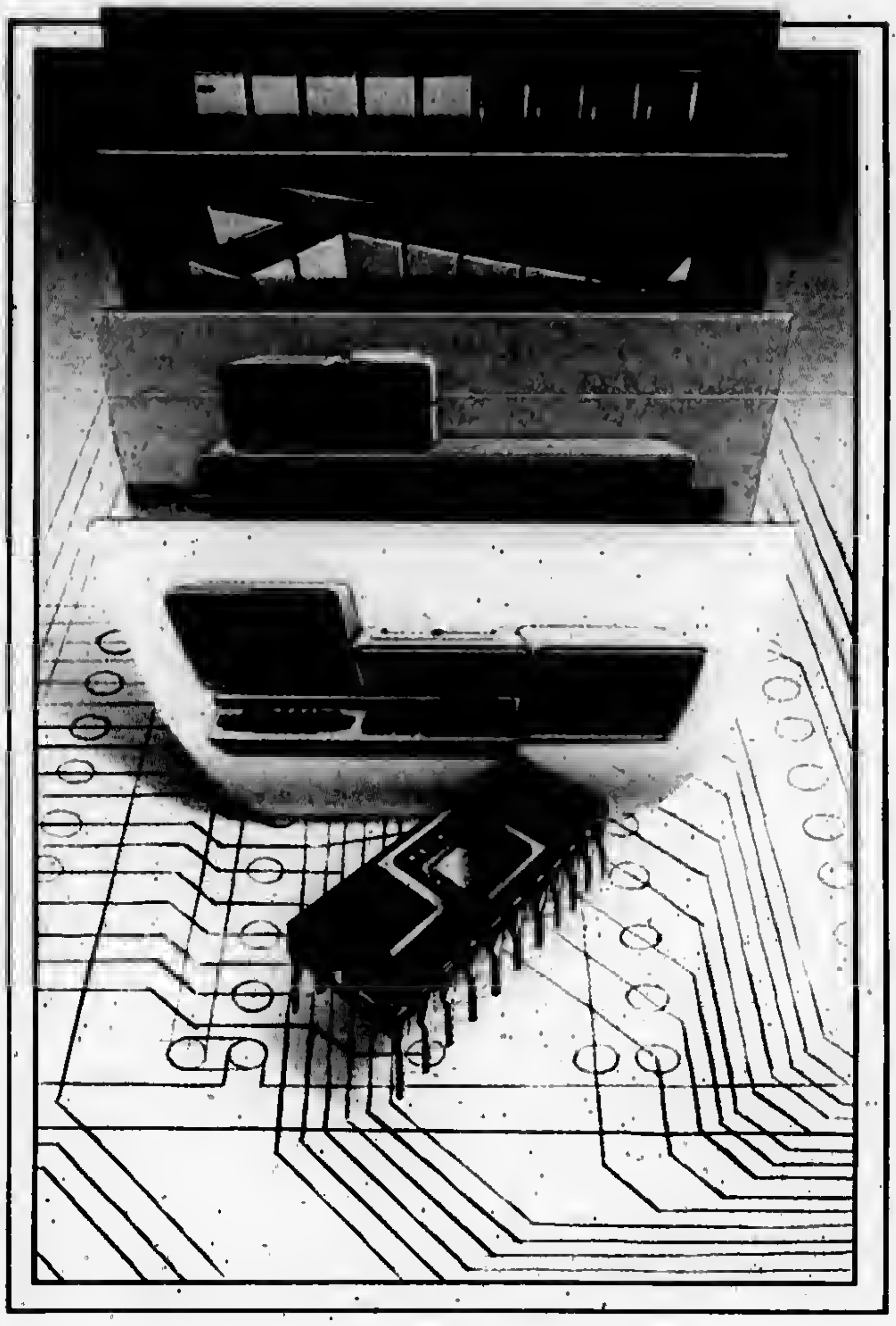

And not only do we build add-on memory systems, in many cases we build the IBM-equivalent mainframes to which they attach. This means we can design even the most minute components to carry out incredibly specific tasks in highly-integrated systems of our own making. As a result, customers get degrees of performance, reliability and price they won't find anywhere else.

None of our computer products would have been possible without breakthroughs like sophisticated bit-slice microprocessing; low-cost, volume-produced memory and logic; and the large-scale use of microcode — three examples of the semiconductor technology that's rapidly blurring the dividing line between chips and systems.

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We've been doing a lot of talking lately about a new wave computer technology. Actually, this is simply the latest manifestation of National placing more and more functions in less and less space. The ultimate result is that we can offer users complete systems for less money than many traditional computer companies — a fact that should make the next decade a period of substantial growth and profitability.

If there's more I can tell you about National Semiconductor, and the directions we'll be taking in the next ten years, I'd be glad to fill you in. Write me personally: Pierre Lamond, Technical Director, National Semiconductor Corporation, Drawer 19, 2900 Semiconductor Drive, Santa Clara, California 95051."

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Could Be Boost to Third World

Worldwide State of Data Entry Analyzed

By Howard A. Karten
CW Staff

SAN DIEGO — Although data entry is a standard procedure in the U.S. and Western Europe, it has "barely started" in Eastern Europe and is "virtually embryonic" in the Third World, which is still largely in the precomputer age. But in the West, the age of computers is virtually a second Industrial Revolution.

However, distributed processing and data entry could be a big help to Third World countries, since these activities can serve to distribute computer expertise and data — now typically residing in governments, banks and new industrial organizations — if some of the problems associated with these activities, such as the lack of phone lines, can be overcome.

That is the view of Michael J. Aldrich, a director of Redifon Computers, Ltd., the second largest British-owned computer manufacturer. Aldrich, speaking recently before the second annual Data Entry Management Conference in San Diego, contrasted the current situation in the West, the East and the Third World.

Aldrich credited the development of key-to-media units in the West to the advent of "powerful computers with voracious appetites for data," which have appeared only recently in the East.

'Quantum Improvement'

"There is rarely enough expertise to put processing at the local site," Aldrich continued. However, although information in the past was gathered and disseminated slowly, "now it can be done in a few days or weeks — a quantum improvement. In one generation, people are changing from peasants to computer operators."

However, although "the social, cultural, educational and technological gap is being closed," the process is slow for most of the people.

One of the particular advantages of distributed processing and data entry for the Third World is the simplicity of the equipment now being introduced, Aldrich went on. "Because [such systems] work in normal office or factory environments, they are used by people who are not computer experts," the director noted.

Although the move to data entry and distributed processing systems is an evolutionary process in the West and the East, it is a revolutionary change in the rich Third World, he asserted.

No Hand-Me-Downs

Despite the nature of this change, however, the Third World will not be satisfied merely by technological cast-offs of the West and East, Aldrich explained. "The superannuated card punches of the West will not find new users in Asia and Africa. The Third World wants the latest, the best and the cheapest," he added.

Turning to the subject of data entry in Eastern Europe, Aldrich noted that part of the world uses few Western computers. "An indigenous computer industry exists and thrives. The Russians, the Poles, the Hungarians [and others] build their own computers within an overall model strategy, called the Riad Plan," he stated.

Since no provision was made under this plan for a locally produced data entry system, Poland took a manufacturing license with an English company to build and market such systems; the product subsequently became part of the Riad Plan. As a result, Western suppliers do market such systems to the East, although not in great volume, with the most widely installed Western system produced in the UK.

Another example of the difference between approaches taken by the East and West lies in the applications each undertakes on the equipment. Eastern applications tend to be far more complex, Aldrich said. "The prime directive is to squeeze every possible ounce of productive work out of the system. I know of systems doing processing jobs that one would hesitate to attempt on reasonable-sized mainframes. Operation of these applications is usually inelegant, but the job somehow gets done," he explained.

"In classic data entry applications in the East the productivity of the best operators equals the best anywhere in the world," Al-

(Continued on Page 68)

Mainframe Uptime Termed 'Phenomenal' by Rental Firm

By a CW Staff Writer

PHOENIX — The Maytag washing machine repairman is somewhat like the customer engineer (CE) at U-Haul International, Inc., according to Lawson Roberts, chief administrator and director of design (DP director) for the company: both have little to do.

"Uptime on our Itel Corp. AS/5 Model 3 has been phenomenal — it's been several months since the AS/5 caused a failure. In the past three or four months, we've been down no more than five or six times, and none of these incidents were caused by the Itel unit," Roberts noted in a recent telephone interview.

Roberts said the company purchased the system without doing any kind of benchmark first. "I don't know of any really accurate way to benchmark," he explained. "You can run something one-on-one and maybe prove the absolute speed of the hardware, but I felt that Itel was saying it had a device that worked. If it didn't work, what could they do? They would have to take the system back, under basic contract law."

Before obtaining the system, U-Haul had relied on an IBM 360/65, which it used up until early this year. "We are not a leading-edge company," Roberts commented.

When an increasing workload convinced the company of the need for more DP power, it initially ordered an IBM 370/158 Model 3. However, Roberts explained, "it was obvious that something was going to happen in the near future, so we decided to wait a bit. In fact, we were waiting for some sort of announcement from IBM when Itel contacted us."

Initial Insecurity

Initially, the board of directors of the nationwide trailer company was "a bit antsy" about leaving the security of IBM, Roberts noted. One of the things that convinced the company to choose Itel was the fact that it and U-Haul are about the same size: "If we were marketing something, you bet we would be sure to back it well — there's far too much there [in assets] to risk in a suit. People will come after those assets if you don't perform as you have specified."

U-Haul hasn't sufered in any way by go-

(Continued on Page 68)

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HP Impact Printer Turns Out 180 Char./Sec

PALO ALTO, Calif. — A printer recently introduced by Hewlett-Packard Co. features a dot matrix printhead capable of printing at 180 char./sec, according to the company.

The HP 2639A impact printing terminal is available with both RS-232C and serial interfaces and can handle a transmission speed of up to 9,600 bit/-sec, the company said.

The synchronous Ascii interface comes with a standard 1K-byte buffer and can be configured for several different block data transfer sizes. This minimizes the overhead directed by the host CPU to control data transfer, the company noted.

A "printer busy" state can be selected at different capacities of "full buffer," ranging from 30% to 100%. A "printer not busy" state can be independently selected at 0%, 10%, 20% and so on up to 70% of buffer full, according to the company.

In addition, a "printer busy" signal is available with selectable positive or negative true logic. This signal can be used to start or stop the external clock signal from the unit.

Split transmit/receive transmission rates can be selected, and the unit will support Bell 103- or 202-type modems with main or secondary channel line protocol.

The unit offers logic-seeking, bidirectional printing, internally controlled by a microprocessor that looks ahead to calculate if the next line should print right-to-left or left-to-right. This feature means leading or trailing blanks are automatically deleted, with 10 or more embedded blanks skipped at high speed.

Three Print Sizes

The unit also features three different program-selectable print sizes including five char./in. for headings or titling, 10 char./in. for normal printing and 16.7 char./in. to put still more information on a single line. The maximum size of paper for the unit is 15.7 in., the company stated.

Line spacing on the unit is also programmably selectable, at one, two, three, four, six, eight or 12 line/in. Forms may be 6-part paper.

A full 128-character Ascii set printed in 7 by 9 dot-matrix characters is standard, a spokesman noted. This is said to allow for true underlining, lowercase descenders and clearly formed characters that allow good readability.

The printer costs $4,025, with quantity discounts available from the company located at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Firm Provides On-Site Service For Disk Packs

LOWELL, Mass. — Scopus Corp. is introducing a disk pack/cartridge preventive maintenance program that is carried out entirely at a customer's installation.

The company said its "total protection plan" provides quarterly inspection and cleaning services. Scopus assumes total responsibility for maintenance, repair, rebuilding or replacement, all at a single, predetermined fee.

Under the plan, the company will measure all physical parameters of disk packs and cartridges, identifying handling damage, wear and scratches. A proprietary disk cleaning machine will be used on-site, the company explained.

The inspection process includes measurement of axial and radial runout, inspection of the trim shield, tightening of trim shelf screws and general inspection of all parts of the pack for multiple-surface packs, the company stated. For single disks, the service includes measurement of the armature plate, disassembly of the cartridge, inspection of plastics and surfaces and other technical measurements.

Most disk pack manufacturers recommend cleaning of packs at least once every six months, preferably once every three months, a spokesman noted.

The service costs $11.50 per unit, with discounts available for quantity orders. Scopus is located at 710 Chelmsford St., Lowell, Mass. 01851.

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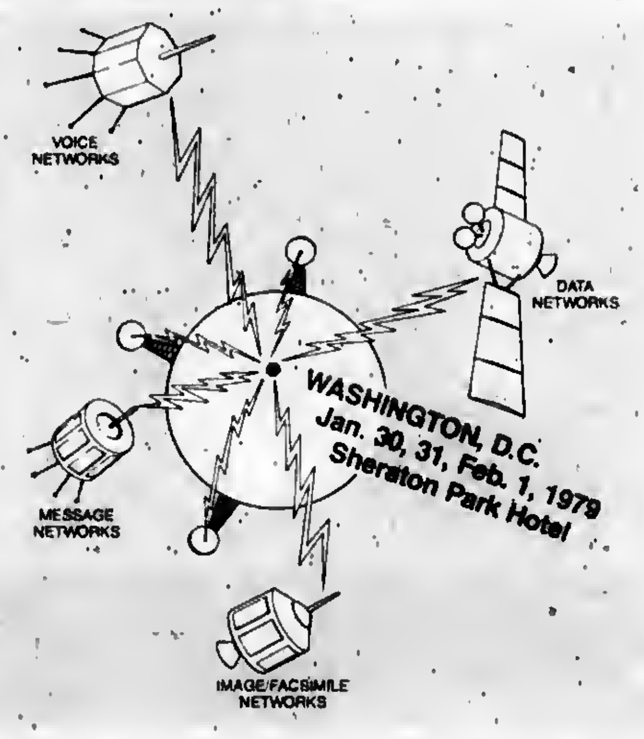

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ECR's Memory Stays Intact Despite Outages

DAYTON, Ohio — NCR Corp. has announced a low-cost electronic cash register (ECR) featuring a memory that retains its contents even when a power outage occurs.

In addition to providing cash-control and transaction-processing capabilities, the NCR 2120 features a non volatile, random-access memory that does not require a battery to protect its contents in the event of any electrical outage.

The Model 2120 keeps track of transactions for up to two cashiers, making it a viable system for many types of food-store operations, an NCR spokesman said. It was also designed for use in shoe stores, drug stores, variety stores, book stores, gift shops and other types of outlets.

The 2120 also features a removable till and two print stations which provide a customer receipt and sales journal. The printers' roller inking mechanism eliminates the need for conventional ink ribbons and the ink roller used with the printer lasts more than five times longer than ribbons, the spokesman stated.

It provides up to 10 department totals, 18 clerk-accountability totals and 12 other transaction totals and generates summary figures, including gross sales, net sales and the amount of cash that should be in the drawer.

The Model 2120 base cost is $1,295.

Dust Covers Custom-Made

AMHERST, N.H. — Cover Craft has introduced a line of vinyl covers for use on terminals and other DP equipment. The covers will help extend the life of the equipment by keeping out dust, the firm claimed.

Hundreds of sizes are available, custom designed to fit virtually all common types of computer room equipment, according to a spokesman. Top price for the covers is $9.95, with three-to four-week delivery, a spokesman said. Cover Craft can be reached through P.O. Box 555, Amherst, N.H. 03031.

Mass Storage System Designed for Cybers

MINNEAPOLIS — Control Data Corp. has introduced a version of its on-line mass storage system (MSS) designed for use by CDC Cyber 170, 70 and 6000 Series users.

The CDC 7880 is a Cyber version of the company's CDC 38500 MSS, intended for use by IBM users. It holds a maximum of 2,000 tape cartridges, for a maximum of 19.6 billion bytes of storage.

Cartridges in the unit can be moved to a read-write position in 3.5- to 5.5 seconds and the information on the cartridges then transferred to a disk.

The unit sells for $362,365 and is available on a one-year lease for $10,032/mo.

Both arrangements include 500 tape cartridges, with additional cartridges available at a cost of $370 for 20.

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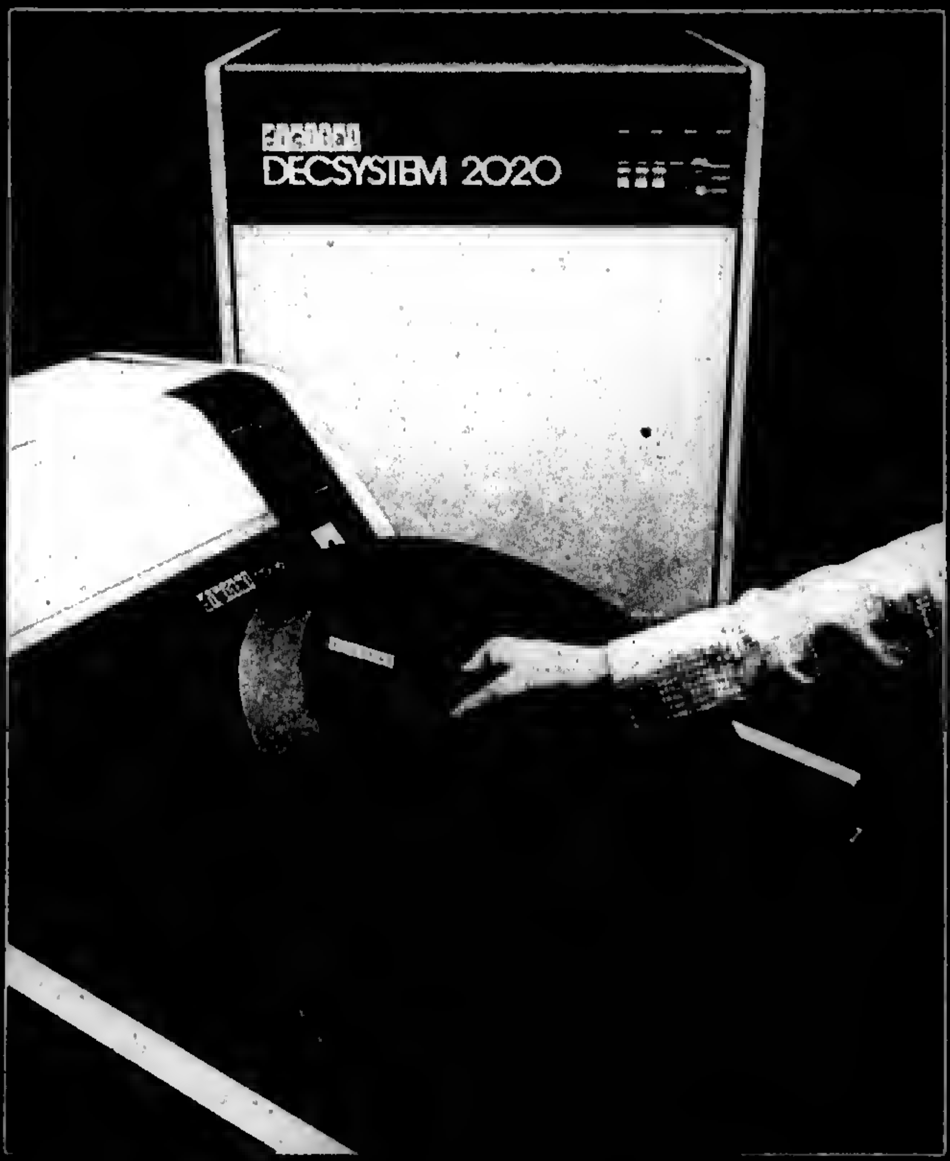

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All DECSYSTEM-20's use the same operating system, languages, application software, user interface, file structure, and data layout. So you can expand your system without re-doing application software, without re-training users, without wasting time and money on system conversion. You never lose your investment in software.

The DECSYSTEM-20 family's incredible software compatibility also makes distributed processing easy. With DECnet communications software, you can set up a network of machines offering a variety of capabilities, all using the same operating system, applications software, and vendor, with central software maintenance. And through 2780 and 3780 interfaces available within the family, you can even communicate with other makes of computer.

In addition, DECSYSTEM-20 family software is fully proven, with over 15 years of development behind it. The TOPS-20 virtual memory operating system supports a full complement of industry-standard high level languages, including the lowest cost full-mainframe, APL on the market. And with their comprehensive system utilities and specially designed interactive architecture, all DECSYSTEM-20's are surprisingly easy to use for both skilled and unskilled operators.

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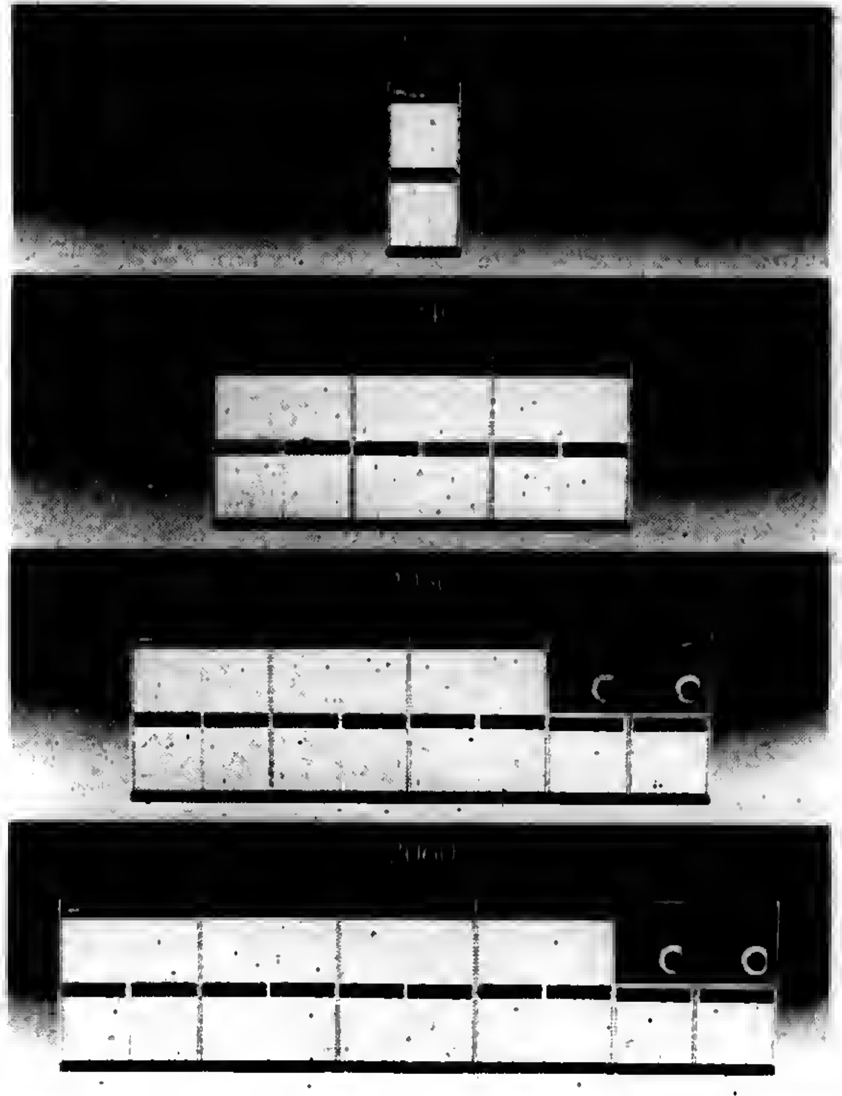

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For Both Purchase and Rental
IBM Cuts Prices on 3344, 3350 Disk Drives

WHITE PLAINS, N.Y. — IBM has quietly announced price cuts on two of its major disk drive systems, the 3344 and 3350. Purchase prices on the equipment were cut 20%, while rental prices were lowered by 10%, according to a spokesman.

The action followed a similar move in Germany, where purchase prices on the equipment were cut by 14% and rental prices, 15%.

Although the IBM spokesman claimed that the price cuts were simply part of a normal business review, financial observers have speculated that the move is intended to push prices downward in order to protect or possibly expand IBM's market share.

Purchase prices for the IBM 3350 disk drives before the cut were $62,500 for the Model A2 and $78,000 for the Model A2F. These prices were cut to $50,000 and $62,400, respectively, in the announcement.

Rental prices on the two storage units were cut from $1,704 (Model A2) and $2,127 (Model A2F) to $1,533 and $1,915,respectively.

Other Cuts

Similarly, purchase prices on the IBM 3344 Model B2 and the Model B2F were cut from $49,500 and $65,000 to $39,600 and $52,000, respectively; rental prices were cut 10%, from $1,351 on the Model B2 and $1,774 on the Model B2F.

Along with this action, IBM announced price cuts of the same order for the 3830 disk controller. The Model 1 will now carry a price tag of $70,340, as opposed to the previous $87,930; the Model 2 will rent for $3,965/mo and will sell for $115,200.

Some industry observers have speculated that the move anticipates the announcement of a new disk drive from the company; however, the IBM spokesman did not provide any details on this.

DP in Insurance Survey Topic

LOUISVILLE, Ky. — A survey of 23 insurance companies, all members of the Americas Univac Users Association (AUUA), showed that 13% of the head-office personnel employed by the companies work in DP.

The survey, conducted by Paul Schladant, director of DP for the Lincoln Income Life Insurance Co. here, revealed that DP salaries in the life insurance industry accounted for approximately 10.2% of all salaries paid by the companies, while DP activities as a percent of total income for the companies amounted to 1.1%.

This contrasts with the finding that an average of 7% of fire and casualty companies' payrolls goes to DP personnel.

The two types of companies compared closely on DP expenses as a percent of premium income, with life insurance companies paying 1.6% (on average) and fire and casualty companies 1.3%.

The ratio of DP costs to premium income for life insurance companies that own their own equipment declined as a function of company size, the survey found, presumably reflecting an economy of scale.

Companies with a premium income ranging up to $20 million spent an average of 1.9% of their income on DP costs, while companies with revenues of more than $100 million paid 1.6% of their income in the DP area. Medium-sized companies, with premium incomes ranging from $20 million up to $100 million, devoted 1.5% of their income to this area, Schladant found.

Status of Data Entry Examined

(Continued from Page 63)

drich continued. "Bearing in mind that the work conditions are much poorer and that incentives rarely exist, this is a surprising situation. However," he added, "the percentage of marginal performers tends to be high."

Points of View

The difference in approach might be a result of looking at the technical aspects of the systems differently. "Punchroom organization is along the same lines as in the West, [but] knowledge of machine capabilities tends to be much greater. In Eastern Europe, users are interested in the system software and application potential of the equipment. Generally, it has been imported for hard currency and represents later technology than that locally available," Aldrich stated.

Elaborating on this theme, he went on to say that Eastern European organizations generally employ skilled computer experts with good theoretical training who are eager for experience with relatively high technology. "They take the view that the data entry system is a minicomputer that runs a data entry application but can be used as a standalone computer — a notion that Western users have recognized of late."

Furthermore, Aldrich said, "Users invariably do their own maintenance. They employ engineers, often of a very high standard, who are trained by the manufacturers for the full range of preventive and remedial maintenance work. Spares are purchased from the manufacturer. User knowledge of the system is thus far from superficial."

One aspect of data entry experience common to the East and the Third World is social pressure, Aldrich indicated. The emphasis in states with entrenched bureaucracies is on reducing paperwork and removing frustration, with computerization of the bureaucracy seen as the second best alternative — the best being the elimination of a bureaucracy.

In the Third World particularly, Aldrich noted, industrialization provides a push toward computerization as an infrastructure develops.

Aldrich concluded that the key distinction is still money. The richer Third World countries have the money to race, but the poorer ones can only watch and wait.

CPU Uptime 'Phenomenal'

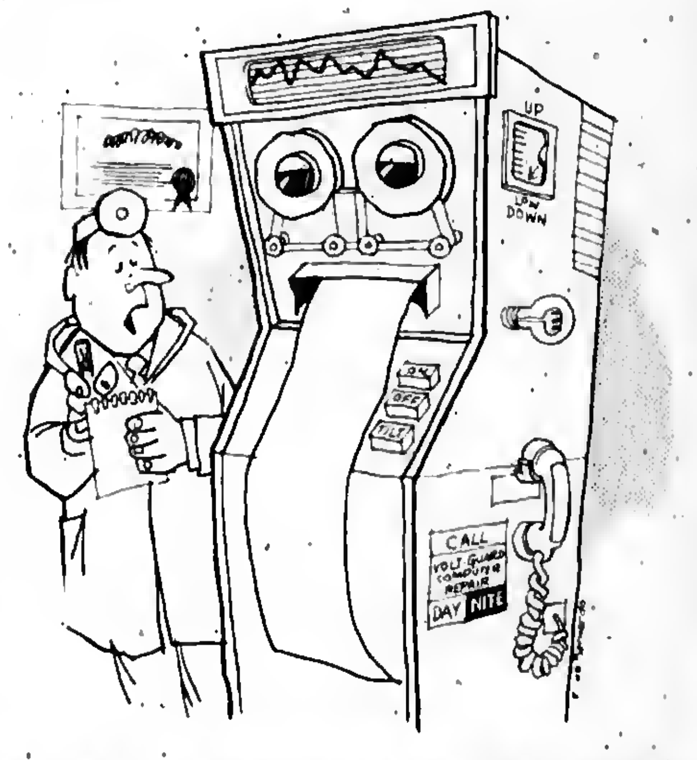
(Continued from Page 63)

ing to the Itel processor, Roberts noted, and still has a good deal of IBM software on the 3M-byte system. "All kinds of business applications," including some teleprocessing, run on the system under SVS, Hasp and IMS. "Itel generally takes care of our software needs; its people are knowledgeable in that area, and we have few needs in the software area. Also, SVS seems to be pretty stable."

Two of the factors that had persuaded the company to buy the Itel unit were price and future expansion.

"I would estimate that our savings over the next couple of years will be more than $1 million," Roberts said. "In addition, we will shortly be upgrading to an Itel 7031. The upgrade is scheduled to be accomplished over a 30-hour period, on-site. We will go down as an AS/5 and come up as the 7031. I like that concept a lot."

The company has done a lot of its own software development, Roberts continued. "We wrote our own data entry system, an on-line terminal system called OTS.



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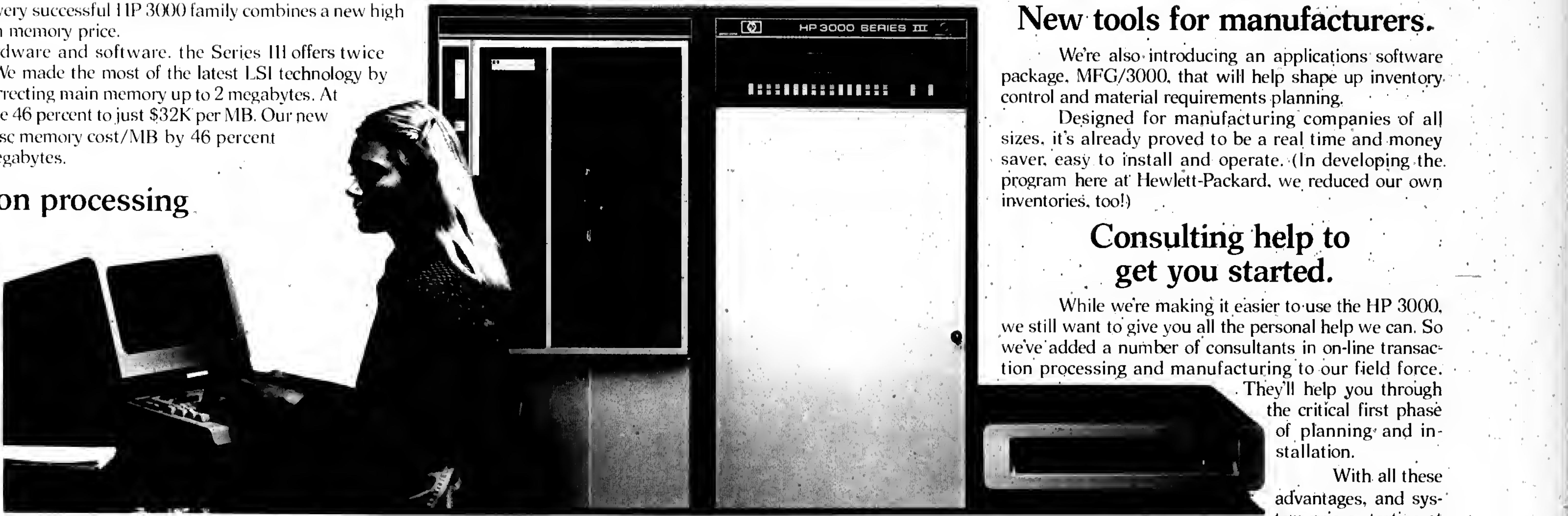

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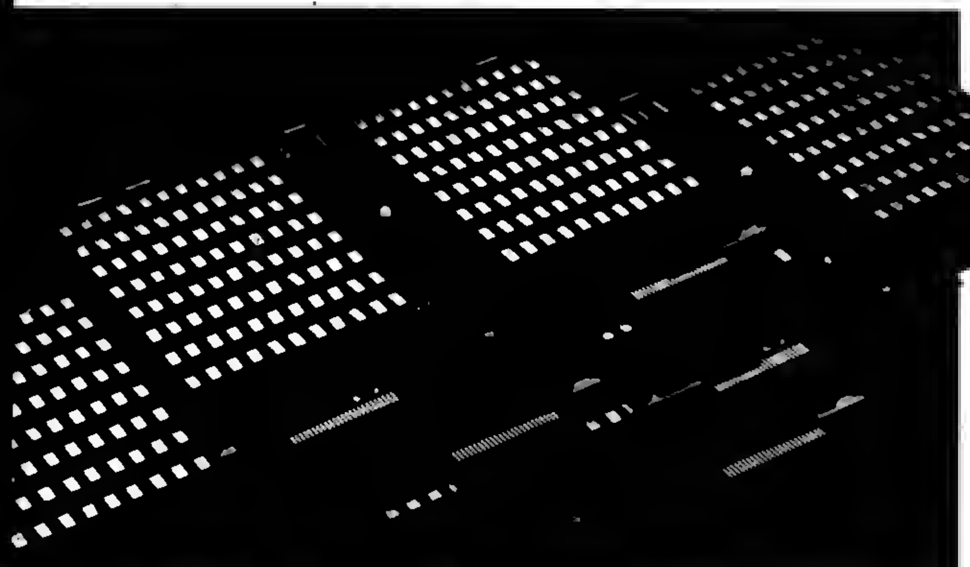

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Adage Adds High-Speed Interactive Displays

BOSTON, Mass. — A series of high-speed, high-resolution interactive graphics display systems that interface to many widely used computers has been introduced by Adage, Inc. The devices are said to free host computers of graphics computational burdens.

The Adage 4100 family features a 56-bit microprogrammed graphics processor with a high-speed control store memory, the company said. The memory is said to permit displays of more than 23,000 dynamic vectors flicker-free, the company continued.

Each member of the family can support up to four fully interactive consoles at direct memory access (DMA) speeds, the company said.

Two two-dimensional models, the 4115 and 4125, and a three-dimensional model, the 4135, contain firmware in read-only control store memory, a spokesman noted; a third, three-dimensional model, the 4145, contains a random-access memory control store that is said to allow users to develop custom applications firmware.

Options on the units include a 128:1 zoom, programmable hardware window, circle arc generator, three-dimensional depth cueing and image buffer up to 128K bytes. Display console options include an alphanumeric keyboard; 32 programmable, lighted function switches; light pen; joy stick; data tablet; and color monitor.

Prices on the devices range from $44,170 for the 4115 to $57,570 for the three-dimensional 4145. Windowing, circle/arc generators, additional buffer memory and other features are extra, the company stated.

Two other graphics terminals in the series, the models 4370 and 4250, were designed particularly for IBM systems, the company said.

Both attach to a standard IBM 360/370 selector, byte multiplexer or block multiplexer channel, and can be located up to three miles from a host via RG-11U coaxial cable pairs. In addition, both are microprogrammed, feature a local refresh buffer memory, can generate 95 Ascii plus 27 special characters and feature up to 240 character sizes.

In addition, both are said to feature a microprogrammed graphics processor with a cycle time of 200 nsec and a microinstruction word length of 56 bits.

The 4370 can display three-dimensional images and support up to 16 display stations on a single channel, while the 4250 supports a maximum of 12 stations. Both have options similar to the ones on the 4100 family, a spokesman noted.

Minimum configuration for the 4250 includes 4201 control unit, priced at $36,000, and a 4250 control station, with one CRT station, for $44,000. A second CRT station can be added for $17,500, and a third for $20,500, a spokesman explained.

A 4201 control unit is also needed to use the 4370. Its price begins at $56,000. Additional CRT stations on the 4370 also cost $17,500, the spokesman added from 1079 Commonwealth Ave., Boston, Mass. 02215.

Kodak Enhances COM Offerings

ROCHESTER, N.Y. — Eastman Kodak Co. has announced several hardware and software enhancements to its line of computer output microfilm (COM) equipment that it says make the equipment faster and more cost-effective.

The company's Komstar 300 and Komstar 200 microimage processors (COM units) have been modified to permit each to operate in either on-line or off-line mode, thus making them, in effect, identical units. Previously, the Model 300 operated off-line only and the Komstar 200 operated only in on-line mode.

A $1,300 hardware modification is available for either unit, the company said.

In addition, Komstar 200 users, who previously operated only on-line, must purchase the company's read-only tape drive for operating off-line. The unit is compatible only with IBM systems in on-line mode and looks to that system like a 3211 or 1403 printer, the company noted.

Another enhancement to that system permits the use of non-Ebcdic-format (non-IBM) tapes, as well as IBM format. However, users of the system must still use Kodak's tape drive for input. The $4,125 modification requires very few software changes, the company noted, while still maintaining original equipment speeds.

A third hardware enhancement, a 125 kHz data transfer rate crystal, is said to increase throughput by 10% to 15%. No software modification is necessary for the $100 improvement, the company said, adding that this enhancement, as well as the other two hardware improvements, are all retrofittable in the field.

A software enhancement to the company's Parameter Management Executive Software will permit users to put job parameters on the beginning of a tape, to be read and acted on by the COM unit. This feature, available free, will help cut down set-up time on the unit, the company stated.

The software enhancement is available now, the company indicated, while the three hardware improvements will be available in the first quarter of 1979.

Kodak can be reached at 343 State St., Rochester, N.Y. 14650.

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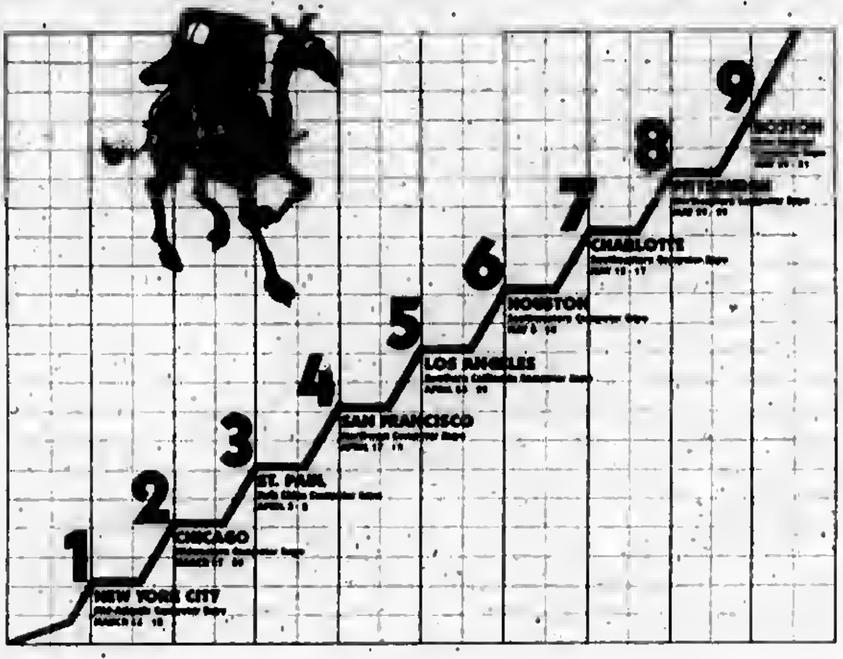

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Firm Boosts Capacity 20% With Add-On

LOUISVILLE, Ky. — Brown and Williamson Tobacco Corp., the nation's third largest tobacco company, has increased its DP throughput by an estimated 20%, giving the firm more computer capability to keep tabs on marketing of its cigarettes.

The company accomplished this by doubling the main memory on its IBM 370/158 from 1-to 2M bytes with a Memorex 6358 add-on memory system. This has allowed the mainframe, formerly at 100% capacity, to incorporate an extensive Interactive Query Report Processor (IQRP) containing a retail distribution data base. Distribution and volume data for some 390,000 stores and outlets are detailed in the file.

"Before the memory was added, our first shift was experiencing long delays in job execution. We had about 40 systems engineers using Roscoe (a software RJE-type package used for conversational interactive program development) and the system was overloaded. The add-on did exactly what it was supposed to do," Ron Gossman, operations manager, remarked.

Paging Rate Lowered

Without the add-on, he explained, the paging rate on the virtual storage operating system was reaching 20 page/sec; with the memory it was reduced to less than one page/sec. Actually, only .5M byte was needed to solve the contention problem. The other .5M byte will permit future expansion.

"Lowering the paging rate has allowed jobs to run faster. We can now meet a much greater demand for computer services," Gossman noted.

"We realized our problem was not with the CPU, but with the throughput; it was blocked by paging. For example, jobs with lower priority would deactivate as the CPU became busier. Some jobs were just not getting done because the system was always above the threshold for performing the lowest priority work," Gossman observed.

The company, a subsidiary of Brown and Williamson Industries, which, in turn, is part of British American Tobacco Ltd., operates under VS/1 and utilizes the Customer Information Control System (Cics) package.

The IQRP on-line system which includes such information as store volumes, contracts for special displays, brand distribution to stores, and address data is used by sales managers to measure market penetrations of the company's cigarette products. It also is used to study the effectiveness of displays in the outlets and to compare sales volumes.

The firm's 800 sales staff members update the file quarterly by filling out optical scan forms that are transferred to tape for entry into the data base.

Full Range of Functions

In addition to the IQRP system, the DP facility also provides the full range of on-line business functions, including general ledger accounting, accounts payable and purchasing. In a batch mode, usually at night, the system processes payroll and inventories for finished goods and spare parts for manufacturing machinery. In all, there are more than 70 applications now running on the computer here.

The facility also uses a tobacco leaf marketing system to keep track of the movement of about 250,000 hogsheads of tobacco leaf as it leaves the farmer to be auctioned, purchased, delivered and stored in the warehouse.

In selecting the add-on, Brown and Williamson initially studied the available equipment from five major vendors. This was quickly reduced to two competing vendors based on price/-performance.

"Two factors swung us to Memorex. First, we already had the Memorex 1270 controllers and were satisfied with their performance and service. Second, the Memorex add-on uses 8K chips; since only half as many need be used; greater reliability can be achieved," Gossman explained.

"Other contributing factors were the 'dial-out' feature that permits complete electrical removal of the add-on from the system with one switch and the short delivery time Memorex offered."

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To Boost Throughput

CPU Distributes Computing Internally

By Jeffry Beeler
CW Staff

ELMSFORD, N.Y. — Rather than disperse its computing power geographically in the classical sense of distributed processing, a high-end addition to Mini-Computer Systems, Inc.'s Micos computer line reportedly distributes its functions internally to achieve an undisclosed increase in system throughput.

Described as a "supermini" system suited primary for Fortune 1,000 firms, the Micos 300 removes all application program execution, terminal-related processing and arithmetic operations from its host CPU and assigns these functions to several smaller, subsidiary processors. A recently introduced decimal arithmetic processor, for example, relieves the host of all arithmetic operations, while another auxiliary processor assumes the burden for all application programs and terminal-related functions, according to a spokesman for the firm.

By applying distributed processing principles to the Micos 300's internal design, the firm has speeded its latest offering's CPU operations, although the spokeswoman said the increase in throughput varies too much with the application to cite typical figures.

Faster File Operations

The company has also speeded the Micos 300's file operations by quadrupling its disk-sector size from 512 bytes to 2K bytes, the spokeswoman added. Mini-Computer Systems attributed the faster file operations, which are also said to be too applications-dependent to quantify in general, to the system's 300M-byte disk unit, reportedly the largest mass storage system in the supermini product class.

In related announcements, the firm also introduced several other products, all intended to operate with its top-of-the-line Micos system. These additional offerings include an asynchronous communications controller, the decimal arithmetic processor, a 32M-byte disk unit and a microprocessor-based dual printer controller.

Mini-Computer Systems' Micos 300 supermini boosts throughput by distributing host CPU functions to built-in, auxiliary processors.

With the introduction of the Micos 300, Mini-Computer Systems has expanded its business systems line to three models. The other two, smaller members of that family include the Micos 100, which incorporates a CPU with four chassis slots and 10M- or 32M-byte disk systems, and the Micos 200, a 12-slot configuration with 32M- or 80M-byte disk units.

All three systems are compatible in hardware, operating system and application software, the spokeswoman said. Thus, users can expand a Micos 100 or 200 to a Micos 300 without having to recompile their programs or data files.

In PDP-11/70 Class

Said to belong in the same product class as the Data General

(Continued on Page 84)

Replacement Parts Dealer Gains By Scrapping System and Vendor

By Marguerite Zientara
CW Staff

CHICAGO — A supplier of one type of replacement equipment became a customer for another type when it discovered several years ago that it would have to dump not just its minicomputer system but the vendor of that system as well.

For years, the Harry Alter Co. had operated an IBM 1130 that had always proved adequate for the firm's DP needs. But as Alter's refrigeration replacement parts business expanded, the company gradually outgrew the 1130's capabilities. In the years since Alter had acquired the 1130, IBM had not enhanced the system to keep pace with the user's growing needs.

Realizing it had reached a dead end with IBM's existing product line, the parts supplier reluctantly resigned itself to searching for both a new system and a new vendor. Unfortunately for the user, a full-scale hardware conversion almost certainly meant an equally extensive — and possibly even more costly — software conversion.

In the end, however, Alter made the necessary hardware switch and at the same time preserved its existing applications software by replacing its 1130 with a Digi-

(Continued on Page 78)

Controller Links LSI-11s To Eight 3M Tape Systems

ANAHEIM, Calif. — 3M-type tape cartridge units can now link to Digital Equipment Corp. LSI-11 microcomputers with a plug-in cartridge tape controller from Western Peripherals.

The TC-160 reportedly accepts one to eight 6,400 bit/in. tape systems with 17M bytes each or the same number of 1,600 bit/in. units, each storing up to 4.2M bytes.

By emulating the DEC TM-11/TU-10 half-inch tape system, the controller performs applications that formerly only big-reel tape units could accommodate, according to a Western Peripherals spokesman. With the TC-160, 6,400 bit/in. tape units can serve as backup for Winchester-type disk systems.

In general, the controller suits applications requiring ease of tape handling plus minimal cartridge system size and weight, the spokesman explained.

Requiring no special wiring, the controller occupies any two adjacent Q-bus slots and connects to a small adapter board that mounts on a tape unit's rear.

The adapter board allows the controller to interface cartridge units from DEI Teleproducts, Inc., Kennedy Co., Qantex, Tandberg Data, Inc. and 3M Co. It also daisy-chains the units, performs unit-select assignments and provides signals to front-panel Ready, Select, File Protect and other indicators, the source said.

Available separately or as part of a TC-160 cartridge tape subsystem, the controller costs $2,500 and can be obtained from Western Peripherals at 1100 Claudina Place, Anaheim, Calif. 92805.

Event Will Stress Trends In Small CPU Technology

SAN FRANCISCO — Users, DP managers and other computer professionals can reportedly learn about the latest minicomputer technology and applications at a small computing systems conference and exhibition scheduled to take place here at the Sheraton Palace Hotel on Dec. 4-6.

Sponsored by the American Institute of Industrial Engineers (AIIE), the event will cover such topics as the impact of IBM's entry into the small computing field, industry trends and implementation and management issues, including a discussion of how to install an effective system and overcome technical problems.

On Dec. 5, the conference will feature two sets of three concurrent panel sessions, one in the morning and one in the afternoon. The morning sessions will cover financial applications; engineering, scientific and academic applications; and small systems evaluation and selection. The afternoon sessions will cover administrative applications; manufacturing, distribution and plant applications; and communications and small systems networks.

The last two days of the conference will coincide with a product exhibit featuring the latest small business computers, microcomputer systems, programmable calculators and computer services.

A $295 registration fee for AIIE members and $330 for nonmembers covers the cost of luncheons and all seminar materials. Contact AIIE Seminars, Department PR, Box 3727, Santa Monica, Calif. 90403.

Nixdorf Offers Self-Adjusting Turnkey System

By Brad Schultz
CW Staff

CHICAGO — The U.S. small to medium-size business user has been offered a turnkey system that reportedly needs no programmer or systems analyst to fit changing environments.

Already running at some 500 foreign sites, the Nixdorf Computer Corp. Versatile Processor (VP) is aimed at distribution management and financial control applications.

Presented at last week's Information Management Exposition & Conference here, the VP combines Nixdorf's Model 8870/1 CPU and Comet operating system. It presently accommodates up to eight intelligent CRT terminals, allowing independent execution of programs at each workstation, Nixdorf said.

The system will eventually handle up to 16 terminals and communicate with most mainframe types via firmware emulation, according to a spokesman.

The user can avoid costly, time-consuming programming in implementing the system, Nixdorf claimed. The user completes a survey of I/O and processing requirements; based on an analysis of these needs, the system "decides" which functions will be provided.

By submitting surveys as needed, the VP can adapt to changing environments "automatically," the vendor said.

The self-adjusting capability was called an alternative to two conventional approaches to customization: "canned" software packages that require extensive modification and the development of personalized software by in-house or contracted systems analysts.

Software Modules

Comet forms the essence of the turnkey package. Written in 3 million bytes of code, it offers inventory control, order processing and invoicing and financial accounting modules.

Altogether, these modules reduce inventory investment, increase customer service levels, accommodate complex prices and discounts, accelerate the collection of outstanding receivables, maintain audit trails, reduce the order-to-shipment cycle, monitor sales performance and identify obsolete and slow-moving stock, the spokesman said.

System security features include a multiple password scheme by which certain programs can be restricted and a hierarchy of privilege levels. The system automatically reverts to battery power if normal power fails.

The system hardware is available in six "entry-level" configurations, according to Nixdorf. The low end is the Model 8870/1A with 64K bytes of main memory, 6M bytes of disk storage, a CRT terminal with an 8080-type microprocessor and a 165 char./sec serial printer. Its purchase price is $29,500; monthly maintenance costs $250.

The top of the VP line is the Model 8870/1F with 64K bytes of main memory, an extra 64K bytes of memory, four CRT terminals, 66M bytes of disk and a 300 line/min printer. It costs $88,400 and carries a maintenance tag of $588.

Options include disk storage ranging to an extra 66M bytes for $43,600 including controller and a programmable line controller with IBM 2780/3780 binary synchronous communications protocol for $3,500.

Depending on type, each Comet module costs $1,500 to $4,500; all can be bought for $12,000. Supporting Comet, the Nixdorf Integrated Real-Time Operating System and Terminal Automatic Monitoring System — mandatory for all configurations — together carry a monthly license cost of $50.

Dealer Scraps System and Gains

(Continued from Page 77)

tal Scientific Corp. Meta 4 minicomputer system.

Not only does the replacement system use all the same programs — without modifications — as the 1130, but it also executes those programs several times faster than its IBM predecessor, president Jim Alter said.

Like the 32K-byte 1130, the Meta 4 controls Alter's cornerstone application, an integrated accounts receivable and inventory program that each year deals with 25,000 open accounts, 14,000 assorted inventory items from 300 vendors and 200,000 invoices, each with an average of 3-1/2 lines, Carl Lidd, Alter's DP manager explained.

Constant Updates

Because inventory prices and quantities are constantly changing, the company must continually update its files to ensure that its purchasing agents, inside sales clerks, counter personnel and warehouse workers get the most current information possible.

In addition, the system must monitor inventory status at Alter's four regional supply centers and perform all the administrative processing for the home office and 64 warehouses scattered from Texas to New York, Lidd said.

Because Jim Alter attributes the firm's success to "the best inventory control in the industry," any decisions regarding its DP were bound to affect the entire company's performance.

In searching for equipment that could accommodate the firm's complex applications, Lidd considered General Automation, Inc.'s 1830 as well as equipment from Chi Corp. But Digital Scientific's Meta 4 provided better performance, lower price and better local maintenance, Lidd concluded.

In addition, Digital Scientific offered a choice between renting and purchasing — another factor in the Meta 4's favor. "The other two [vendors offered] a five-year buy-out type of arrangement," Lidd said.

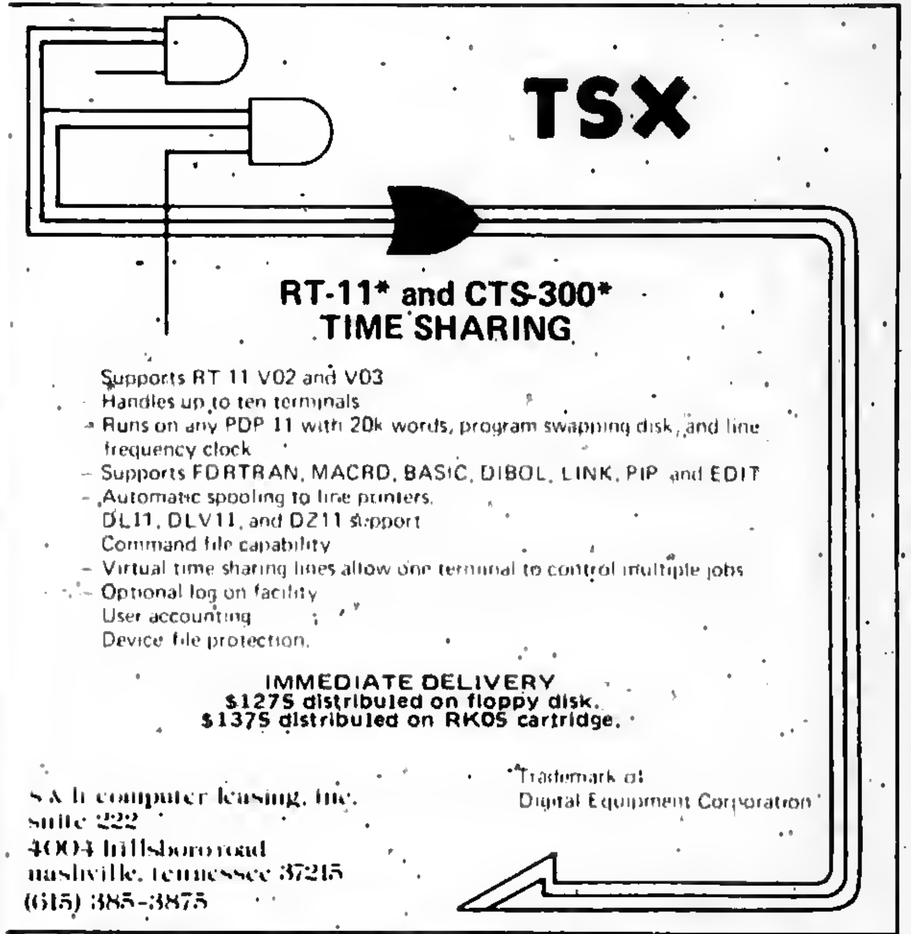
Impressed with these benefits, Alter began leasing the system in October 1974 and finally bought it last year.

Since the system's installation, the company has experienced almost no software conversion problems. "We just took our programs off the old computer, put them on the new computer and they were up and running," Lidd noted. That process took about two weeks, he said, because the firm uses "in the neighborhood of 800" programs.

In addition to a 32K-byte CPU, the Meta 4 incorporates two 200M-byte Memorex Corp. disk units, two 75 in./sec Digital Scientific Model 3416 tape units, a 600 card/min card reader, two 300 line/min Digital Scientific Model 3484 printers and 11 Lear-Siegler, Inc. ADM-3A CRT terminals.

The system uses a "time-slicing" method whereby necessary amounts of processor time are allocated to each of 16 asynchronous, multi-drop communications lines. "I can override normal slicing and allocate more time for central site processing when I have high priority work," Lidd said.

Among its other benefits, the system requires no communications front-end processor. Instead, the Meta 4 mini services all its terminals itself.



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Relieves Overworked Staff

Desktop System Speeds Credit Union Reports

By Marguerite Zientara
CW Staff

RALEIGH, N.C. — Financial accounting and reporting tasks that used to take a local credit union 12 hours to perform manually now require only five minutes with the company's recently installed desktop computer system.

Last year, the Rockwell Federal Credit Union, part of Rockwell International, Inc.'s Flow Control Division Plant here, had an overworked volunteer treasurer and a budget that allowed for only one part-time employee.

Computerization was necessary, according to Bill Mashburn, vice-president of systems and security, but the credit union couldn't afford a large computer or even a minicomputer.

Time-Sharing Drawbacks

Rockwell's time-sharing system was available only at inconvenient hours, and contracting with an outside time-sharing service proved too expensive, Mashburn said.

"It would have cost more than $100/mo to do just a small amount of work at an outside time-sharing service," Mashburn observed. "And sending all our paperwork out was just too much hassle for volunteer labor."

So Mashburn considered replacing the credit union's manual accounting system with Burroughs Corp. and Olivetti Corp. accounting machines, but those alternatives "just didn't fit our applications and they were too expensive besides," he said.

Mashburn also considered Imsai Manufacturing Corp. equipment as well as a Hewlett-Packard Co. 9825 system. "The HP 9825 was really a good machine, but the price was about $13,000 at that time," Mashburn noted. "It really didn't have the capacity I have now either, just a cassette tape. And our Lear-Siegler ADM-3 CRT display is much better.

"Finally I began calling computer clubs all over the country and asked a lot of questions about which systems were best," Mashburn said. A number of people mentioned the Mits/Altair 8800A system from Pertec Computer Corp.

"I got recommendations for it from people in California, Florida and Virginia who had already tried it out," he said, even though that type of system was a new idea at the time.

"All the people I talked to seemed to say the Altair gave the most for the least money and that I could build one myself from a kit, so I called them up," he explained.

Taking the Plunge

Even though Mashburn knew very little about computers at the time, he took the plunge, ordered a system and installed it at the beginning of the year. The system cost $7,000, amortized over three years, or "a little less than $10 per member," Mashburn noted.

The credit union's system consists of a 32K-byte Mits/Altair 8800A processor, a 350K-byte disk drive system, a Lear-Siegler, Inc. ADM-3 CRT and a 60-char./sec Centronics Data Computer Corp. 701 printer.

Mashburn, who has a background in electronics, said he had no problem assembling the kit, except that he missed a couple of solder joints. "With about 4,000 solder joints, it's easy to miss one or two," he explained.

(Continued on Page 82)

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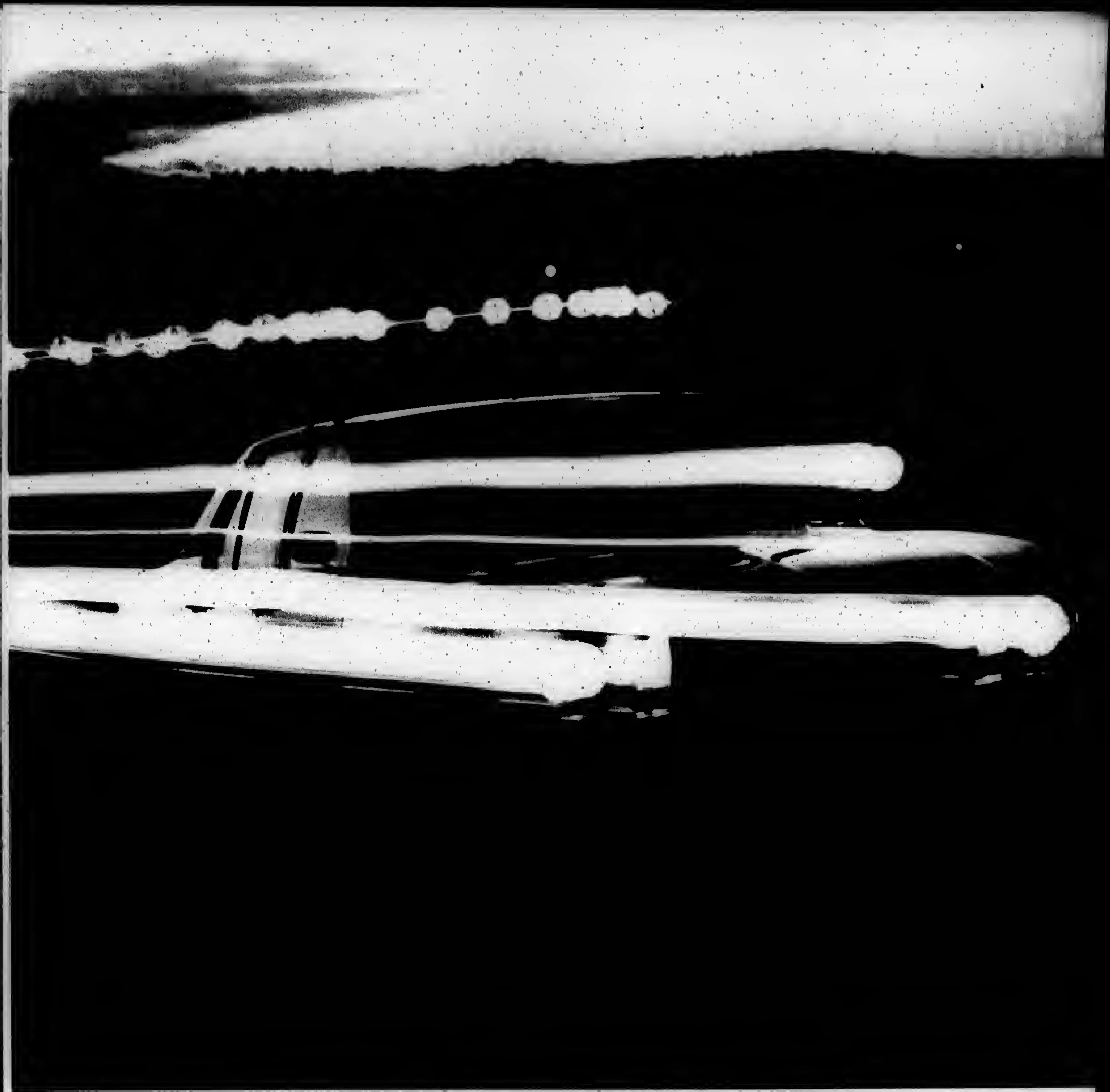

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Printer Yields Three Output Types

SANTA CLARA, Calif. — Three forms of output — computer graphics, printouts and hard-copy duplicates of CRT-displayed data — are all produced by a Versatec printer-plotter subsystem that reportedly generates a page of information for about two cents.

In one mode, the 1641 hard-copy system is said to output hard copy from up to eight CRT terminals in 10 sec. As a printout producer, by contrast, the unit replaces line printers or pen plotters and outputs 1,000 line/min. from most popular CPUs, according to a Versatec spokesman.

As a computer graphics unit, the 1641 plots 1 in./sec to yield 6 pages/min.

Versatec credits the system with accommodating 65 CRT terminal models representing 19 vendors, including Data General Corp., Digital Equipment Corp., Hewlett-Packard Co.; Honeywell, Inc., Tektronix, Inc. and Univac. In fact, the product operates with any digital video source supplying EIA composite video and meeting EIA standards RS-170, RS-330, RS-343A, RS-375A or RS-412A, the spokesman said.

Other Characteristics

Among its other features, the hard-copy system reportedly provides 4-to 2,000 raster line frame, 8- to 1,600 video elements/raster line, horizontal and vertical margins, interlace or repeat field and refresh rates ranging from 15-to 150 Hz.

When providing output from a CPU, the 1641 operates up to 1,000 ft away; when providing output from a video source, 300 ft away.

Measuring 23 in. wide by 18 in. deep by 38 in. high, the hardcopy system costs $11,000 and is available from Versatec at 2805 Bowers Ave., Santa Clara, Calif. 95051.

Controller Holds Four Disk Units

PHOENIX — Up to four disk cartridge units, each with 2.5M to 24M bytes per drive, can reportedly be supported by a Data General Corp. CPU-compatible controller from Konan Corp.

Packaged on one 15 in. by 15 in. board, the K-204B costs $1,176 and is available from Konan at 1434 N. 27th Ave., Phoenix, Ariz. 85009.

Credit Union Speeds Jobs

(Continued from Page 79)

"I would rate the kit second only to the Heath Kits in ease of assembly," Mashburn remarked. "With Heath Kit you don't have to know anything about electronics — if you can solder and read, you can put one together."

Mashburn did not have such kind words for Lear-Siegler's ADM-3 kit, however. "The worst on my list that I have ever seen is that ADM-3," he said. "They just threw a bunch of parts in a box and expect you to put it together."

But the real problem came in debugging the software, Mashburn noted, because his training in that area consisted only of an undergraduate course in Fortran. "It gave me a few headaches," he said, although Pertec and the store where he bought the kit were helpful.

Mashburn needed about 100 hours to write the system's six programs — an undertaking he considered a "learning experience,"

In operation, the system's disk storage unit is initially loaded with the data from all member accounts. At the end of each working day — the credit union is open twice a week — the office manager keys in all the day's transactions to update the disk.

"After working through the day's transactions, balancing and checking for errors," the manager then has the computer print out a 'working sheet' for use during the next day's business," Mashburn said.

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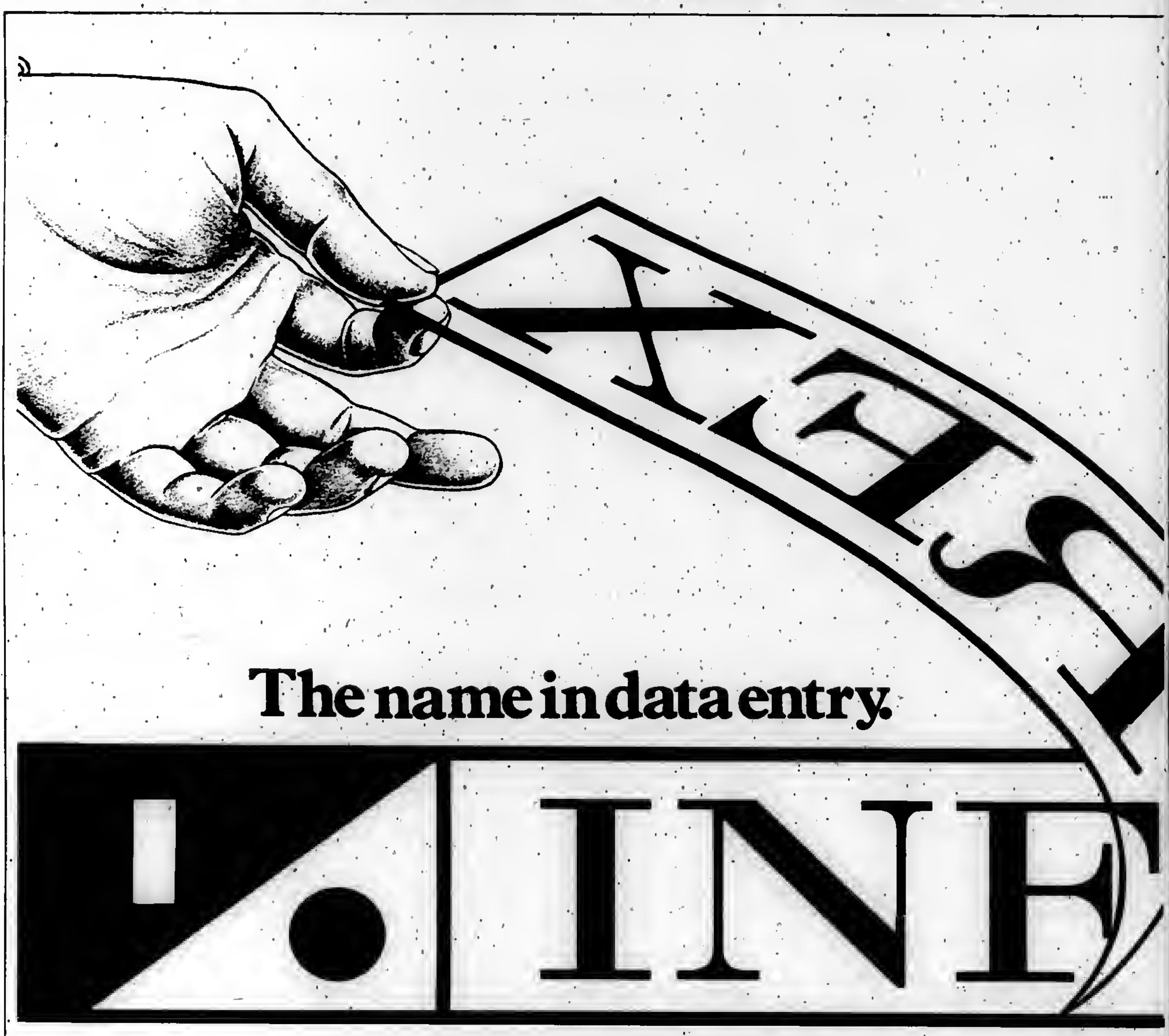
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Disk Unit Stores 40M

CHATSWORTH, Calif. — Users of business microcomputers can store up to 40M bytes with a hard disk subsystem that reportedly operates 15 times faster than its floppy disk counterparts.

Pertec Computer Corp.'s Icom 4511 incorporates a microprocessor-based controller that is said to support up to four 10M-byte Pertec D3000 hard disk drives, each with 5M bytes of fixed and 5M bytes of removable storage.

Equipped with slide mounts for 19 in. racks, the subsystem transfers data at 5 Mhz and incorporates 2,200 bit/in. storage media that rotate at 2,400 rev/min.

An S-100 version of the Icom 4511 costs about $9,000 and becomes available this month from Pertec at 20630 Nordhoff St., Chatsworth, Calif. 91311.

Micro Simplifies Lab Interfacing

MAYNARD, Mass. — Researchers who lack computer expertise can reportedly develop application programs and interface laboratory instruments with minimal trouble by using a modular microcomputer system from Digital Equipment Corp.

A spokesman for the minicomputer manufacturer attributed the simplified program development to the Minc system's software — Minc Basic, an extension of PDP-11 Basic. With Minc Basic, users can transfer files between disk systems and issue other commands to mass storage units.

'Connector Blocks'

To ease connection of laboratory instruments DEC has equipped Minc with "connector blocks" that detach from the system while remaining linked to the instruments.

Mounted on a portable, cart-like cabinet, the system reportedly performs scientific and engineering computations, collects laboratory data and controls lab instruments as well as performing general DP jobs.

The system's IEEE-488 interface supports up to 14 laboratory instruments and testing devices. Its chassis accommodates as many as eight hardware modules that users can mix in any combination to produce a custom-built lab configuration, the spokesman reported.

Choice of Modules

DEC offers Minc with a choice of seven types of modules — A/D converters, D/A converters, digital input units, digital output units, multiplexers, preamplifiers and programmable clocks.

The system's other hardware modules include DEC's RX02 double-density dual diskette unit, VT105 graphic terminal and a 30K-word PDP-11/03 with three serial-line channels plus extended and floating-point instruction sets. The terminal displays upper-and lowercase alphanumerics as well as generating graphics and histograms.

Among its other software, the system provides DEC's RT-11 Fortran IV, an implementation of Ansi-1966 Fortran IV.

Minc's prices start at $12,500, and deliveries of the system will begin this December from DEC at 146 Main St., Maynard, Mass. 01754.

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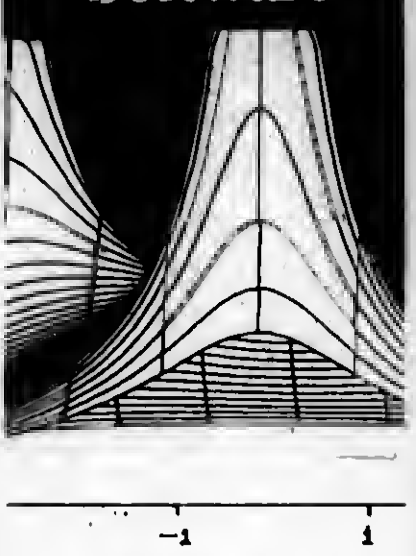

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Disk Controller Suits DG CPUs

PALO ALTO, Calif. – Any Data General Corp. or DG-compatible CPU can support up to 600M bytes with a single-board disk system controller that is said to cost 40% less than comparable products.

Minicomputer Technology, Inc.'s SMC902 supports one or two Storage-Module-type disk units from Ampex Corp., California Computer Products, Inc., Control Data Corp., Kennedy Co., Memorex Corp., Microdata Corp. or Okidata Corp., according to a Minicomputer Technology spokesman. The controller also supports three operating systems – Data General Corp.'s Rdos, Educational Data Systems, Inc.'s Iris and Information Processing, Inc.'s Blis/Cobol.

Because of its single-board design, the unit, which draws 4.2A at +5V and 0.5A at -5V, reportedly requires no extra fans, power supplies, multiboard interconnections or cabinetry.

In addition, the SMC902 supports APL, including automatic seek to cylinder zero.

An on-board random access memory buffer makes the controller independent of CPU data channel bandwidth restrictions, the spokesman added.

With flat cabling to the first drive and a one-year warranty, the SMC902 costs $2,750 and is available from Minicomputer Technology at 2470 Embarcadero Way, Palo Alto, Calif. 94303.

Micos CPU Distributes Its Processing Internally

(Continued from Page 77)

Corp. M/600, Digital Equipment Corp. PDP-11/70 and Hewlett-Packard Co. 3000 series, the Mini-Computer Systems Micos 300 incorporates two DG Nova 3/12s, one as a host and the other as an I/O processor.

In its 12 CPU chassis slots, the host houses modules like the decimal arithmetic processor, the auxiliary processor for terminal-related processing and application program execution, and a minimum main memory of 8K bytes expandable in 32K-byte increments to 256K bytes. The I/O processor also incorporates 12 chassis slots and houses the controllers for the Micos 300's disk units, printers, magnetic tape units and all other peripherals except CRT terminals.

In addition to the two main CPUs and their subsidiary processors, the system supports microprocessor-based eight-port multiplexers, as many as four 32M-, 80M- or 300M-byte disk units, up to 300 line/min or 600 line/-min printers, a system console and a practical maximum of 24 CRT terminals. Mini-Computer Systems recommends users allot 8K bytes of main memory for each terminal, the spokeswoman noted.

Of each 300M-byte disk unit's total capacity, users can address 256M bytes for a combined mass storage of up to 1G byte. The 300M-byte disk system operates only with the Micos 300, not with its two smaller Micos relatives, the spokeswoman added.

Typical Configuration

A typical Micos 300 configuration consists of a 96K- to 128K-byte host processor, an I/O processor, two 300M-byte disk units, one 600 line/-min printer and 12 to 16 terminals.

Software available with the system includes the Micos operating system, Basic and the Minicomputer Accounting Package System, a library of application programs for standard business functions like payroll, accounts receivable, accounts payable and general ledger. The system also provides a family of "industry-oriented" application packages for wholesale distribution, word processing and information retrieval.

With first shipments slated for next January, the Micos 300 ranges in cost from $140,000 to $200,000.

Occupying one board slot in the host's chassis, the controller incorporates an Intel Corp. 8085 microprocessor, a 2K-byte read-only memory (ROM) for program storage, a 2K-byte random-access memory (RAM) for working storage, an I/O bus interface and eight 9,600 bit/sec asynchronous line interfaces.

Operates With Any Micos

Like the asynchronous communications controller, the decimal arithmetic processor operates with any of the three Micos systems. In addition to performing basic arithmetic operations, the processor provides I/O conversions and data reformatting, the company officials said.

Microcoded with 8K bytes of programmable ROM, the processor is said to incorporate an arithmetic logic unit, a 128K-byte RAM for working storage, an I/O bus interface and operating system software.

The 32M-byte disk unit, meanwhile, provides 16M bytes of fixed and 16M bytes of removable storage for either the Micos 300 or the Micos 100. Capable of transferring 1.3 million bit/sec, the disk system provides a 28-msec average access and a 7-msec track-to-track access, Mini-Computer Systems noted.

The asynchronous communications controller costs $7,500; the decimal arithmetic processor, $5,500; the 32M-byte disk unit, $12,000; and the dual printer controller, $2,000.

Mini-Computer Systems is located at 525 Executive Blvd., Elmsford, N.Y. 10523.

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Micro Chips

One-Board System Bows From Ohio Scientific

AURORA, Ohio — Superboard II has been introduced by Ohio Scientific, Inc., which claimed it is the first microcomputer system to be contained entirely on only one board.

The single board was accomplished by using custom state-of-the-art LSI micro circuits, the firm said.

Other features include 8K of Basic in read-only memory (ROM), up to 8K of static random-access memory (RAM), a 6502 microprocessor, a full 53-key keyboard, a CRT and a Kansas City-standard audio cassette interface, plus full machine code monitor and I/O utilities in ROM.

Options include an expander board with 24K of additional static RAM, a dual minifloppy interface port adapter for a printer and modem and an Ohio Scientific 48-line expansion interface.

The Superboard II costs $279 from Ohio Scientific, 1333 Chillicothe Road, Aurora, Ohio 44202.

Disk Software Runs on 8080

W. LAFAYETTE, Ind. — The TSC text editing system, TSC text processing system and TSC mnemonic assembler have been introduced by Technical Systems Consultants, Inc. and were designed to operate under the CP/M disk operating system.

These 8080 assembly language programs include a fully annotated printed source listing, the firm said. The editor is line-and content-oriented and commands may be used in a string, line, relative, local or global sense. Features include block move and copy, tabs, overlays, append and restrictive column searches. In addition, any file will fit regardless of random-access memory space available, it added.

The text processor is an extensive output formatter that processes any number of named edit files.

The Assembler is Intel Corp.-compatible except for macros, conditional assembly and logical expression operators, the firm said.

The programs come with a user's manual, printed source listing and 8-in. CP/M-compatible disk. The text editing system costs $40, the text processing system $50 and the mnemonic assembler $40 from Technical Systems Consultants,. Inc., P.O. Box 2574, W. Lafayette, Ind. 47906.

Micro-Based Unit

Weather Station Debuts

BENTON HARBOR, Mich. — Heath Co. has announced the ID-4001 computerized weather station, designed for pilots and others interested in the weather.

The microprocessor-based ID-4001 indicates time, indoor and outdoor temperatures, wind speed and direction and barometric pressure on an upright display panel utilizing large LED readouts. It will also display average wind speed and automatically calculate wind chill factor as well.

The ID-4001's memory allows instant recall of date and time of maximum and minimum temperatures, date and time of wind gusts and date and time of maximum and minimum barometric pressure. It can also indicate the barometric pressure's rate of change per hour and tell if it is rising or falling, the company added.

The ID-4001's 6-digit time/date display shows time in hours, minutes and seconds and the date in month and day. The time/-date can be displayed alternately or either may be displayed continuously. The 12-hour time format has an a.m.-p.m. indicator.

A 2-digit display shows wind speed in mile/hour, kilometer/hour or knots. A 16-indicator wind vector display identified by compass points and radial degrees indicates wind direction. The thermometer display indicates indoor or outdoor temperature in degrees F or C.

More information about the ID-4001, which is mail orderpriced at $369.95 for the kit ($595 assembled) FOB Benton Harbor, is available from the Heath Co., Department 350-730, Benton Harbor, Mich. 49022.

Line of Programs Multifaceted

MORRISTOWN, N.J. — Creative Computing has released more than 120 programs on 21 cassettes and two floppy disks.

The programs range from logic games, number games, educational simulations and drill and practice exercises to word games and graphics. Many of the programs are drawn from *Basic Computer Games*, its sequel, *More Basic Computer Games*, and *Creative Computing* magazine. However, most programs have been extensively modified to use the graphics of the computer for which they are intended — Commodore's PET, the Radio Shack TRS-80, Apple Computer's Apple II or Processor Technology's SOL-20, the firm said.

Each cassette tape contains an average of six programs and representative cassettes include Logic Games 1 and 2, Educational Simulations 1 and 2, Conversational Games, Number Games 1 and 2 and Gambling Games. Each cassette costs $7.95.

To ensure maximum reliability, two copies of each program are recorded on each cassette. The cassettes use professional-quality tape — high-density oxide, 100% calendered, low noise and high output, the firm said.

The cassette mechanism is a precision anti-jam design with Teflon coated 6-rib gasket, hard welded windows, double flanged rollers on stainless steel pins and double-

(Continued on Page 86)

Speech Synthesizer Supported

SANTA MONICA, Calif. — Computalker Consultants, designer of the CT-1 speech synthesizer, has unveiled its Software Package II, designed to expand the range of applications of the CT-1 board.

Software Package II contains CTEdit, a parameter editor; CSEdit, an editor for the CSR1 input; CTest, a CT-1 hardware diagnostic unit; Playdata, a device for playing the data files; Memvoice, a vocal memory dumper; Keyplay, a subroutine for playing letters or digits; and Piano, a simple musical keyboard, the company said.

Software Package II was written in 8080 assembly language and includes the source codes.

The Computalker CT-1 synthesizer is S-100 bus-compatible and can be operated in two modes: direct parameter control and phonetic. The direct parameter control mode produces high-qulality speech by sending data to the synthesizer's nine output ports at the rate of 900 byte/sec from a predetermined speech parameter data file. This produces highly intelligible and natural sounding speech, the company said. The characteristics and language variations of

(Continued on Page 86)

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Business Packages Run on 8080A Units

JOHNSTON, Iowa — The Midwest Computer Center has made available a complete set of business application packages for S-100, 8080A-compatible microcomputer systems. The applications include general ledger, inventory management, accounts receivable, job costing, accounts payable, payroll and text processing.

The programs were designed to run under the CP/M operating system, the firm said. The minimum configuration required is 32K memory, a CRT, dual diskettes and an optional printer.

Indexed Sequential Access Method (ISAM) file handling allows storage of data on 250 employees in payroll or 2,500 inventory items in single density.

The software packages start at $995 from Midwest Computer Center, 5785 Merle Hay Road, P.O. Box 188, Johnston, Iowa 50131.

System Eases Coding Of 32K, Other Devices

ISSAQUAH, Wash. — Data I/O Corp. has unveiled its System 19, which couples large amounts of random-access memory (RAM) with system software to allow programming of 32K devices, the firm said adding that future 64K and, 128K devices will also be accommodated.

Self tests and error detection are automatic and the system's plug-in programming packs provide correct currents and voltages specified by semiconductor manufacturers for maximum programming yields and reliability, the firm claimed.

The system's programming packs can be changed without disturbing RAM, which allows the partitioning of a program into different device configurations, the firm said. The system comes with 32K memory which can be expanded to 128K, according to the firm.

The System 19 recognizes "fatal errors" which could lead to misprogrammed parts, halts all activity and displays an appropriate error code. When data is transferred to the RAM from a master device or remote data source, a "sum check" is displayed. The displayed value can be checked against the previously recorded sum checks to validate the transfer, lhe firm said.

The System 19 costs $2,225 and typical programming packs are $450 each from Data I/O Corp., P.O. Box 308/1297 N.W. Mall, Issaquah, Wash. 98027.

Programs Cover Range

(Continued from Page 85)

locking, self-lubricating hubs.

Each cassette is packaged in a hard plastic library box and comes with an instruction booklet containing loading and running instructions as well as a description of each program on the tape.

Two Floppies

The two floppy disks each contain 50 programs recorded under CP/M with Microsoft Basic. Floppy-1 contains the first 50 programs from *Basic Computer Games* from Acey Ducey to Hi-Q. Floppy-2 contains the last 50 games from Hockey to Word.

The disks are manufactured by Maxell and are said to be of the highest professional quality. They cost $17.95 each.

Both disks plus the $7.50 *Basic Computer Games* book are available packaged together for the special price of $38.95.

Creative Computing software will be sold through retail computer stores, the company said. Tapes ($7.95) and floppy disks ($17.95) are also available directly from Creative Computing. Creative Computing Software can be reached through P.O. Box 789-M, Morristown, N.J. 07960.

Speech Unit Gains Uses

(Continued from Page 85)

the speaker are retained in the output, it added.

In the phonetic mode, the CSR1 Synthesis-by-Rule software converts Ascii phonetic text strings (for example, "HHEHLOW") into speech parameter data, then sends this data to the synthesizer to produce speech.

Software Package II comes with source code and is priced at $30. It is available at most computer retail stores nationwide or may be ordered direct from Computalker Consultants at Suite A, 1730 21st St., Santa Monica, Calif. 90404.

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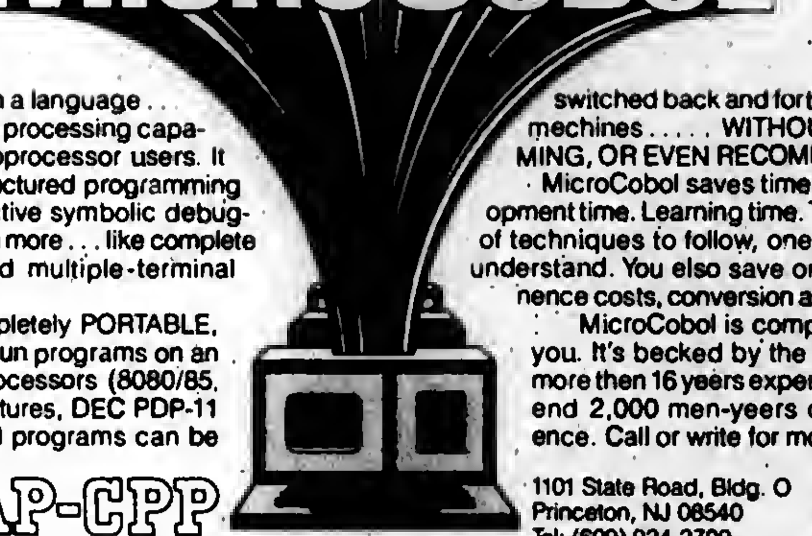

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Despite Mini Mart Curbs

Brazil Still Ripe for Larger Systems

By Nancy French
CW Staff

RIO DE JANEIRO, Brazil — Even though the minicomputer market here has been pretty well closed to U.S. and other foreign companies [CW, Nov. 6], there's still plenty of business in Brazil for vendors who import medium and large systems.

Many vendors whose mini plans were rejected or not even considered by the government are in various stages of developing plans for the local assembly of medium-sized systems — the next area to be "protected" in Brazil's attempt to establish a domestic DP industry. These plans must be approved by the Commission for the Coordination of EDP (Capre).

Other vendors have taken a hard line, however, indicating they would prefer to leave the market rather than do business with a Brazilian partner.

In large systems, Itel Corp. made a rather impressive show of force at the recent National Congress for Data Processing here. On display at its booth was an AS/4, Itel's alternative to the IBM 370/148. This system has advantages for the Brazilian user since it is field-upgradable to an AS/5 — a 370/158-size machine — except for one glitch.

Since the Itel machine is imported, the user must go through a time-consuming approval process with Capre to obtain one. Because the IBM 370/148 is assembled here, a user can buy it without Capre approval.

This difficult approval process has led some users to consider such "laughable configurations" as linked 148s, one user who asked not to be quoted by name said. "At least you'll get it when you need it."

Unless Itel plans to manufacture the AS/4 in Brazil some time in the future, the system may be a big seller in Mexico and Argentina, but not here. Itel's larger models seem to stand a better chance, however, since all systems larger than the 148 must be imported.

Itel denied plans to manufacture in Brazil even though rumors indicate that National Semiconductor Corp. may be interested in such a venture. Bill McPherson, who heads the company's Brazilian operation, said Itel plans to import the AS/4 and any other models sold here. The vendor has been selling in South America for only a few months and has already placed three systems.

IBM has been negotiating with the government to manufacture its Series E equipment here sometime after the first of the year, when it is officially announced in the U.S., according to reliable sources. However, this was not confirmed by IBM.

IBM currently markets the 3031, 3032 and 3033 here for sale and lease, although none have yet been placed. These models will all be imported, the company said.

IBM also sells the 370/148, manufactured here; most peripherals are also imported.

NCR Corp., whose application to continue its activity in the minicomputer area was re-

(Continued on Page 90)

Anti-U.S. Moves Overseas High on Adapso's List of Issues

By Marcia Blumenthal
CW Staff

ORLANDO, Fla. — The continuing efforts of Canada, Japan and France to keep U.S.-owned computer service firms from incorporating or gaining a controlling ownership of firms in those countries is one of the major issues the Assocation of Data Processing Service Organizations, Inc. (Adapso) will address in 1979.

The intransigence of these countries threatens the ability of service firms to serve their multinational corporate clients, according to Richard L. Crandall, Adapso president and president of Comshare, Inc. Moreover, Adapso's membership believes the actions of France, Japan and Canada may be a unique form of antitrust activity because service firms from those countries can and do incorporate in the U.S.

None of Adapso's members feels the sting of this problem more acutely than Crandall. The Canadian government recently blocked Comshare from increasing its ownership in Comshare, Ltd. from 11% to 79%. Presently 68% of that Canadian firm is owned by Polysar Corp., which is owned by the Canada Development Corp. which, in turn, is largely owned by the Canadian government.

That decision, Crandall admitted in a recent interview at the Adapso annual meeting here, came as a surprise.

Comshare had met all visible objections raised by Canadian government officials, Crandall claimed, so "we consider the rejection to be political."

Comshare promised increased employment of Canadian nationals after acquiring a controlling interest in Comshare, Ltd., he noted. In addition, the company committed itself to increased spending in Canada for software research and development and agreed to Canadian-based processing that would ensure that data bases would remain in Canada.

Since its rejection, Comshare bought out Canada's 55% interest in Comshare International B.V., increasing ownership in Comshare, Ltd. to 27%.

The government's action was all the more surprising because Adapso's Canadian counterpart, the Canadian Association of Data Processing Service Organizations, had come out in favor of foreign acquisition as long as the acquiring firm continued to process data in Canada and hired Canadian nationals in management positions.

Crandall's belief that the rejection was political stems from a general attitude among

(Continued on Page 88)

Aggressive Forays Into Software Planned by Both Itel and Amdahl

By Marcy Rosenberg
CW Staff

SAN FRANCISCO — While their approaches may differ, Itel Corp. and Amdahl Corp. have recently moved more aggressively into the burgeoning software market.

Itel's strategy is to buy marketing rights to previously developed software. Amdahl is taking a "total systems approach," developing and marketing software to users of its IBM-compatible mainframes.

The independent systems software market is worth $300 million to $400 million, and it is growing at an annual rate of about 26%, Bob Cabaniss, Itel's vice-president of software marketing, estimated. This market could hit "over $1 billion by 1982," he added.

To more actively pursue this market, Itel recently formed a software marketing unit of 30 sales and support personnel which is headed by Cabaniss, formerly vice-president of systems and software support. The unit is part of Itel's Data Products Group.

Itel decided "to identify software as a product" rather than continue to use it only as a tool to back up hardware sales, Cabaniss said. The firm previously sold software products through its systems support organization, he noted, but mainly "to enhance our disk drives and help us sell off our 360 programs."

The objective now will be "to find pack-

(Continued on Page 94)

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Guide to List 3,000 Systems Houses, Mini OEMs

HUDSON, Mass. — A 500-page *Directory of Systems House & Minicomputer OEMs* will be published by Sentry Computer Services, Inc. in December. The directory will list more than 3,000 systems houses, turnkey systems suppliers, dealers and other resellers of minicomputers, according to William A. Gannon, Sentry president.

Existing system house listings offer printouts that are useful as sales prospecting tools for minicomputer and peripheral suppliers seeking to sell their products to systems houses, Gannon noted. Sentry's directory, on the other hand, is intended primarily to help systems houses achieve a broader market exposure while giving prospective end users a guide for locating suppliers of standard and customized systems, he said.

Minicomputer-based products and turnkey systems sold through systems houses and other OEM channels account for annual sales in excess of $2 billion, according to Sentry's research, yet these sources of supply are relatively unknown because of their regional or vertical market specialization, he pointed out.

Four separate indexes will allow the user to locate systems houses by name, by geographic location, by any one of more than 100 application specialties and by the name of the firm's minicomputer supplier. An alphabetic index will contain each firm's name, address, phone number, top executives, number of employees, annual sales and a full description of its products.

The directory listings were computerized at Sentry's data center to facilitate sorting, updating, profiling and statistical analysis. In connection with this publishing effort, Sentry developed a proprietary software package labelled Capitalization and Type Spec (CATS), which converts a disk file data base to magnetic tape while simultaneously capitalizing and inserting the typesetting codes used in driving a Mergenthaler phototypesetter.

The directory will cost $347 from Sentry Publishing Division, Sentry Computer Services, Inc., 5 Kane Industrial Drive, Hudson, Mass. 01749.

Moves Against U.S. Firms Rank High on Adapso's List

(Continued from Page 87)

Canadian officials that the computer services industry is a sensitive one. This attitude began in 1969, Crandall explained, when a document known as "the Green Paper" was circulated. The Green Paper deduced that because of tie-ins with telephone lines, the computer service industry was going to become a public utility.

"The attitude among U.S. firms is that the Canadian government is hostile," Crandall declared.

On the other side of the Atlantic, France, the largest computer services market in Europe, requires that U.S. service firms providing services in France have a licensing agreement with French firms. Compounding the problem is the fact that the French government owns some service firms as well as the telephone system.

Similarly, government ownership of the telephone lines in Japan has thwarted U.S. companies from establishing wholly owned firms there. But blocking the incorporation of U.S. firms in Japan and France has been done by delay rather than overt rejection, Crandall observed.

While these government tactics will probably not affect the overall growth of the computer service industry, they do cut into the service these firms can provide their multinational clients, Crandall said. Moreover, "equity control allows you to control the quality of service to clients."

Courses of Action

To combat anticompetitive moves by foreign governments, Adapso is now considering several courses of action. "We are at the point now where we are doing research to see what course of action to take," Crandall said, adding that within the next six months Adapso will finalize its strategy.

One broad alternative is to work with foreign trade associations and government bodies. Another is to develop a mechanism whereby the U.S. could retaliate.

"We have already had several sessions with the State Department," Crandall noted.

High on Adapso's research list is the question of whether blocking maneuvers by foreign governments whose nationals are allowed to incorporate in the U.S. may be considered a unique form of antitrust activity.

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Antitrust Suit Asks $90 Million

Developer of Reality Software Sues Microdata

By Marcia Blumenthal
CW Staff

IRVINE, Calif. — A recent lawsuit brought against Microdata Corp. by Pick & Associates, Inc. here raises questions about the rights of individuals and companies engaged in the development of proprietary software and firmware.

Pick's $90 million antitrust action is a cross-complaint to charges of misappropriation of trade secrets filed by Microdata in August 1977. Pick's suit contends that Microdata is involved in a conspiracy to restrict Pick's ability to compete with Microdata.

The seed of the issue, according to the suit, dates back to 1973, when Microdata and Pick entered into a series of contractual arrangements. These arrangements were originally sparked by Richard Pick's development of the software and firmware for Microdata's hardware.

This effort resulted in the development of the Reality system marketed by Microdata.

At that time, Pick and Microdata decided to work together to evolve the Reality system, agreeing to hold joint rights to any product enhancements made during the term of the contract. Pick was then working as a consultant for Microdata.

Pick's Marketing Option

In 1975, the litigants altered the joint ownership agreement, replacing it with one which, among other things, granted Pick an unlimited, nonexclusive license to market Reality-type systems.

The result of the joint labor produced software and firmware enhancements termed "Reality Improvements," the brief indicated. After the two firms split in December 1976, Microdata continued to work on the Reality product, dubbing it "Royale." Pick did the same, terming its product "Evolution."

Pick subsequently exercised its marketing option and is currently shipping computer systems with hardware manufactured in part by a French firm, Intertechnique. These systems utilize Pick's advanced Evolution software and firmware, the brief explained.

Now Microdata is claiming, according to Pick's charges, that the Evolution product incorporates trade secrets belonging to Microdata.

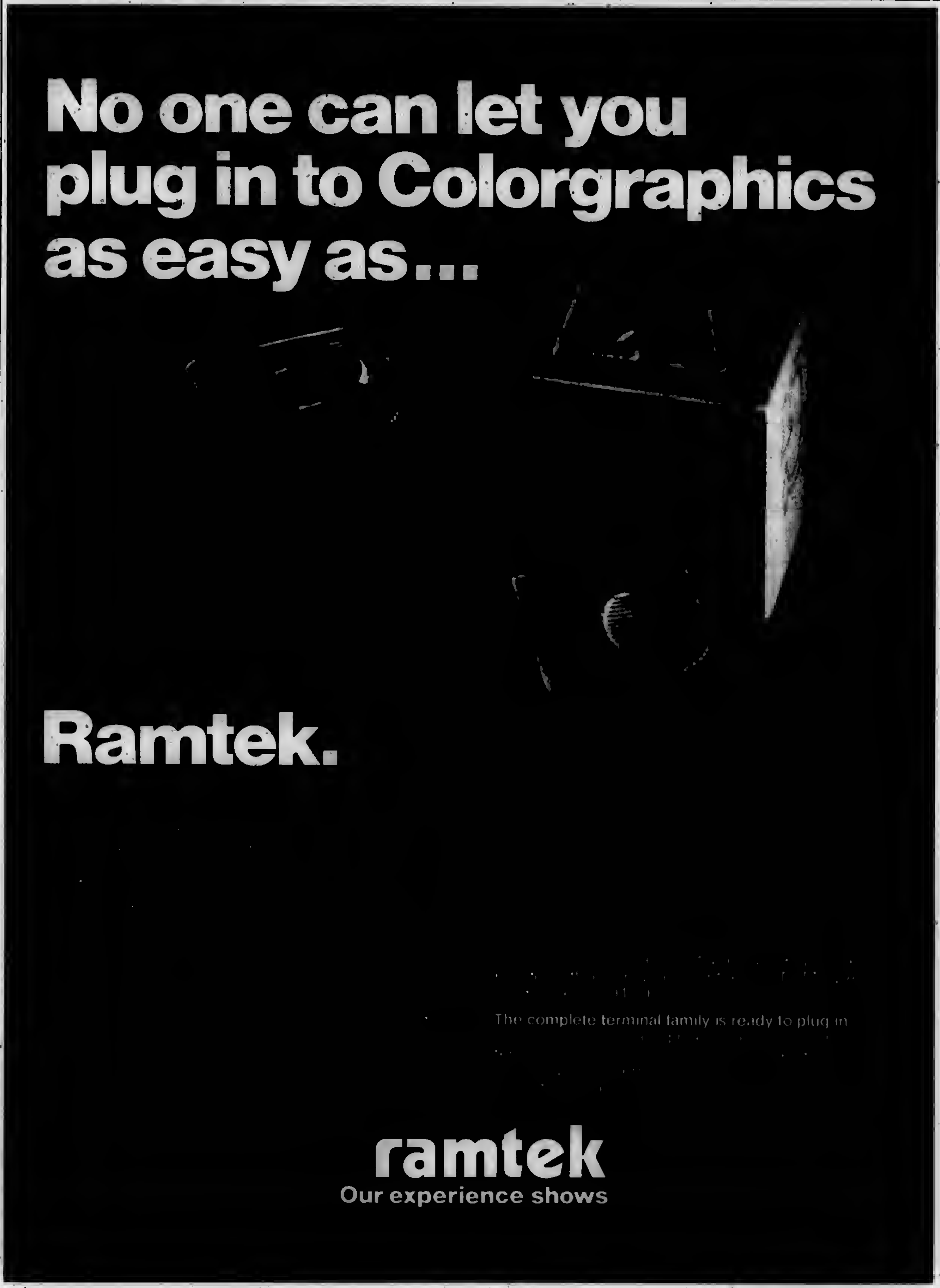
Cross-Complaint

Pick's cross-complaint alleges that Microdata "continues to make false statements to present and prospective purchasers of Pick's products to the effect that Pick's products have bugs and hence will not operate properly; that to purchase Pick's products is to make a poor business decision because Pick is an unstable organization and will not be around in the future to service the product; and that Pick does not have the right to sell the computer software or firmware."

The purpose of making these statements, Pick contends, is to induce other corporations not to do business with it. But Pick claims it is in sound financial condition and, in fact, has the right to market the software and firmware products.

At present, Pick's suit states that Microdata is exacerbating matters by refusing to service Reality systems that include Pick peripherals and by not making royalty payments to Pick on time.

One theory advanced by Pick in its suit is that Microdata is attempting to lower the value of Pick's stock so it will have to sell out to Microdata.



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Brazil Still Ripe for Big Systems

(Continued from Page 87)

jected, is emphasizing its 8000 series, computer output microfilm systems, microfiche copiers and check-encoding equipment here.

An NCR sales representative said the company "has no plans" to do business with a Brazilian partner and instead plans to manufacture its systems for this market in Mexico and import them under the provisions of the Latin American Free Trade Association to which both nations belong.

Burroughs Corp., which has held a strong position in Brazil — second only to IBM — stands to lose the most under the latest minicomputer import regulations. However, a spokesman said the firm plans to put more emphasis on the B6700, B4800, B3800 and B2800 and associated line printers, disk drives and magnetic tape units.

Burroughs has already received permission to manufacture a line printer and magnetic tape here and plans to phase in greater peripherals manufacturing efforts.

It has also proposed as part of a "medium-scale" project a plan to manufacture the B2800 and B6800 here, according to a government source. No Brazilian partner was named.

Burroughs has about 160/0 of the installed base of general systems and 390/0 of the installed minis, according to 1977 figures from market research firm International Data Corp.

Honeywell Proposes Venture

CII-Honeywell Bull markets the Level 62 up to 256K, the Level 64 with up to 512K and the Level 66 with up to 512K, all with associated peripherals. All are imported: the 62 from Italy, the 64 from France and the 66 primarily from the U.S.

For its medium-scale project, Honeywell has proposed a joint venture with Brazilinvest, a local investment bank, and an unnamed third partner to manufacture the Level 64 system here, according to a government source.

Fujitsu Ltd. is negotiating a proposal with Serpro and Digibras, a project that calls for one-third Fujitsu capital, one-third government investment and one-third investment from a Brazilian partner. No additional information was available about the system proposed or the Brazilian partner.

Control Data Corp. sells add-on memory and plans to market the Cyber 170 series here, but at present only offers service bureau services, a sales representative explained.

Univac has applied to manufacture its 90 series here and, if its proposal is accepted, will launch that operation in about a year and a half. In the meantime, the firm is marketing its 1100 and 90 series equipment.

Digital Equipment Corp. is emphasizing its Decsystem-10 and 2020. These systems are offered with imported peripherals and locally produced Scopus terminals.

Sources said DEC will soon submit a proposal to Capre to manufacure its Decsystem-20. No further details could be learned.

Despite the restrictions on minicomputer imports that have seriously affected its smaller mini systems business, the PDP-11/60s, PDP-11/70s and some PDP-11/34s will continue to be imported for specialized process control applications, a DEC spokesman said.

Data General Corp., too, is no longer actively marketing small systems but expects to sell some for use in process control for Kodak automated film developing system..

The firm is emphasizing its larger Eclipse line, which handles 256K bytes up to 2M bytes of main memory, according to Ken Brandt, Manager of Latin American sales for DG International Sales Corp.

As for Jose C. Melo's "incredibly good job of manufacturing a machine as similar to the Nova 3" as the Sisco MB 8000 has turned out to be, Brandt said DG "intends to take appropriate legal action under the laws of Brazil" to assure its copyrights are protected.

Brandt does not think the system was patented because by the time most systems could complete the patent process, their product life is over. However, the circuit boards are copyrighted and are therefore protected, he said.

He declined to say whether he thought the machine was a copy.

The government policies are still in a transition phase regarding local manufacture of peripherals. So are the vendors. BASF Systems, Inc. is selling all imported drives from Germany and Japan, but plans to begin manufacturing magnetic tape here in 1979 as an adjunct to its already active audio tape market.

Memorex Corp. is showing but not selling media and has applied for permission to manufacture locally.

Ampex Corp. is selling its line of mini peripherals and has a proposal before Capre to manufacture in Brazil under license to Microlab S.A., a spokesperson said.

The Brazilian Computer Market Outlook
Projected Annual Sales in Units
1978-1982

Category	1978	1979	1980	1981	1982	1978-82
Mini	2,500	2,980	3,420	3,670	4,050	16,620
B*	1,540	1,590	1,800	1,930	2,100	8,960
C*	960	1,390	1,620	1,740	1,950	7,660
Small	170	255	290	375	440	1,530
D*	140	210	230	280	310	1,170
E*	30	45	60	95	130	360
Medium	12	21	27	38	53	151
Large	16	29	43	56	73	217
Very Large	13	14	15	16	17	75
Super	2	2	2	3	3	12
Totals	2,713	3,301	3,797	4,158	4,636	18,605

* Digibras categories; B — $18,000-$44,000; C* — $94,000-$156,000; D—$156,000-$312,000; E — $312,000-$940,000.

Digibras Chart

Despite the uncertainty in the Brazilian computer marketplace that has government controls in the minicomputer area and anticipated controls in the medium-scale CPU area, significant sales are projected. New figures on projected annual sales of computers and peripherals here are expected soon, but these estimates are the latest available at this time.

Expansions

Scientific Systems Services, Inc. has begun construction of an addition to its headquarter facilities located at Rodes Blvd. and Ellis Road in Melbourne, Fla. The facility will be approximately 10,000 sq. ft. The property is leased with an option to purchase.

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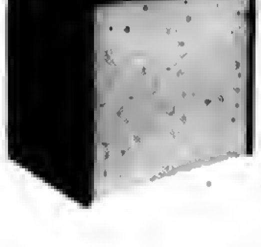

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(WARNING: there may be more than one right answer to each question)

1. Model 85 is:
- (a) a remote information system we first introduced in 1978.
- (b) a distributed data processing product.
- (c) a multifunction data processing product.

2. Its features include:
- (a) multitasking for up to four applications.
- (b) large disk capacity.
- (c) modular configuration.
- (d) more than these.

3. New improvements are:
- (a) increased processor memory to 256K bytes.
- (b) the addition of remote workstations and printers.
- (c) increased disk storage to 100 MB.

4. Model 85 functions are:
- (a) remote file management and high level language processing.
- (b) on-line file management and stand-alone processing.
- (c) batch communications and volume data entry.

5. Available languages are:
- (a) RPG II.
- (b) COBOL.
- (c) ESPERANTO.

6. Model 85 saves users money as an alternative to:
- (a) enlarging mainframes overburdened by network interactive applications.
- (b) adding communications lines with greater capacities.
- (c) maintaining a mainframe configuration only fully used at peak time periods.
- (d) losing time and money due to mainframe downtime.

7. For more details on Model 85, you should:
- (a) phone your nearest Data 100 sales office or one of the numbers we've listed.

Now check your answers.

All answers but these three are correct.

2a: Model 85 offers multitasking for up to *eight* applications.

3c: 100 MB is old figure; Model 85 is now *245.6 MB* disk storage.

5c: No, Model 85 doesn't speak it. Yet.

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THE "WAVES" IS HERE!

Charles P. Lecht's new book, *The Waves of Change*, is off the press and ready for shipment. It incorporates the serialized excerpts that appeared in *Computerworld* between April and October, 1977, with significant updating and revision, brand new material not previously published, and a host of informative illustrations.

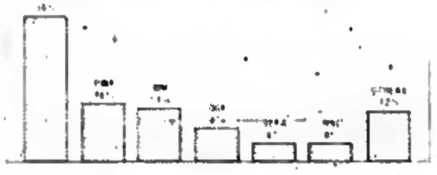
The Waves of Change presents a global view of the data processing industry, assessing the technological and economic currents by which it has been, is, and (in the author's extensively documented opinion) will be directed in future.

Furthermore, it accounts for the impact on developments in the DP field of the psychology of both users and vendors. Patterns of thought and perception, and the ways in which such patterns manifest themselves through judgments affecting the direction taken by technology and product planning strategies, are certainly at least as vital to our understanding of the state of the DP art as are the purely "technical" breakthroughs themselves.

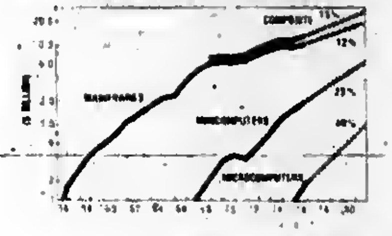
The Waves of Change addresses developments in the hardware and software realms —both single events and "trends"—at length. It explores the competitive positions of manufacturers, the middle- and long-term impact of the burgeoning mini/micro families, the problems faced by corporate management in assessing the role of hardware/software usage methodologies (and the value of specific systems) as these apply to their particular needs, and many other subjects of intense interest to all who are affected by DP.

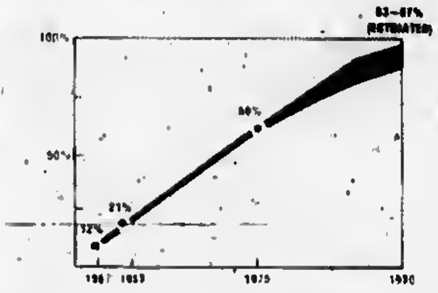
The Waves of Change is a series of wide-ranging essays united by a dual sense of purpose: to assist the reader in evaluating where we are (and why); and to provoke him to consider the implications of rapid change upon his ability to adapt and survive.

Estimated Shares of 1976 Minicomputer Shipments of $2.0 Billion

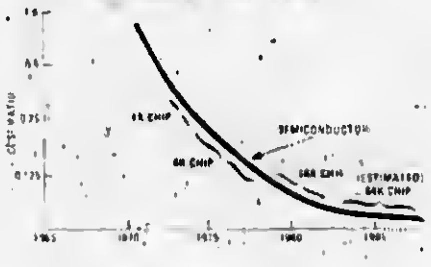


Estimated Shipments and Combined Totals by Year

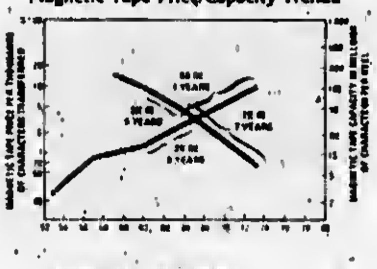




Main Storage Cost Trends

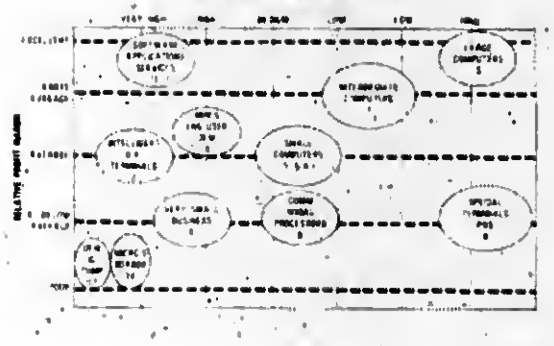


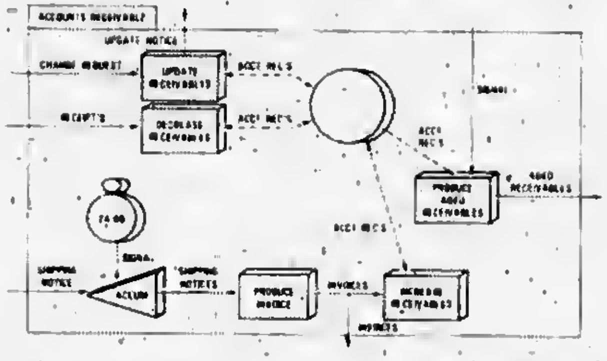
Magnetic Tape Price/Capacity Trends



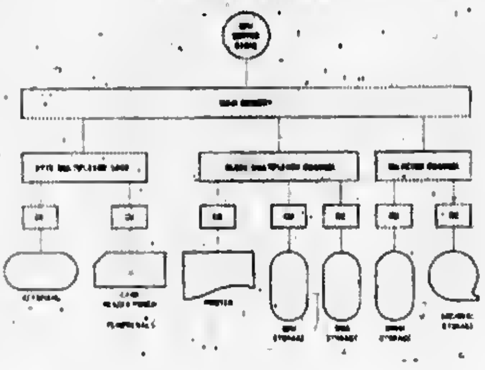
AT&T DDS Cities Originally Projected For Service in 1976

Dollar Growth Rate Per Year

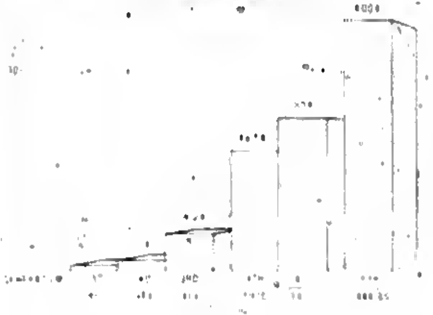




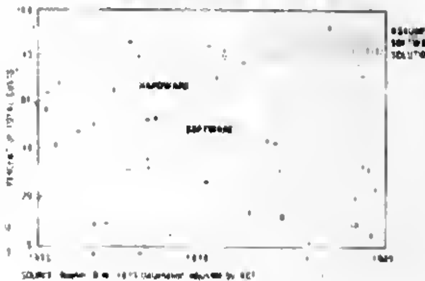
Current Machine Organization



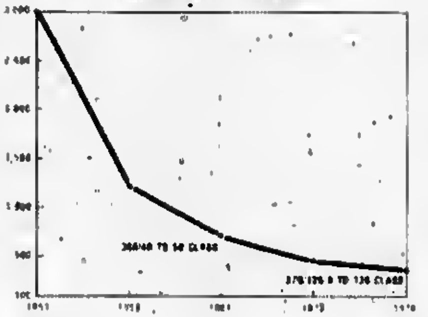
IBM Processor Memory Capacity Per Dollar of Rental



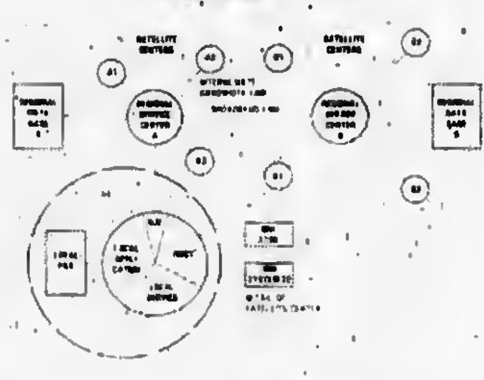
Hardware/Software Cost Trends



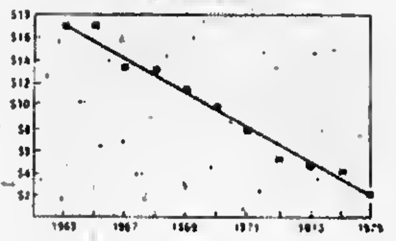
Average Computer Purchase Price 1953-1978 (In Thousands)



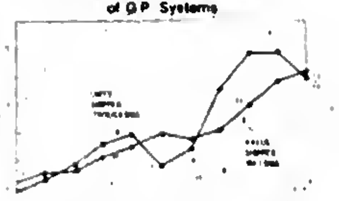
Regional/Local Network



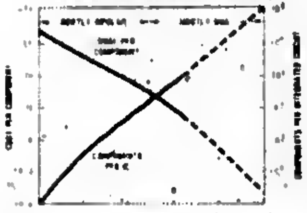
Average Yearly Price PDP-8 With 4K Memory (In Thousands)



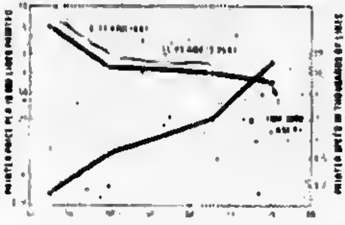
U.S. Mfg. — Worldwide Shipments of G.P. Systems



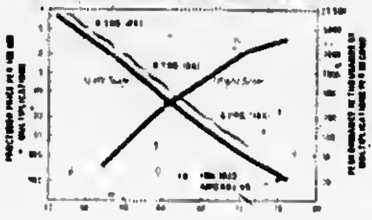
Cost Evolution of MOS Circuits



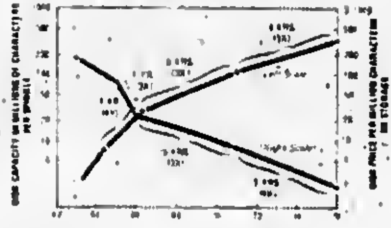
Line Printer Price/Performance Trends



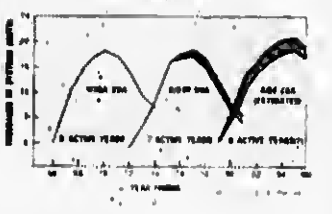
General Purpose Processor Price/Performance Trends*



Disk Price/Capacity Trends



Total Shipments



ABOUT THE AUTHOR

Charles Philip Lecht is founder, President and Chairman of the Board of Advanced Computer Techniques Corp. (ACT), a computer software and consulting firm.

Lecht holds a B.S. in mathematics from Seattle University and an M.S., also in mathematics, from Purdue. His involvement in the computer field extends back to 1951, making him an "old-timer" in a very young industry. He founded ACT in 1962. Since then the company has grown from a one-man show to an international complex employing some 400 persons.

Lecht is a noted speaker and author whose books, in addition to *The Waves of Change*, include three on computer languages and one on project management.

Lecht is a member of the **Young Presidents Organization, The Hudson Institute,** the **DPMA,** the **ACM** and the **New York Academy of Sciences.** Profiles of him have appeared in the *New Yorker* and *Datamation*, Recently, he has been asked by the CBEMA to argue its case against the proposed I/O Interface standard before the Brooks Subcommittee of the U.S. House of Representatives.

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Testimony on IBM Revenues Hit on Definition

By Connie Winkler
CW Staff

NEW YORK — The most important aspect of IBM controller C. Arthur Northrop's recent testimony in the U.S. vs. IBM antitrust may be not what he said, but what he didn't say.

Northrop simply presented to the court various IBM revenue totals for 1952-1972. Totals included both DP and nonDP product and services revenues.

For example, IBM's U.S. DP revenues totaled $30,838,000 in 1952, $3,911,748,000 in 1968 and $4,254,672,000 in 1972.

The definition of "DP" and "nonDP" is what bothers the government. Both in cross-examination of Northrop and in conferences in the chambers of Judge David N. Edelstein, government lawyers asked IBM for the criteria used to determine what products and services were and were not DP.

IBM responded that it used the criteria set out in the 1956 Consent Decree and that it would be presenting economic witnesses who would give yet more definitions of "DP" and "nonDP". The company contended that under none of these definitions would it be shown to have a monopoly.

Need for Redefinition

The government argued it is necessary to have foundation definitions of "DP" and "nonDP" beyond the general distinctions made in the Consent Decree. For example, when used with a computer magnetic recording tape is considered a DP product by IBM, but when used with an audio tape recorder it is termed "nonDP."

IBM lawyer Ronald S. Rolfe called Northrop an important witness who laid the foundation for a lot of coming testimony. Northrop quantified IBM's DP products and services so they can be compared with those of other vendors. Rolfe said IBM is now readying 600 to 800 depositions from other vendors which state their revenues.

Lead government lawyer Robert J. Staal said the government believes IBM will compare Northrop's figures with the total of IBM plus all the other vendors in the depositions to show that IBM has only about 35% of the total DP market. IBM's pretrial brief in 1975 said the company intended to show that based on the deposition figures, IBM's DP revenue had decreased from 55% of the total DP revenues in 1957 to 32% in 1972.

The government has previously presented figures on the sale and leasing of general-purpose computers — which it defines as IBM's market — showing that IBM has a 70% share.

Northrop's direct testimony was actually 18 written pages stating his credentials and the procedure used to arrive at the figures in the exhibits. Presentation of the written statement, an innovation agreed upon by both sides to expedite the trial, took five minutes of actual court time. Cross-examination spanned five days.

During that cross-examination Northrop, who has ultimate responsibility for maintaining all of IBM's accounting books and records, said he basically only tallied the revenues. Product revenues to be tallied were picked by IBM counsel.

IBM does not use such figures in the daily operation of business, the controller said, although the underlying data is from the corporation's books and records.

Systems Statistics

The government barraged Northrop with questions on whether IBM maintains systems statistics. Northrop admitted IBM does but said it is done only for limited purposes, such as assuring that different products shipped from different plants arrive at the customer site at the same time for efficient assembly.

The Justice Department contends that IBM markets systems and therefore holds a tighter grip on customers than if it merely marketed boxes or separate machines.

Northrop also said IBM's income from investments, which the company refers to as interest income, is not included in revenues anywhere within IBM nor in the exhibits he presented to the court.

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Itel, Amdahl Aggressively Moving to Software

(Continued from Page 87)

ages that have been written, already have a small user base and are well-documented, that I can pick up on a royalty basis and take to the marketplace," Cabaniss said.

In about a month, Itel will begin marketing an assembler sort program for IBM 370s and plug-compatible CPUs through a nonexclusive worldwide marketing agreement with the developer, Watson M. Conner, Inc., an independent software firm.

Initially, Cabaniss said, "we will lease the program, with fixed-length capability only, for $100 a month. However, the author will be adding to it, making it a full service source program with fixed- and variable-length capability which we will offer in mid-1979 for $24,000 or lease for $650 a month."

This is one of three or four new software products the marketing unit plans to offer, according to James P. Gafke, president of Itel's Computer Products Division (CPD). Through the software group, which will have sales personnel in all branch offices, "we will market differently than we have been for our Advanced Systems (AS). These new software products will be marketed not only to run on our mainframes, but also to run on IBM CPUs," Gafke said.

In marketing software, Itel "will make use of resources already in place," Cabaniss noted, citing over 200 AS users — including the AS/4, AS/5 and AS/6 — and over 250 users of Itel-generated software packages used on IBM 360s for which his firm provides support.

The software marketing organization will also sell Itel's remote program development system, Maestro, introduced last month [CW, Oct. 9]. Maestro marked CPD's entry into minicomputer marketing, Cabaniss said.

Itel was also "encouraged by the IBM 8100 and System/38 announcements," he said. "By charging for all the software and systems control programs, IBM is attempting to move part of the profitability out of hardware and into software. We think software will be a growing sector in information processing."

Apparently sharing this view, Amdahl will initially concentrate on developing software for its 470 operating system, according to Asa W. Lanum, recently promoted from manager to director of software product development.

Lanum heads Amdahl's 30-engineer software development group, which introduced a software replacement for IBM's MVS assist microcode and has developed a VM "hypervisor," said to offer performance advantages over IBM's standard VM.

While declining to give specifics on future software products, Lanum noted they would be targeted for 470 users in the system control program area. Amdahl expects to deliver the first of these to the market "within the 1980 calendar year."

The development effort was not spurred by any problems with software the firm currently purchases from outside vendors. "It was a natural kind of evolution for us. We realized we would have to be more than a mainframe vendor and started looking at software to be able to provide a full range of services and support," Lanum noted.

To date, Amdahl has sold less than 200 of its 470 systems and "is hoping to increase that market by providing software as well as hardware," he observed.

Some of the Amdahl software products may be used on IBM-compatible mainframes other than Amdahl's, he said, adding the software will not be offered as a package with hardware but will be independently licensed to users. However, he noted, "licenses will be offered only at locations with a 470 on the site because of the need for support."

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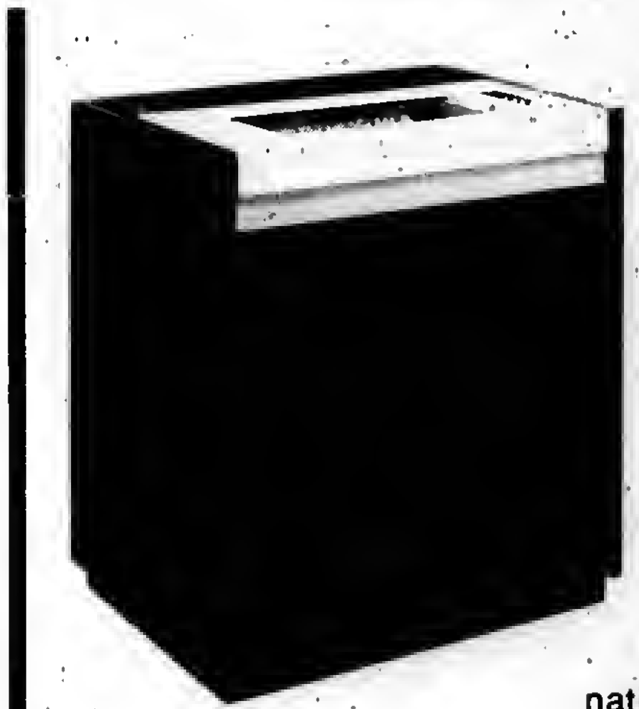

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Supershorts

Bell Laboratories has tentatively agreed to purchase a Cray Research, Inc. $8.8 million Cray-1 computing system for installation by the fourth quarter of 1979 at its Murray Hill, N.J., computing facilities. Acquisition of the 1M-word system, expected to provide the Murray Hill computing facilities with the capability to do very large scale numerical calculations, is subject to successful completion of contract negotiations by February.

— — —

Structural Dynamics Research Corp. (SDRC), an engineering consulting firm in Milford, Ohio, has licensed to Tektronix, Inc. its finite element modeling program for Tektronix's minicomputer-based equipment. Tektronix will have the right to sublicense this program to customers and provide "fully integrated hardware/-software systems," according to Lawrence E. Mayhew, Tektronix group vice-president.

— — —

Integral Data Systems, Inc., printer manufacturer, has moved to a 20,000 sq.-ft. facility in Natick, Mass. about four times the size of its Watertown, Mass., facility.

— — —

Electronic Product Associates, Inc. has signed Asci of Toledo, Ohio, as exclusive marketer and distributor for its line of microprocessing trainers and related products.

Consumer-Oriented Approach Urged

Stress Product Image, Software Vendors Told

By Marcia Blumenthal
CW Staff

ORLANDO, Fla. — Software products can be sold in pretty much the same way as Procter & Gamble peddles soap, according to Robert H. Randolph, director of marketing for Azrex, Inc.

With 1,000 vendors touting 4,000 software products, the problem of differentiating these offerings becomes acute, and stressing the clever technological features of products may not result in sales, Randolph warned. To be successful, the software marketer should develop "perception-based" product marketing techniques, he maintained.

These techniques are closely allied to consumer marketing methods in which the image of the product is featured rather than the endless details of product ingredients.

Marketers of consumer products generally conjure up an image for their products, stressing the major benefits the consumer will derive from them.

This same technique, Randolph maintained, will work for industrial marketers selling technologically sophisticated products. However, this strategy, assumes that the software vendor has a good product.

Randolph delivered this message at a crowded, informal session of the 49th management conference sponsored by the Association of Data Processing Service Organizations, Inc. (Adapso) here recently.

Randolph said that consumers are culturally conditioned to buy perceptions of products. "By concentrating on perception, a vendor can get away from spending money on engineering new product features that don't contribute to the value of the product."

Rather than pouring money into questionable engineering efforts, the vendor can direct its financial resources to promotion activities, he said.

Developing a "Story"

"In order to get to the point where a customer will buy your product on reputation, you have to have a story. Hone in on what the customer needs and tell the story of how your product will solve his needs," Randolph stressed. However, developing and promoting that story requires creativity and money, he warned.

A common attitude in the industry, Randolph claimed, is that "technicians develop the product and then do marketing in their spare time." Technical people marketing software products tend to oversell the technical features, he contended.

Commenting on Randolph's approach, Allan Hufft of University Computing Services said that his company did a survey on the last 100 sales they lost but thought they should have closed. In analyzing the situation, Hufft noticed that the company was selling the same technical features as five or six other companies. But he concluded that the initial focus should have been on making the customer "comfortable" with the solution the product offered rather than on pounding home the nitty-gritty details of the item.

A product image is acquired in several ways, Randolph said. Like consumer product marketing, "perception-based" marketing of technical products should stress ease, he noted.

The product must be easily demonstrable to the prospective customer. "Sit the customer down, using his own data, and have your product generate a report," Randolph said.

Make It Easy

In addition, ease of maintenance and support must be stressed, and documentation has to be brought down to the "8th-grade reading level."

Sales aids have to be developed with an eye to what the customer is going to do with the sales literature, Randolph said. For instance, a technical person may be handing the sales literature over to a non-DP-type executive for a purchase decision.

Finally, the customer must perceive that the vendor has a clear product strategy, Randolph emphasized. For example, products offered by some software companies may be too diverse and not "play together."

"Avoid the image of a hodge-podge of products," he concluded. "The idea of a 'family' of products inspires confidence in the customer."

The day is not too far off, Randolph forecast, when software vendors may give away the CPUs to use with their products. The hardware is the vehicle, but the software is the solution to the problem.

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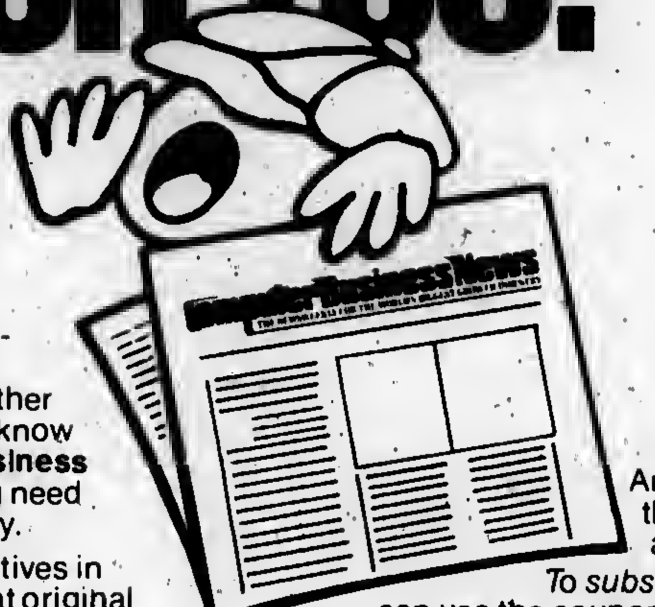

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Imlay Tops List of Adapso's 1979 Officers

ORLANDO, Fla. — The 1979 slate of officers was announced during the 18th annual meeting of the Association of Data Processing Service Organizations, Inc. (Adapso) held here recently.

As of today, Adapso will be headquartered in Rosslyn, Va. The move was undertaken in part to allow the organization to be close to the nation's capital to more effectively engage in advocacy activities.

Last year 59% of Adapso's $850,000 budget was spent in attempts to prevent unfair competition. Much of this activity is centered on lobbying efforts, an Adapso official said.

President-elect of the 352-strong corporate membership, which increased by 70 members in 1978, is John P. Imlay Jr., president of Management Science America, Inc.

Lawrence J. Shoenberg, president of AGS Computer, Inc., is treasurer.

Senior vice-president is A.S. (Buck) Blankenship Jr., president of Data Processing of the South, Inc.

Six Committee Heads

In addition, six vice-presidents in charge of committees were elected. Thomas J. O'Rourke, Tymshare, Inc.'s president and chairman of the board, will serve as vice-president of the Communications Committee, which oversees issues related to transborder data flow and AT&T's Advanced Communications Service.

The vice-president in charge of the Government Relations Committee is Robert E. Weissman, president of National CSS, Inc. That committee oversees taxation issues.

Next year the Government Relations Committee is expected to increase lobbying and advocacy efforts to help increase informed legislation. Adapso testified six times before Congress last year.

Adapso's 1978 president, Richard L. Crandall, president of Comshare, Inc., will serve as the 1979 vice-president of the Image Committee. In that capacity, Crandall will oversee press relations, the annual report and dealings with financial analysts.

Bruce T. Coleman, senior vice-president of Informatics, Inc.'s Products Division, will serve as vice-president of the Software Issues Committee. Coleman will be involved in defining software, protecting software products and attracting talent to the software industry.

Frederick S. Lafer, vice-president and secretary of Automatic Data Processing, Inc., is vice-president with responsibility for the Competitive Practices Committee. He will oversee issues related to competition presented by auditing firms entering the computer services industry.

Rounding out the list is Arthur M. Kramer, president of Praxa Data Centers, Inc. Kramer will serve as vice-president in charge of the Education and Self-Development Committee which organizes seminars and conferences and also handles research and statistical tasks.

This year, according to Crandall, Adapso's members accounted for 45% of the revenues of the computer services industry, up from 42% last year.

Midcon Planned For Dec. 12-14

DALLAS — About 400 exhibitors are expected to turn out for the Midcon Electronic Show and Convention scheduled for Dec. 12-14 at the Dallas Convention Center.

The 544-booth exhibition will be preceded by a full-day marketing conference and keynote luncheon at the Dallas Hyatt Regency on Dec. 11, a Midcon spokesman said.

Pasquale A. Pistorio, vice-president and worldwide marketing director for Motorola Semiconductor Products, Inc., will deliver the keynote speech on the growth and scope of semiconductor technology, its relationship to electronic equipment and its potential effect on worldwide electronics.

He will also present the semiconductor industry's position regarding increased Japanese and European competition, the spokesman noted.

Exhibiting companies will include Motorola, Inc., Texas Instruments, Inc., Bendix Corp. and Allen-Bradley Co.

Midcon can be reached at 999 N. Sepulveda Blvd., El Segundo, Calif. 90245.

German CA Gets First Job

IRVINE, Calif. — Computer Automation GmbH, Frankfurt, Germany, a wholly owned subsidiary of Computer Automation, Inc., has negotiated its first major OEM contract with Video Data Systems GmbH.

Valued at $200,000, the order is for LSI 4/10 minicomputers that will be designed into a new graphics terminal system to be used by the German government for an upcoming census.

The creation of the German subsidiary earlier this year was the first step in an international expansion that calls for formation of several subsidiaries to sell and service products of all three of CA's divisions.

Concurrent with establishment of the subsidiary, the company's Naked Mini Division set up a full factory service center in Frankfurt to support its OEM minicomputer business.

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W. Germany	6,527	7.9	3
United Kingdom	4,794	5.8	4
France	4,768	5.8	5
Canada	2,301	2.8	7
Italy	2,119	2.6	8
Australasia	2,044	2.5	9
Brazil	532	.8	17
Middle East	328	.4	22

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The School of Computing Sciences offers undergraduate courses in Computing Science, a post-graduate Diploma in Data Processing, a Masters Degree by Research and Thesis, and will be offering a course work Masters Degree in 1980-81. The School has a number of laboratories including a microprocessor laboratory, and a computing laboratory based on a PRIME 350. Students and staff will have access to the large Honeywell computer network to be installed in the Computer Centre, in 1979.

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Computing Systems is concerned with teaching subjects including Assembler Programming, Operating Systems, Performance Evaluation and Computer Architecture. Information Systems consists mainly of subjects ranging from Introductory Data Processing, Commercial Programming, Data Base Management, Systems Analysis, and Data Processing Management. Business Computing provides "service" courses to the Faculty of Business Studies - mainly Introductory Data Processing and Systems Analysis. Applications are invited for:

> A Senior Lecturer is sought in the area of Information Systems. Applicants should possess a higher degree, have extensive academic or industrial experience and be able to demonstrate initiative in directing research or major projects in Computing.
>
> Lecturers are required in the areas of Computing Systems, Information Systems, or Business Computing. Applicants should have a higher degree and teaching experience at a tertiary level, or extensive industrial experience.

Salaries are in the following ranges:

Senior Lecturer	$A 20,365 - $A 23,737 p.a.
Lecturer	$A 15,179-$A 19,940 p.a.

With consent of Council academic staff are permitted to undertake limited consulting work.

Fares and a contribution toward removal and initial accommodation expenses provided for overseas applicants. A Housing Loan Scheme is also available.

Applications close December 8, 1978. Applicants should arrange for three confidential referee's reports to arrive by the same date. Applications should include: address; phone number; personal particulars; documentary evidence of qualifications; work and teaching experience; affiliations, publications; research work undertaken and the names and addresses of the referees contacted. Applications and referee's reports should be sent to:

The Appointments Officer
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INSTITUTE OF TECHNOLOGY
P.O. Box 123,
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Responsible for hardware coordination, installation planning, site preparation, change control and hardware capacity planning. Reports to the Manager of Computer Operations and requires an individual with broad-based background and exposure in large computer installations. This is a trouble-shooting job and therefore the ability to interface with vendors and technicians as well as varied levels of management is a must. Salary to the low 20's.

Shift Supervisor
Computer Operations

This position requires 5 years of experience in a large batch oriented environment with a minimum of 2 years in supervision. Responsibilities include accountability of our night shift with a staff of 10. Knowledge of IBM 370 hardware is a must, with experience in OS/MVS and VM preferred. Salary in the high teens depending on experience.

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Dept. of Computer Science
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NM(GS)-12

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Responsible for hardware coordination, installation planning, site preparation, change control and hardware capacity planning. Reports to the Manager of Computer Operations and requires an individual with broad-based background and exposure in large computer installations. This is a trouble-shooting job and therefore the ability to interface with vendors and technicians as well as varied levels of management is a must. Salary to the low 20's.

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Computer Operations

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Personnel Administrator
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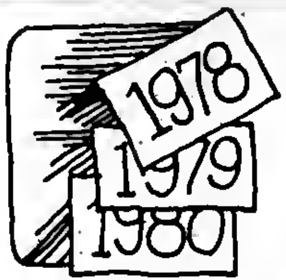

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Minimum of 2 years programming experience in either IBM Assembler language (BAL) or PL1. Experience with DOS/VS, teleprocessing and data base applications a plus.

We offer excellent compensation packages and full company benefits. Please write in strict confidence, stating education, work experience and salary history to:

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Assistant Coordinator, Documentation Services

THE COLUMBIA UNIVERSITY CENTER FOR COMPUTING ACTIVITIES is looking for an Assistant Coordinator of Documentation Services: to perform technical writing, editing, layout and other functions geared toward the preparation of documents, appendices and the Center's bi-weekly Newsletter.

You should have a working knowledge of at least one computing language, a college degree and excellent oral and written skills.

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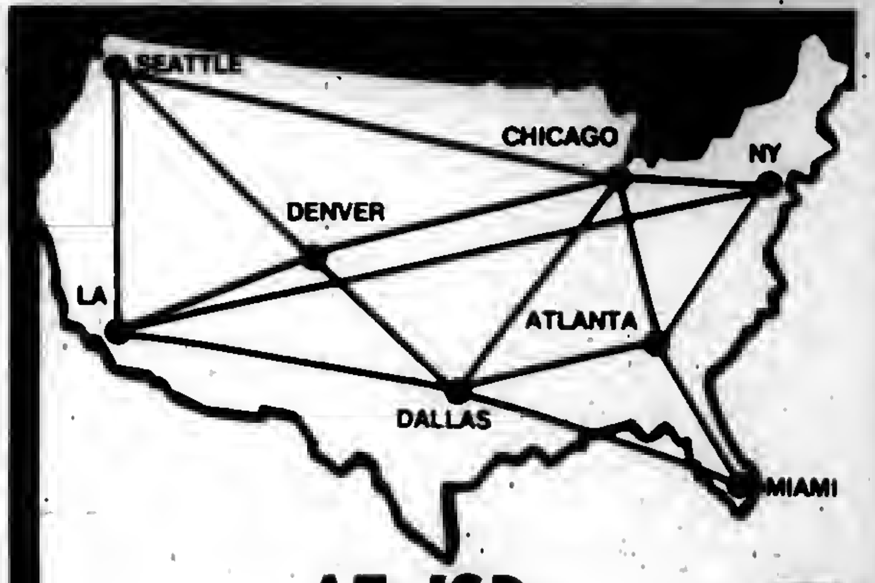

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- BAL Programmer Analysts
- Operations (OS) Specialists
- System Programmers
- Project Leaders
- Operations Supervisors
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- Minicomputer Operating Systems
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For more information, call
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Manager EDP		30K

These are just a sample of the many E.D.P. positions available in N.H. For consideration, send a resume to David J. Osgood, CEC Vice President at:

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Personnel Consultants
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EDP Consultants

Southeastern United States

Major consulting firm located in Atlanta has openings for experienced EDP professionals. Assignments will include but not be limited to equipment and software selection, design and implementation for diverse client base.

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Compensation includes competitive base salary plus bonus and fringe benefits. Success with the firm leads to partnership.

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H - 6080

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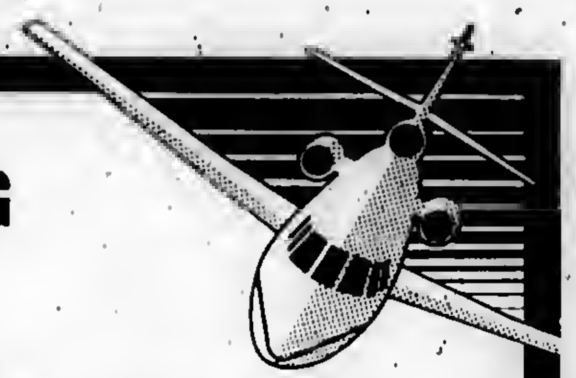

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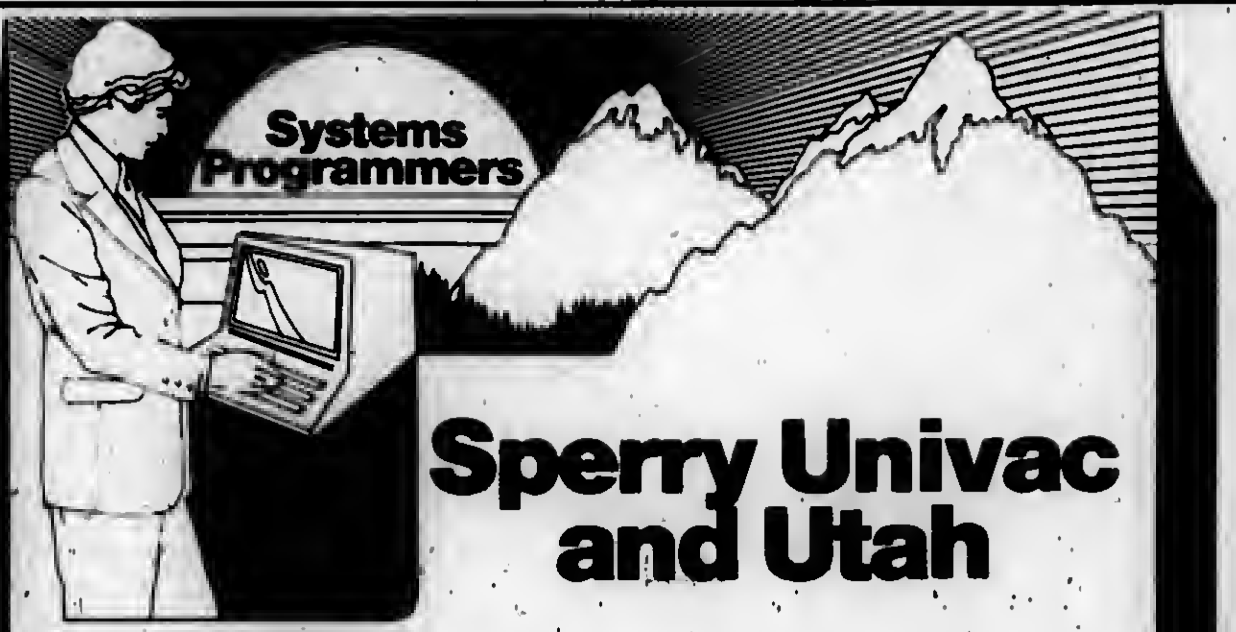

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At least 2 years experience in IBM OS or OS/VS JCL, and COBOL. ALC and Structured programming experience helpful. Manufacturing oriented background preferred. Duties include design, programming and maintenance of common business applications in a software and hardware "leading -edge" shop. Send resume and salary requirement. Personnel Director, Bear Creek Corporation, P.O. Box 712, Medford, Oregon 97501.

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Toll Free Numbers:
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Selected candidates will implement and assist in the coordination of major software installations in the areas of MVS/JES 3, CICS/VS, IMS or Telecommunications.

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Position responsibilities will include developing forecasting tools and techniques and interface with end users for forecast development. Data processing experience with applications programming background and knowledge of large scale systems work load forecasting required. Technical expertise should include knowledge of computer resource utilization and SMF accounting measures.

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Primary responsibilities in hardware monitoring and analysis. Will develop monitoring tools and techniques and assume project leadership for performance related studies. Tesdata MS series experience and knowledge of large scale IBM systems required. BS scientific field and project leadership experience preferred.

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Application Deadline: Nov. 30, 1978. Send resume to: Weld County Personnel, P.O. Box 758, 915 10th St. Greeley, Col. 80631.

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DEC PDP 11/34

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Companies: Honeywell Information Systems, Borden, Marathon Oil Co., Lockheed, The City of Chicago, Sperry Univac, Digital Equipment Corp., Dartmouth College, Princeton University Plasma Physics Laboratory, Data General, Amdahl, Exxon, Gould Instrument Systems Division, Xerox, National Semiconductor, The Chicago Board Options Exchange, ITT Domestic Transmission Systems, Inc., United Brands Co., New England Mutual Life Insurance Co., Greyhound Computer Corp., GenRad, W.R. Grace & Co., Firemen's Fund American Insurance Co., Datapoint Corp., National Bank of Alaska, Schering-Plough Corp., Rockwell International, Massachusetts Institute of Technology, Merrill, Lynch, Pierce, Fenner & Smith, Inc., Booz, Allen & Hamilton, Inc., Levi Strauss & Co., Kawasaki Motors Corp., AMF Harley-Davidson, Winnebago Industries, Crown Zellerbach, University of Illinois, The American Bar Association, Flour Corp., Parke Davis, Tennessee Valley Authority, Westinghouse Computer & Instrumentation Division.

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Richard Kramer
President
Electronic Data Personnel
1006 Grand Avenue
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"The demand for computer people is even stronger now than it was back in the 'go-go' days of the '60s, particularly at the individual contributor level. And *Computrrworld* seems to filter through to these people very well—more so, perhaps, than any other publication we've used.

"I might add that Source EDP has used them all. Since 1962 we've become, with 35 branch offices in the US and Canada, the largest non-franchised recruiting firm in North America that specializes in data processing. I think our continued exposure in *Computrrworld* is one of the factors that has helped us expand to our present level . . .

"Since it's published on a weekly basis, in newspaper format, I think *Computerworld* generates a sense of urgency that simply does not exist in the typical monthly trade magazine. People tend to respond to it much more quickly.

"*Computrrworld* also comes out on top in comparison to the many local media Source EDP uses. In terms of cost per response, *Computerworld* is a great deal cheaper than a local newspaper since the latter has a general audience. In contrast, *Computrrworld* hits our market—the DP professional—right on the button. It also has a tremendous pass-along factor. Some of our ads generate responses for as long as 4 months after publication. Believe me, if *Computrrworld* didn't work for us we wouldn't be in every issue."

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Sealed proposals will be received by the COPA, 508 Robert E. Lee Building, Jackson, MS 39201, for the following data processing equipment and services:

Request for Proposal No. 402 due 3:30 p.m., Wednesday, November 29, 1978, for the acquisition of a source document reader for supplementing the keypunch function at a state university.

Request for Proposal No. 403 due 3:30 p.m., Wednesday, November 29, 1978, for the acquisition of a software product that will enable ASSEMBLY LANGUAGE and/or COBOL programmers to test and debug CICS applications programs in an online environment while protecting CICS itself from errors in the tested program. This software must be capable of running under the MVS operating system on a 370/158.

Request for Proposal No. 404 due 3:30 p.m., Wednesday, November 29, 1978, for the acquisition of sixteen (16) terminal ports for a PDP 11/70.

Request for Proposal No. 405 due 3:30 p.m., Wednesday, November 29, 1978, for the acquisition of two typewriter quality terminals to be used for word processing on a PDP 11/70.

Request for Proposal No. 406 due 3:30 p.m., Tuesday, December 5, 1978, for the acquisition of a computer controlled power management system for a small junior college.

Request for Proposal No. 407 due 3:30 p.m., Tuesday, December 19, 1978, for the purchase of programmable electronic calculator systems to be provided for the State of Mississippi through June, 1979, ranging in price from $1,000 to $15,000.

Request for Proposal No. 408 due 3:30 p.m., Tuesday, December 19, 1978, for the acquisition of ASR and KSR hard copy terminals. This RFP will be used to select terminals for the State of Mississippi through June, 1979.

Request for Proposal No. 409 due 3:30 p.m., Tuesday, December 19, 1978, for the acquisition of TTY compatible CRT terminals. This RFP will be used to select terminals for the State of Mississippi through June, 1979.

Request for Proposal No. 410 due 3:30 p.m., Tuesday, December 19, 1978, for the acquisition of receive-only printer devices. This RFP will be used to select terminals for the State of Mississippi through June, 1979.

Request for Proposal No. 411 due 3:30 p.m., Tuesday, December 19, 1978, for the acquisition of IBM compatible CRT's, controllers, and printers. This RFP will be used to select terminals for the State of Mississippi through June, 1979.

Request for Proposal No. 412 due 3:30 p.m., Tuesday, December 19, 1978, for the acquisition of graphics terminals and related peripherals. This RFP will be used to select graphics equipment for the State of Mississippi through June, 1979.

Request for Proposal No. 413 due 3:30 p.m., Tuesday, December 19, 1978, for the lease or purchase of printing interpreting keypunch-verifiers. This RFP will be used to select keypunch equipment for the State of Mississippi through June, 1979.

Request for Proposal No. 414 due 3:30 p.m., Tuesday, December 19, 1978, for the acquisition of modems and acoustical couplers with speeds ranging from 110 baud to 56K baud for terminal communications with various computer systems used by the State of Mississippi. This RFP will be used to select equipment for the State of Mississippi through June, 1979.

Request for Proposal No. 415 due 3:30 p.m., Tuesday, November 29, 1978 for the sale of an IBM 402 accounting machine.

Detailed specifications may be obtained from the COPA office. The COPA reserves the right to reject any and all bids and proposals and to waive informalities..

Frank C. Stebbins, Executive Director
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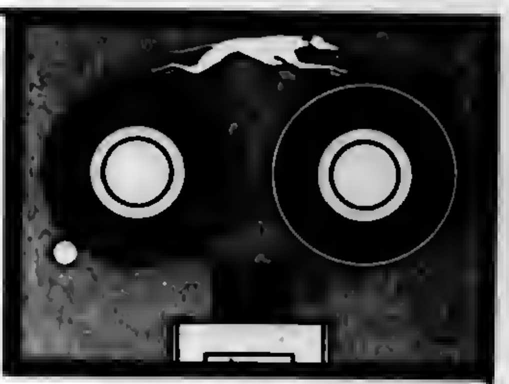

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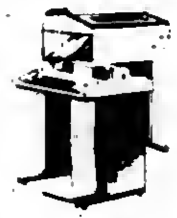

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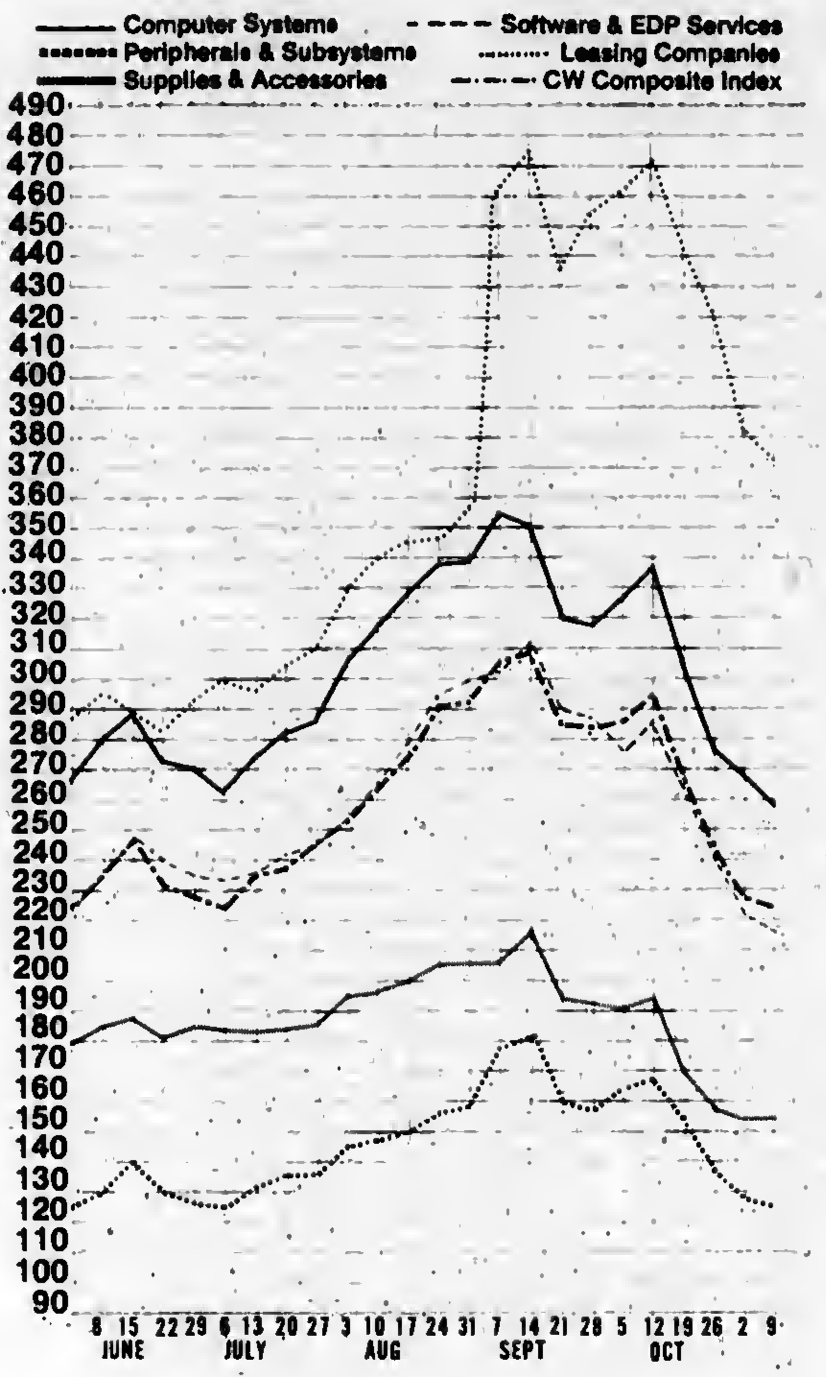

Earnings Reports

ANACOMP
Year Ended June 30

	1978	1977
Shr Ernd	$1.02	e$.86
Revenue	21,616,000	18,183,279
Earnings	1,558,297	1,192,238
3 Mo Shr	.31	a.22
Revenue	5,823,058	3,239,688
Earnings	488,032	316,642

e-Adjusted to reflect 10% stock dividend paid in September 1977 and April 1978.

AUTOMATIC DATA PROCESSING
Year Ended June 30

	1978	1977
Shr Ernd	$1.64	$1.58
Revenue	299,260,000	245,487,000
Earnings	27,407,00	23,308,000
3 Mo Shr	.53	.45
Revenue	81,890,000	64,544,000
Earnings	7,932,000	6,650,000

BOLT BERANEK & NEWMAN
Year Ended June 30

	1978	a1977
Revenue	$30,185,200	$26,573,200
Loss	397,100	916,700
3 Mo Rev	8,511,200	6,077,700
Loss	38,400	1,105,600

a-Restated.

CALIFORNIA COMPUTER
Year Ended June 30

	1978	1977
Shr Ernd	$.45	.....
Revenue	119,971,000	$118,224,000
aSpec Cred	539,000	208,000
Earnings	1,515,000	(1,682,000)

a-From tax-loss carryforward.

COMPUTER INVESTORS GROUP
Three Months Ended June 30

	1978	1977
Shr Ernd	$.48	.....
Revenue	8,531,000	$6,786,000
Spec Cred	a33,000	.....
Earnings	1,051,000	(676,300)

a-Tax-loss carryforward.

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Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES WEDNESDAY, NOVEMBER 8, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1978 RANGE (1)	CLOSE NOV 8 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	45	+ 1/2	+1.1
N	BURROUGHS CORP	39- 67	72 1/8	-2 1/2	-3.3
O	COMPUTER AUTOMATION	15- 44	17	-1	-3.3
N	CONTROL DATA CORP	23- 44	31 3/4	-2 3/8	-6.9
O	CRAY RESEARCH INC	21- 74	26	-27	-50.9
N	DATA GENERAL CORP	42- 71	33 3/8	-4 1/8	-6.9
N	DATAPOINT CORP	34- 73	53 1/2	- 1/4	-0.4
N	DIGITAL EQUIPMENT	39- 34	47 3/4	-2	-4.0
N	ELECTRONIC ASSOC.	2- 13	7 1/8	0	0.0
A	ELECTRONIC ENGINEER.	9- 19	10	- 1/8	-1.2
N	FOUR-PHASE SYSTEMS	19- 46	27 3/8	-1 1/4	-4.3
N	FOXBORO	28- 40	31	-2 1/4	-6.7
O	GENERAL AUTOMATION	7- 24	13 1/2	-1	-6.8
O	GRI COMPUTER CORP	1- 3	1	- 1/8	-11.1
N	HEWLETT-PACKARD CO	62- 93	79 1/2	-3 1/4	-4.1
N	HONEYWELL INC	43- 72	61 1/2	-2 1/8	-3.3
N	IBM	236-305	263 7/8	-10 1/4	-3.7
O	MANAGEMENT ASSIST.	9- 29	17	+1 1/2	+9.6
O	MICRODATA CORP	10- 23	17	+4 7/8	+40.2
O	MINI-COMPUTER SYST	4- 8	4 3/4	- 1/4	-3.0
O	MODULAR COMPUTER SYS	7- 17	8 1/2	-1	-10.5
N	NCR	37- 67	59 1/8	-1 7/8	-3.0
N	PRIME COMPUTER INC	20- 43	28 1/4	+ 3/4	+2.7
N	PERKIN-ELMER	17- 28	23 1/2	+ 1/4	+1.0
N	RAYTHEON CO	29- 58	43 3/8	-1 7/8	-3.9
N	SPERRY RAND	33- 49	42	- 7/8	-2.0
A	SYSTEMS ENG. LABS	11- 24	13 7/8	+ 5/8	+4.7
A	WANG LABS.	12- 32	21	-1 1/4	-5.6

LEASING COMPANIES

EXCH		1978 RANGE (1)	CLOSE NOV 8 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	13- 21	17	+ 1/4	+1.4
O	COMDISCO INC	5- 22	14	-1 1/4	-8.1
A	COMMERCE GROUP CORP	1- 1	3/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	3 3/8	0	0.0
N	DATRONIC RENTAL	1- 3	2 3/8	- 1/8	-5.0
A	DCL INC	3- 3	3 1/4	+ 1/8	+4.0
N	DPF INC	8- 14	10 1/8	+ 1/8	+1.2
N	ITEL	16- 36	24 3/4	-1 1/4	-4.8
N	LEASCO CORP	24- 36	32	-1 1/4	-3.7
O	LEASPAC CORP	1- 4	2 1/2	0	0.0
A	PIONEER TEX CORP	3- 7	3 1/2	- 1/4	-6.6
N	U.S. LEASING	13- 20	13 1/2	- 1/2	-3.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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SOFTWARE & EDP SERVICES

EXCH		1978 RANGE (1)	CLOSE NOV 8 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1	0	0.0
O	ANACOMP INC	8- 22	12 3/8	+ 1/4	+2.0
A	APPLIED DATA RES.	8- 17	9 3/8	- 5/8	-8.0
N	AUTOMATIC DATA PROC	24- 36	29 1/8	-1 3/8	-3.2
O	COLEMAN AMERICAN COS	1- 2	1	- 1/4	-20.0
O	COMPU-SERV NETWORK	6- 12	6	- 3/4	-11.1
O	COMPUTER HORIZONS	1- 9	5 3/4	+ 1/4	+4.3
O	COMPUTER NETWORK	7- 16	7 1/2	- 1/4	-3.2
N	COMPUTER SCIENCES	8- 17	10 1/2	- 3/4	-6.6
O	COMPUTER TASK GROUP	1- 4	3 3/4	0	0.0
O	COMPUTER USAGE	2- 4	2 1/2	0	0.0
O	COMSHARE	6- 19	13 3/4	0	0.0
O	CULLINANE CORP	16- 33	16 3/4	-1	-3.6
O	DATA DIMENSIONS INC	4- 9	3	+ 1/4	+5.2
O	DATATAB	1- 2	1	0	0.0
N	ELECTRONIC DATA SYS.	15- 23	17 3/4	- 3/4	-4.0
O	INSYTE CORP	1- 3	1	+ 1/4	+33.3
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	3	+ 3/8	+8.1
O	KEYDATA CORP	1- 3	1 7/8	- 1/8	-6.2
A	LOGICON	10- 19	10 1/2	-1 3/8	-11.3
O	MANAGEMENT DATA	1- 2	1/8	0	0.0
A	NATIONAL CSS INC	15- 36	22 5/8	-1 3/8	-3.7
O	NATIONAL DATA CORP	7- 13	7 7/8	- 1/2	-3.9
A	ON LINE SYSTEMS INC	16- 30	17 3/4	+ 3/4	+4.4
N	PLANNING RESEARCH	4- 10	6 1/4	- 1/2	-7.4
O	PROGRAMMING & SYS	1- 1	1 3/8	0	0.0
O	RAPIDATA INC	3- 7	4 1/2	+ 1/4	+3.8
O	REYNOLDS & REYNOLD	18- 36	27 1/4	0	0.0
O	SCIENTIFIC COMPUTERS	3- 9	5 3/4	- 1/2	-8.0
O	TYMSHARE INC	18- 35	23 1/2	- 1/2	-2.0
A	URS SYSTEMS	5- 8	6	+ 3/8	+6.8
N	WYLY CORP	1- 7	3 3/4	- 3/8	-14.2

PERIPHERALS & SUBSYSTEMS

EXCH		1978 RANGE (1)	CLOSE NOV 8 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	20 5/8	-2 1/2	-10.8
O	ADVANCED MEMORY SYS	7- 18	12	- 7/8	-6.7
N	AMPEX CORP	10- 19	12 5/8	0	0.0
O	ANDERSON JACOBSON	5- 10	5 1/8	- 3/8	-6.8
N	APPLIED DIG DATA SYS	9- 22	10	- 1/2	-4.7
O	BEEHIVE INT'L	4- 7	3 1/2	- 3/8	-9.6
A	BOLT.BERANEK & NEW	6- 14	9 1/2	0	0.0
N	BUNKER-RAMO	10- 20	12 1/2	- 3/8	-2.9
A	CALCOMP	3- 13	6	+ 1/4	+4.3
O	CAMBRIDGE MEMORIES	3- 9	4 1/8	- 1/4	-5.7
N	CENTRONICS DATA COMP	16- 37	23	+2	+6.6
O	COGNITRONICS	1- 4	1 1/4	0	0.0
O	COMPUTER COMMUN.	6- 12	3 1/2	-1 1/8	-16.9
O	COMPUTER CONSOLES	4- 10	6 1/2	0	0.0
A	COMPUTER EQUIPMENT	3- 6	4 1/8	+ 3/8	+10.0
O	COMPUTER TRANSCEIVER	1- 3	2 3/8	+ 1/4	+10.3
O	CONTEN	9- 38	23 1/2	- 1/4	-1.0
N	CONRAC CORP	14- 26	13 7/8	-1 3/8	-9.0
O	DATA ACCESS SYSTEMS	3- 14	13	+2	+18.1
O	DATA 100	9- 20	19 1/4	+ 1/8	+0.6
A	DATA PRODUCTS CORP	14- 25	13 3/8	- 7/8	-5.3
O	DATUM INC	2- 6	2 7/8	0	0.0
O	DECISION DATA COMPUT.	2- 6	2 1/2	- 3/8	-13.0
O	DELTA DATA SYSTEMS	1- 1	1 3/8	0	0.0
A	DOCUMATION INC	6- 34	19 3/4	+ 1/2	+2.3
O	DATARAM CORP	6- 32	20 1/2	+ 1/2	+2.3
N	ELECTRONIC M & M	4- 9	4 3/8	- 1/2	-10.2
O	FABRI-TEK	1- 2	1 1/8	0	0.0
O	GENERAL COMPUTER SYS	1- 3	1 3/8	- 1/8	-8.3
N	HAZELTINE CORP	10- 17	11 1/4	- 3/4	-6.2
N	HARRIS CORP	17- 36	30 5/8	-1 3/4	-3.4
O	INFOREX INC	6- 11	6 1/4	- 1/8	-1.9
O	INFORMATION INTL INC	7- 12	7 1/4	- 1/4	-3.3
O	INTEL CORP	39- 62	48	- 1/2	-1.0
A	LUNDY ELECTRONICS	4- 8	4 7/8	- 1/8	-2.3
O	MSI DATA CORP	10- 19	11	-1 1/8	-9.2
N	MEMOREX	27- 39	30 3/8	-1 3/8	-3.0
N	MOHAWK DATA SCI	6- 15	7 3/4	- 3/8	-4.6
O	OMEX	2- 6	3 1/2	0	0.0
O	PENRIL CORP	3- 12	9 3/8	- 3/8	-3.7
N	PERTEC CORP	9- 17	11 1/8	+ 3/8	+3.4
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 3/8	0	0.0
O	RECOGNITION EQUIP	7- 13	8 1/2	+1 1/2	+21.4
O	SCAN DATA	1- 5	2 1/4	+ 1/8	+3.8
N	STORAGE TECHNOLOGY	19- 46	24 3/8	-1 3/8	-6.2
O	T BAR INC	11- 20	13 1/4	0	0.0
O	TALLY CORP.	4- 9	3 3/8	+ 1/4	+4.8
A	TEC INC	6- 13	7	- 1/4	-3.4
N	TEKTRONIX INC	33- 30	42 1/2	+ 1/8	+0.2
N	TELEX	3- 9	3 1/8	- 1/2	-8.8
O	TESDATA SYSTEMS CP	9- 23	9 3/4	0	0.0
O	WILTEK INC	1- 2	1 1/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1978 RANGE (1)	CLOSE NOV 8 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	8 1/4	+ 3/8	+4.7
O	BALTIMORE BUS FORMS	2- 4	1	0	0.0
A	BARRY WRIGHT	14- 30	22	- 3/4	-3.2
O	CYBERMATICS INC	1- 1	3/8	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	13	+ 3/4	+5.2
N	ENNIS BUS. FORMS	8- 17	11 1/2	0	0.0
N	3M COMPANY	43- 66	39 3/8	- 1/4	-0.4
O	MOORE CORP LTD	26- 34	29	- 1/2	-1.6
N	NASHUA CORP	18- 37	22 3/4	-2 3/4	-10.7
O	STANDARD REGISTER	20- 27	21 1/4	+ 3/4	+3.6
A	TAB PRODUCTS CO	8- 16	9 1/2	- 1/4	-2.5
N	UARCO	19- 40	39	+5 1/4	+13.5
A	WABASH MAGNETICS	10- 22	14 1/2	- 7/8	-3.6
N	WALLACE BUS FORMS	18- 33	22 7/8	- 3/4	-3.1

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CW Photo by R. Frank

This was the scene on the show floor as Interface West opened in Los Angeles last week. Conference coverage continues on Pages 4 and 5.

Xerox Plans to Offer Network Combining Satellite, Radio Links

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Xerox Corp. announced plans last week for a domestic digital communications network that will use a combination of satellite and radio lines.

The communications system — Xerox Telecommunications Network (Xten) — will be offered by a Xerox subsidiary which would be established if the plan is approved.

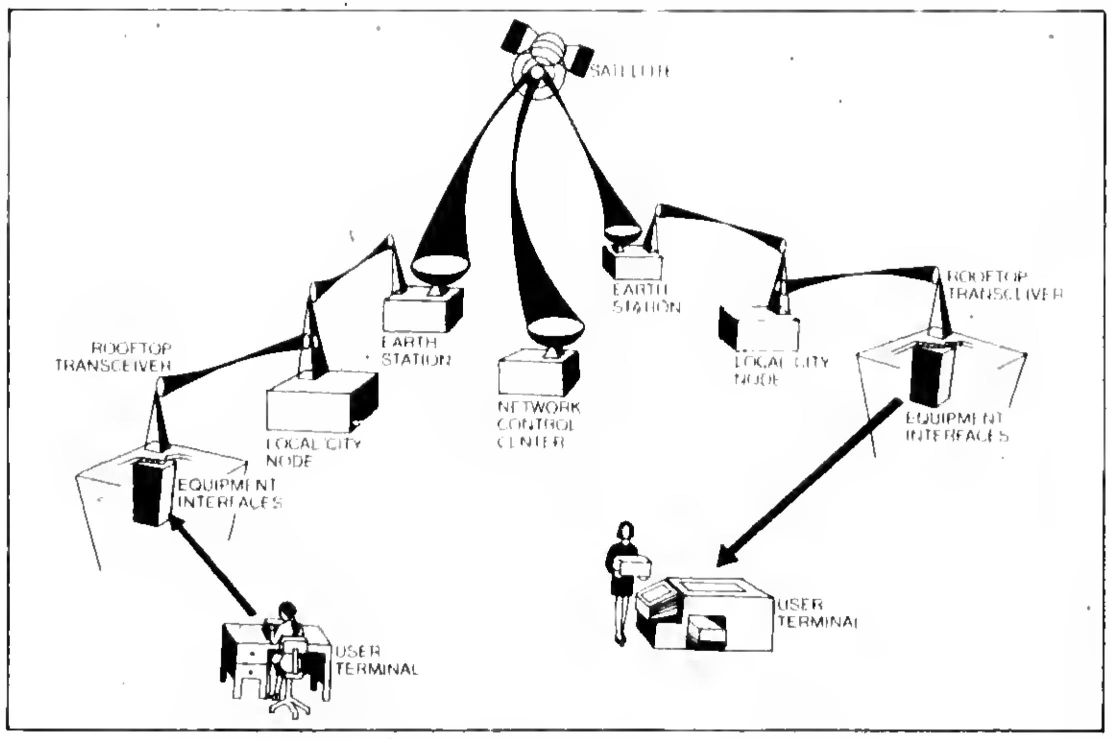
Xerox filed a Petition for Rulemaking with the Federal Communications Commission (FCC) Thursday requesting that a band of radio frequencies be allocated for common carrier electronic message services providing information transmission. Xten would use a portion of the requested band — in the 10GHz range, according to Xerox.

The use of radio links for local communications makes the system unique, sources indicated. The proposal for Satellite Business Systems (SBS), in which IBM is a partner, imagines direct communications through a satellite from one company location to another.

Xten, however, will use the radio links for local distribution while the satellite communications are handled by the city nodes.

At present there are no radio bandwidths allocated to this type of

(Continued on Page 6)



The Proposed Xerox Telecommunications Network

Not Only DPers Guilty Of DP Crime, Expert Warns

By Ronald A. Frank
CW Staff

LOS ANGELES — Computer crime is not the exclusive domain of DP experts; many computer crimes are committed by those who don't know a thing about DP operations, according to Jay J. Becker, director of the National Crime Data Center in the Los Angeles district attorney's office.

In fact, it is not necessary for a person to have access to a DP system in order to compromise it, Becker warned at a session of the Interface West conference here last week.

Because computer crime can originate beyond the boundaries of the DP room, he advised users to pay attention to all facets of a DP operation for potential trouble areas.

It is unfortunate that so much attention is given to computer crime because it implies computerized systems have more of a tendency to be compromised than manual systems, Becker observed, pointing out that there is no hard data to substantiate this premise. It has not been demonstrated that the likelihood of loss is greater with automated systems than with nonautomated systems.

The implementation of a computerized system actually provides the user with the capability to guard against unauthorized loss. In order to achieve this capability, however, the user must anticipate areas where the system is vulnerable. These should include the related areas of telecommunications, personnel and security procedures, Becker said.

Little Sophistication Needed

Some computer crimes are being committed by people with a kindergarten-level of CPU sophistication, Becker said. In one instance an equipment operator printed duplicate paychecks for himself simply by pushing the repeat button on a high-speed printer.

Although examples of this type sound comical, they can cost corporations thousands of dollars, Becker

(Continued on Page 2)

Lack of Women DPers Seen 'Severe Loss'

By Marcy Rosenberg
CW Staff

WASHINGTON, D.C. — The paucity of professional women working in the computer science, general science and engineering fields "represents a severe loss of scientific talent," according to Joan Callanan, manager of the National Science Foundation (NSF) Women in Science Program, which is trying to attract more women into these professions.

The most recent nationwide NSF survey showed that in the computer science area, the number of men employed at or above the systems analyst level far outpaced the number of women.

Seventeen surveys were sent to all graduates from 1970 and onward who received science and engineering degrees. These included 60,000 Ph.Ds: 50,000 in the 1970 labor force plus new entrants for each year up to 1975; and 7,000 graduates each for 1974 and 1975.

The 1976 results indicated that through 1975, 138,700 men vs. 33,600 women were working as systems analysts or in higher DP positions. This showed little change from the previous survey year, which showed 134,900 men and 31,300 women actively employed in those job categories through 1973.

In addition, the most current national figures from the National Center for Education Statistics, published in the July-August 1978 *Scientific Technical Manpower Comments,* showed that as of 1976, more men were studying computer science at all degree levels.

The breakdown for total numbers of degrees conferred in computer and information sciences from 1970-1976 showed that out of 25,555 B.S. degrees, 16.8% went to women. Women received 12.6% of the 12,856 M.S. degrees and were granted 6.6% of the 1,146 Ph.Ds awarded.

(Continued on Page 8)

Unfair Competition?

By Ronald A. Frank
CW Staff

STAMFORD, Conn. — Can an automated terminal provide unfair competition to humans? That is the issue raised in a suit filed by the First Stamford Bank and Trust Co. against four local banks that operate automated teller machines (ATM).

The ATMs provide banking services to customers seven days a week. Norman Reader, president of First Stamford, thinks the seventh day constitutes unfair competition for his bank.

The origin of Reader's complaint is a Sunday closing law, passed by the Connecticut Legislature in its last session, that prohibits banks from operating on Sundays.

First Stamford has no ATMs, so Reader believes his bank is at a disadvantage. Under the law, it cannot hire tellers to serve customers on

(Continued on Page 4)

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Man Held Overnight

Old File Blamed for Near-Arrest

By Tim Scannell
CW Staff

TEMPE, Ariz. — A Nevada businessman recently stopped by police here for a traffic violation was nearly charged with out-of-state grand theft because of outdated information in the National Crime Information Center's (NCIC) computer.

James Culverwell was detained by local police about three weeks ago for failing to dim his automobile headlights. He was subsequently arrested and charged for another "minor" violation, according to a police spokesman.

When the Tempe police delivered their suspect to the station, a routine check with the NCIC network revealed a warrant had been issued for Culverwell and he was wanted in Stockton, Calif., for grand theft. Culverwell, however, maintained the computer was wrong and he was innocent.

Culverwell spent the night in the Tempe jail and was transferred the next morning to the Maricopa County Sheriff's Office, which handles all felonies and extraditions. He was released about 11 p.m. that night, after it was discovered that the computerized record detailing his warrant was not only wrong, but more than six months old, according to Steve Rempe, Culverwell's lawyer.

"The Tempe police just technically followed what was in the computer," Rempe explained. "They haven't been sued enough where it's gotten to the pocketbook of the city . . . so they generally rely on the word of the computer rather than the guy they're arresting."

Culverwell's NCIC file originated earlier this year, when a man in California filed theft charges against him following the repossession of a trailer purchased from Culverwell's company, Rempe said. The charges were dismissed in court, but the incident was apparently never purged from the NCIC data base.

System Defended

According to Harry Balian, a detective with Maricopa County's Fugitive Division, the police department that issued the original warrant has the responsibility of purging it from NCIC files. "As soon as we found out there was some sort of mix-up, naturally, we let Culverwell out of custody," Balian stated.

Although Rempe believes the NCIC system has more than its share of mistaken "hits," Balian, who works directly with the computerized files, thinks the system is basically good. "But every once in a while something [wrong] will occur," he admitted.

Maricopa County police officers have to operate within a strict set of guidelines and every arrest is carefully scrutinized for errors. "Nobody needs false arrest suits because all they're doing is costing the taxpayers money when that money can go to something useful," Balian pointed out.

The only problem with the system, he said, is that some police departments enter warrants and then refuse to extradite the wanted person once he is caught because of the cost involved in transferring a prisoner from one state to another. "Usually a state will reduce the charge to 'in-state-only' pick-up and avoid the extradition process," Balian said.

All DP Criminals Not DPers

(Continued from Page 1)

noted. He cited schemes in which accounts were rounded to deduct five cents, and the perpetrators amassed huge amounts without attracting much attention to any single account.

In one case, a bank depositor had deposit slips imprinted with a microcode of his account, then placed them at the customer desks. Unwary depositors filled out deposit authorizations that channeled their money into the culprit's account. This was done with valid signatures from each depositor.

The implementation of distributed DP concepts provide the user with an opportunity to take a close look at existing systems "to see where holes can be plugged up," Becker said. Users should ask themselves, "What if someone wants to steal from the system?" then anticipate how it could be done.

Until now perpetrators of computer crimes have compiled a fairly dismal record of light sentences. The National Computer Crime Data Center is meant to be a place where investigators and law enforcement agencies can get data on the methods involved in these crimes, Becker explained. With wider dissemination of computer crime information, it is hoped the odds will change and more convictions for these crimes will result, Becker said.

Many of these crimes presently go unreported, and the center may make it easier for companies to identify how crime has been committed.

Computer crime is still in its early stages, Becker said, identifying as new areas the international arena and the tampering of automated accounts.

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LANDSLIDE

The results are already in for the Great Sorting Election of 1978!

(54% vote for Syncsort OS, only 36% for IBM 's "top" sort.)

Call (201) 568-9700.

Ask for a copy of the latest "sort census."

Ah, we can almost see and hear it now! It is Election Night, and there is Good Old Reliable Walter, sitting exactly where you'd expect him to be—at the anchor desk in Election Headquarters. Suddenly he fiddles with that thing he wears in his ear, listens intently and says:

"Ladies and Gentlemen, we now have a winner in that OS sort-program race that has aroused so much interest across the nation. We predict that SyncSort will be re-elected handily with an impressive 54% of the vote.

"Trailing badly is the handpicked candidate of the powerful IBM Machine—SM1-5740, Release 3. Despite the fact the other IBM entries—SM1-5734 and SMO23—threw their weight behind Release 3, IBM's top-of-the-ticket candidate garnered only 36% of the vote.

"Will this be the last hurrah for that silver-haired, florid-faced sort known in so many of the nation's club houses as 'ICEMAN 3?' To find out, we take you now to the losing candidate's headquarters in beautiful downtown Armonk. . ."

Sorry, Walter, but we've known about these results for weeks now. Because this year, as in 1977, we commissioned those redoubtable poll-takers, the International Data Corporation, to find out for us.

They conducted a telephone survey to find out who uses what sort. The results—together with those for last year—are shown below:

SORTS USED BY OS & OS/VS USERS IN THE UNITED STATES

	July 1, 1977		July 1, 1978	
Sort Name	No. of Systems	%	No. of Systems	%
SyncSort	1,333	43%	1,836	54%
SM1-5740 (IBM)	992	32	1,224	36
SM1-5734/SM023 (IBM)	651	21	204	6
Other	124	4	136	4
	3,100	100%	3,400	100%

If you'll call, we'll be glad to send you a copy of the full report. It contains some interesting information on how data processors migrate from those venerable old IBM graybeards—SM1-5734 and SMO23—to SM1-5740, Release 3 and, eventually, to SyncSort.

The reason is not hard to find. Data processors are becoming increasingly aware of inflated "sorting taxes"—overuse of CPU Time, Elapsed Time and the other valuable computer resources that go into sorting. Show them a sort that does more work for fewer resources, and they'll vote for it.

Quicker than you can say "Proposition 13."

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Communications Seen Tying Corporate Tasks

CW at Interface

By Ronald A. Frank
CW Staff

LOS ANGELES — Telecommunications is pulling together operations that are now separate within the average company, according to William C. Brasuell, manager of worldwide telecommunications at Fairchild Camera & Instrument Co.

Speaking at a session on emerging technologies at the Interface West Conference here last week, Brasuell said telecommunications is a weapon in a company's arsenal and is becoming a tool for many firms to combine communications and information transfer needs.

Telecommunications can be broken down according to existing technologies, merging technologies and emerging technologies, and things are moving very fast with continuing equipment improvements, he told attendees.

Self-Contained Functions

Existing technologies include operations which now are primarily self-contained functions within the business environment. These include TWX/telex, store-and-forward message-switching, facsimile, copying, optical character recognition (OCR), word processing, calculator, minicomputer and voice functions.

The first attempts at consolidating these functions have included the addition of communications capabilities to word processing systems, the combination of TWX/Telex, private line and dial up facilities into one terminal; and the computer based PBXs. In the latter category Brasuell included systems from Danyray, Northern Telecom Ltd. and Rolm Corp. and the Dimension series from Bell.

Thus far functions have been combined in equipment that is being utilized for multiple operations. But the real promise lies ahead, in the area of emerging technologies, Brasuell said.

One device that will be avaialble in the future is the total office unit, which will include distributed processing, data input and inquiry, word processing, TWX/Telex and mainframe computing operations, Brasuell predicted.

There will also be high-speed 5- to 10 sec facsimile devides with store-and-forward capabilities. Units are already available that will digitize an average page into 50K bits, and at 9,600 bit/sec this information can be transmitted at the rate of about 5 sec/page.

Even at the slower, more common dial-up speed of 4,800 bit/sec, a page can be transmitted in 10 sec, he explained.

Communications for Copiers

Communications capabilities will be added to copiers so duplicated information can be transmitted immediately, Brasuell forecast. This may lead to some combination of the copying and facsimile functions.

Total PBX switches are on the way that will do much more than handle traffic as it occurs. Typical of this trend, he noted, is the feature introduced by Danray that allows messages to be stored and called up when a person is ready to receive the information.

Store-and-forward facsimile machines will be introduced by 1979 and these will eventually communicate directly with mainframes in the DP center, Brasuell predicted.

It is important to enable communicating word processors to transmit with standard communications routines and protocols so they can interact with other communications systems. Until now many of these systems have been unnecessarily hampered by nonstandard protocols that limit their flexibility, he said.

It will become possible to store a document on a mainframe instead of restricting it to the word processing environment, Brasuell said. Some companies now use their CPUs to print documents prepared on word processing systems.

When this link is implemented, it is possible to print information at 12,000 line/min on a CPU output printer instead of having to live with the 30 char./sec capability of the word processing system.

Upward Pressure

As these functions merge, Brasuell said, upward pressure on corporate communications costs will be created. If properly managed, these costs will rise in a controlled manner.

The benefits of the combined functions should be evaluated by considering what other operations will be eliminated, he suggested. Some combined operations will limit the amount of travel that is now required or inventories may be reduced when faster recordkeeping is instituted.

One problem faced by companies which combine their telecommunications is determining who will manage the operations. Companies have not yet decided where to put this responsibility, but it tends "to collect under management information systems departments," he observed.

DP personnel are taking over this area because they seem to be closer to the technologies, but this pattern is by no means established.

In any case, telecommunications is a valuable corporate resource that must be managed in the right balance, and firms should get enough facilities to adequately perform the functions that are needed. Regardless of who ultimately manages the emerging operations, this area will take on increasing importance within most companies, Brasuell concluded.

Suit Asks Whether ATMs Offer Unfair Competition

(Continued from Page 1)

Sunday, but other banks can provide service by means of the ATMs.

In filing suit against four large banks, Reader is not asking for damages; he said he merely wants the machines to obey the same laws with which humans must comply. In order for the ATMs to operate on Sunday, Reader believes, people must be working at the defendants banks" at DP centers or be available in case the machines malfunction.

Both of these job types violate the Sunday closing law; more importantly, however, they allow his competitors to operate while he must keep his human tellers home, Reader said.

First Stamford had been operating one of its branches for three hours on Sunday mornings with good customer response. When the Sunday closing law took effect Oct. 1, these operations had to be suspended.

Injunction Sought

"We are seeking a temporary injunction against the other banks" to keep them from operating on Sunday, according to First Stamford attorney Joseph Zone. A permanent injunction will be sought to prohibit any Sunday operations until the main issue in the case is resolved, he added.

While the suit was filed against four specific banks as a practical matter, an injunction by the Fairfield County Superior Court would close all banks on Sundays. It is unlikely that a bank not named in the suit would attempt to operate if an injunction were issued, Zone said.

Asked if changing the Sunday closing law to exempt banks would be a possible solution, both Zone and Reader agreed this would take the anti-competitive aspects out of the situation. Thus far, however, Reader has taken no steps to ask for such an amendment.

ATMs Not Personalized

First Stamford does not have ATMs because human tellers can provide more personalized service, Reader said. One of the smaller banks in the Stamford area, it cannot install ATMs on a large scale like some of its competitors, according to Zone.

The charges and request for an injunction will be heard today in Stamford. An attorney representing the defendant banks said last week he had not yet met with his clients to form a position regarding the First Stamford suit.

Named as defendants were the Hartford National Bank, Union Trust Co., State National Bank & Trust of Stamford and Connecticut National Bank of Bridgeport.

None in Operation

A spokesman at Hartford National, attorney Ray Guenter, said his bank had not operated ATMs in the area since early this year and he believes Hartford National will be separated from the suit. "We only had one [ATM] and that has been out of operation since February," he said.

A spokeswoman at Union Trust said that bank would have no comment on the suit "until our lawyers look at it."

One banking source said the suit appears to be aimed at clarifying the Sunday closing law as it relates to banks, rather than raising issues relating to machines vs. humans.

Banks that operate teller terminals generally find that weekends are heavy use times, when customers caught short of cash make use of the ATMs. A legal ruling that prohibits all Sunday ATM operations might be interpreted as causing a hardship for such customers, according to one legal source.

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Show Sees Few Introductions

Dataspeed Upgrades, Fiber Optics Highlighted

By Ronald A. Frank
CW Staff

LOS ANGELES — Upgrades to AT&T's Dataspeed 40 terminal series and fiber-optic digital data links for local-loop applications highlighted the product introductions as the second annual Interface West conference opened here last week.

The products were among the few introductions made by the 101 exhibitors which occupied 180 booths at the show, attracting about 6,000 people during its three-day run.

Canoga Data Systems of Canoga Park, Calif. introduced its CRS-100 digital data link, which is RS-232-compatible and can handle speeds up to 56K bit/sec. The unit was demonstrated transmitting a message at 9,600 bit/sec from a Heath Co. microcomputer to a CRT over a one kilometer spool of fiber-optic cable.

The CRS-100 costs $625 for a stand-alone version; rack-mounted versions are also available. A unit is required at each end of a point-to-point asynchronous data link.

Valtec Corp. demonstrated a similar link that transmitted data between two CRTs. The RSK-D1 link operated at 9,600 bit/sec in full-duplex mode. The RS-232-compatible device is priced at $600 from the W. Boylston, Mass., vendor.

Three Dataspeed Additions

The AT&T booth featured three additions to the Dataspeed 40 terminals series - a dial-up, single-station version of the Dataspeed 40/4 CRT, a receive-only printer for synchronous applications and a forms access printer.

The dial-up version of the 40/4 can operate at 1,200-, 2,400- or 4,800 bit/sec using Ascii or Ebcdic code. It will be provided for about $180/mo with an estimated one-time installation charge of $235.

The terminal was demonstrated operating on-line to an IBM 370/168 mainframe running under CICS at the AT&T corporate computer center in Piscataway, N.J.

Receive-Only Printer

The receive-only printer was designed for remote batch applications using point-to-point dial-up or private-line facilities. It is compatible with Dataspeed systems operating at speeds up to 7,200 bit/sec and can operate with systems using IBM 3770, 2780, 3770 and 3780 binary synchronous protocols, AT&T said.

The unit will be priced at about $225/mo with a $190 installation fee for an 80-column version and at about $265/mo with a $220 installation fee for a 132-column model.

The forms access printer generates tickets, receipts and policies utilizing a tractor-feed mechanism. It operates at 300 line/min and handles multipart forms. The unit will cost about $160/mo with a $165 installation fee.

Initial tariffs for the three Dataspeed devices will be filed in the first quarter of 1979, AT&T said.

HP Emulator

Hewlett-Packard Co. introduced an asynchronous terminal emulator software package that allows its System 45 desktop CPU series to transmit data to larger mainframes. With the emulator, the HP 9835 and 9845 act like a teletypewriter operating in interactive mode with a mainframe.

The emulator package includes three programs written in Basic and a binary program which operates with the I/O read-only memory in the desktop systems. The software costs $300.

Using the terminal emulator package, the 9835 and 9845 CPUs have been interfaced to the Digital Equipment Corp. Decsystem-10 and the HP System 1000 and System 3000. The software will operate with any asynchronous CPU, according to an HP spokesman.

CW at Interface

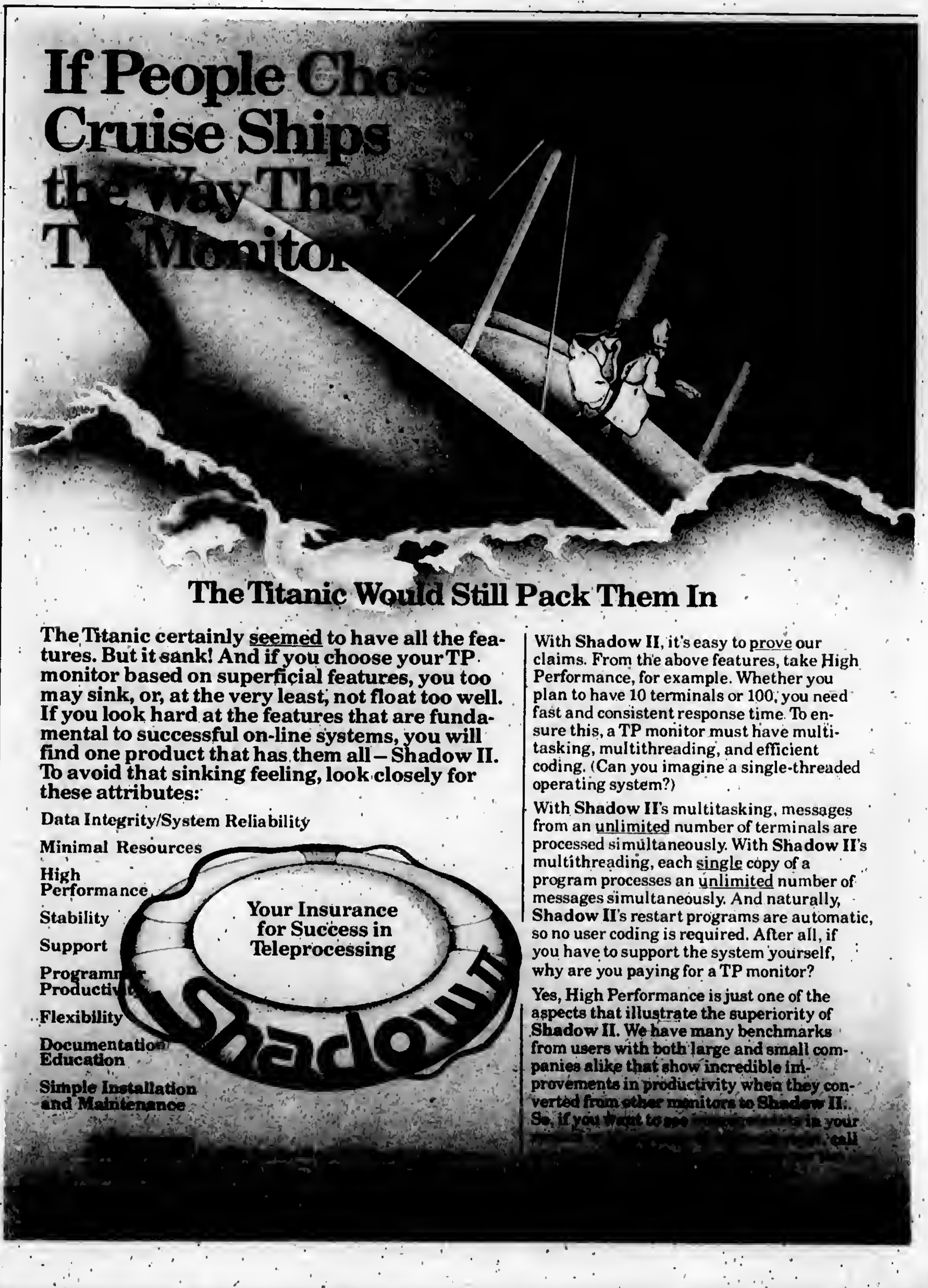
RCA Service Co. added a CRT to its Zentec terminal line. The terminal offers microprocessor control and a 1,920-character CRT screen capacity.

The terminal has dual I/O ports and can accept downline loading of programs from a host CPU.

The unit will be priced at about $115/mo with service, a spokesman said.

Disc/310 Corp., a systems house specializing in Data General Corp. and DEC software, introduced a data base management system (DBMS) that is said to allow users to dynamically create and modify files, screen formats, menus and output reports without changing applications programs.

The DBMS was designed for material requirements planning, production control, engineering change orders and similar applications. The turnkey price for implementation of the system on DG hardware ranges from $50,000 to $500,000 depending on features. Disc/310 is located in Santa Monica, Calif.



The Titanic Would Still Pack Them In

The Titanic certainly seemed to have all the features. But it sank! And if you choose your TP monitor based on superficial features, you too may sink, or, at the very least, not float too well. If you look hard at the features that are fundamental to successful on-line systems, you will find one product that has them all – Shadow II. To avoid that sinking feeling, look closely for these attributes:

Data Integrity/System Reliability
Minimal Resources
High Performance
Stability
Support
Programm
Productiv
Flexibility
Documentatio
Education
Simple Installation and Maintenance

With Shadow II, it's easy to prove our claims. From the above features, take High Performance, for example. Whether you plan to have 10 terminals or 100, you need fast and consistent response time. To ensure this, a TP monitor must have multitasking, multithreading, and efficient coding. (Can you imagine a single-threaded operating system?)

With Shadow II's multitasking, messages from an unlimited number of terminals are processed simultaneously. With Shadow II's multithreading, each single copy of a program processes an unlimited number of messages simultaneously. And naturally, Shadow II's restart programs are automatic, so no user coding is required. After all, if you have to support the system yourself, why are you paying for a TP monitor?

Yes, High Performance is just one of the aspects that illustrate the superiority of Shadow II. We have many benchmarks from users with both large and small companies alike that show incredible improvements in productivity when they converted from other monitors to Shadow II. So, if you want to see [illegible] in your [illegible] call

Six Months Later, College's Boards Still Missing

By Don Leavitt
CW Staff

NEW YORK — Data processing at Herbert H. Lehman College ground to a halt last spring when vandals made off with many of the printed circuit boards from inside the school's IBM 360/40, its control units and peripherals [CW, May 15].

Despite pleas made through *Computerworld* and other publications, none of the boards have been recovered. The two detectives who were working on the case in the spring have been reassigned to other duties and the case, while not officially closed, is no longer being actively worked on.

The old system is dead; it would have cost too much to try to restore all the missing boards from the essentially obsolete equipment, according to Lehman's DP manager, Susan Kliavkoff.

The college's data center, however, is far from dead. Lehman limped by for a while by working at a backup site, then got back in full stride after officials at the central computer installation for the City University of New York — of which Lehman is a part — found a "very similar" machine already owned by the city but considered surplus.

The "new old system" was moved into the college's data center — in a single-story building near campus police headquarters — and operations are back to normal. Security "has been reevaluated and improved," Kliavkoff said, although she was unwilling to go into details on the improvements.

Kliavkoff had been both concerned and upset by the break-in and destruction of the 360/40: "You read about things like this happening, but it's always to someone else. And then, then it happens to you. With no apparent motive."

Overwhelming Response

But she was much happier talking about the aftermath. The initial backup operation worked quite well, though not as conveniently as having the equipment right on campus.

It was the responses — phone calls and letters — she got after the story was published that really got to her. "They were marvelous — so many from [CW's] readers and not all from near here. Offers to help if they could or just to let us know they cared. It was truly heartwarming," she said.

Meanwhile, the case is still open at the Bronx Burglary Squad. Det. Donald MacNaulty, who originally alerted CW to the situation, is still nominally in charge of the case, but he has been transferred to a homicide unit. Det. William Larkin, who worked with MacNaulty, has also been shifted to what one of his fellow officers described simply as a "sex squad."

Neither MacNaulty nor Larkin were available for comment, but a spokesman for the burglary squad said he "remembered" the case and that if any phone calls came in about it, they would be referred to MacNaulty.

Net to Combine Satellites, Radio Links

(Continued from Page 1)

service, Xerox said. That is why the firm has asked the FCC for a ruling on this part of the proposal before it files detailed tariffs or plans for the service.

The planned network will eventually be nationwide, employing "leased satellite capacity integrated with unique customer radio lines." Xten will permit the transmission not only of computer-to-computer digital information but, because of the wide bandwidth, "high-quality graphic information as well," the company said.

Transmission rates will range up to 250K bit/sec, Xerox said, but added it had not yet chosen a supplier from which to lease its satellite circuits.

Depending on the FCC approval process, the Xerox service could be initiated in selected U.S. cities by late 1981, the firm said, and eventually be extended to some 200 metropolitan areas.

Xerox predicted the full 200-city system could be up and running five to seven years after first operations begin.

Xerox said its planned network is directed at three categories of business communications: Document distribution, data transmission and teleconferencing.

According to Xerox's plan, the service will provide terminal compatibility and data encryption functions at the user locations. Transceivers will be located on the user premises, linked to rooftop antennae. From there signals will be transmitted by radio link to a network "subnode."

The subnodes will serve as repeater links between user sites and city nodes located in major metropolitan areas where computers would execute store-and-forward, priority control, multiple address, delivery acknowledgment and other systems functions. The outgoing message would proceed from the city nodes to satellite earth stations.

The network will use leased satellite transponders to complete the connections among the 200 metropolitan areas the final system will encompass, according to the Xerox blueprint.

In differentiating the system from the planned SBS system, Xerox said the SBS offering is aimed mainly at the very largest companies in the nation, which could afford rooftop antennae for satellite communications at all their locations.

The cheaper antennae and ancillary equipment for the planned Xten offering, it indicated, will be aimed at the large number of medium-sized firms which cannot afford the SBS-type of service.

Xerox said it has targeted as potential users the 823 companies in the U.S. that operate from more than three locations.

The plan also calls for two network control centers which, besides performing monitoring and control functions, will store messages for subsequent retrieval by Xten customers.

The primary benefit to the consumer, Xerox said, will be in low operating costs resulting from "the unique use of radio links to eliminate the costly delays and quality loss resulting from routine data over voice telephone circuits or the even more costly alternative of installing individual earth stations or private cable circuits to handle data."

Each of the major earth stations will have either 5- or 10-meter antennae costing between $300,000 and $500,000, according to William Combs, vice-president for marketing for Xten services.

Altogether, he predicted, these stations, with all their associated computer and ancillary equipment, will cost "upward of a couple of million dollars each."

The rooftop antennae, however, will be priced only in the "thousands of dollars range," he said, adding that they will be designed for very low power consumption and be fully solid-state.

Even though the service has been in the planning stage for "well over a year now," no proposed cost figures for typical applications were available from Xerox last week.

The service is a "normal extension of our business products," Combs said. "The office of the future is going to have a lot more communications."

He predicted that manufacturers will develop a completely new line of document processors to take advantage of this type of service.

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Fears Data Won't Be Guarded

Credit Reporter Files to Quash FTC Subpoena

By Tim Scannell
CW Staff

DALLAS — The Chilton Corp., one of the nation's leading consumer credit reporting firms, has filed a motion to quash or limit a subpoena recently served by the Federal Trade Commission (FTC) as part of a major investigation into the computerized credit reporting industry.

The subpoena, served earlier this year, calls for the release of virtually every document and computer program in Chilton's automated system — including proprietary trade data — with no assurances of confidentiality, according to James Sutton, the firm's secretary and corporate counsel.

Compliance with the FTC order would not only jeopardize Chilton's competetive edge in the industry, Sutton claimed, but would also place an "oppressive burden" on the firm's employees, who would be required to gather the subpoenaed data.

The FTC initiated an investigation in late 1976 to determine whether credit reporting firms were complying with the Fair Credit Reporting Act and taking reasonable procedures to ensure the accuracy of their files. The "nonpublic" study originally involved just TRW Credit Data [CW, Sept. 13, 1976], but was recently expanded to include the Chilton Corp. as well as Associated Credit Services, Inc., Credit Bureau, Inc. and Trans Union Systems Corp.

No Acceptable Security

Chilton Corp., which processes an average 16 million credit files per year, has been negotiating with FTC officials since July to reduce the subpoena's extent to a "reasonable level," Sutton said. The firm has also asked the FTC to establish standards of confidentiality to protect the proprietary nature of the records and programs.

However, the commission has failed to institute any "acceptable" security guidelines and the FTC has repeatedly refused to offer any "exact or direct" reason for requesting the credit reporting information, he added.

The FTC did propose that Chilton's records be stored in a Washington, D.C., depository outside the FTC's offices, Sutton continued. If they were, the privileged material couldn't be accessed under a Freedom of Information Act request because it wouldn't be in the agency's possession.

However, since FTC staff members would have access to the depository and, consequently, take notes during the course of the investigation, the notes would be available under the Freedom of Information Act, he pointed out.

Chilton Corp. also asked the FTC for a "predetermination" that all of the information delivered under the subpoena be classified as trade secret data and be exempt from Freedom of Information Act restrictions. "The merge and purge and display rules and algorithms we use in the computer system are part of what the FTC wants," Sutton said.

However, the FTC reportedly refused to agree to any of Chilton Corp.'s security demands.

When contacted, an FTC spokesman refused to comment on the investigation, but said an agency commission would decide how to handle Chilton's refusal to obey the subpoena. The commission could either narrow the scope of the writ, relieve Chilton from complying or render the subpoena ineffective, according to David Federbush, an FTC staff attorney.

Two years ago, TRW Credit Data filed a motion to quash or limit a subpoena served by the FTC that requested the same type of information. Federbush refused to comment on either the success or failure of that action.

Part of the reason Chilton Corp. and the three other credit reporting organizations may be involved in the study is because of TRW's earlier complaints about the FTC examining its records, Sutton believes: "When they [TRW] first got the subpoena. . .they argued that the FTC shouldn't be investigating just them."

TRW insisted that its standards of accuracy be measured against those of the other vendors as well, Sutton said, "but that's not from the FTC, because [staff members] wouldn't tell us why they were investigating us either."

Prepared to Fight

Meanwhile, J.E.R. Chilton III, Chilton Corp.'s chairman of the board, said he is prepared to fight the subpoena and the FTC's request all the way to court. In a recent letter to Chilton Corp.'s shareholders, Chilton noted that the size and operating procedures of the company, in relation to others, makes it unfeasible to submit to the FTC's demands.

"Having exhausted all means of reasonable accommodation, we have been given no alternative but to guard the competitive heart of [Chilton Corp.'s] system," Chilton stated. "Should the commission refuse to limit or quash the subpoena, that subpoena must be enforced through a federal district court and, in that arena, we feel reason will prevail."

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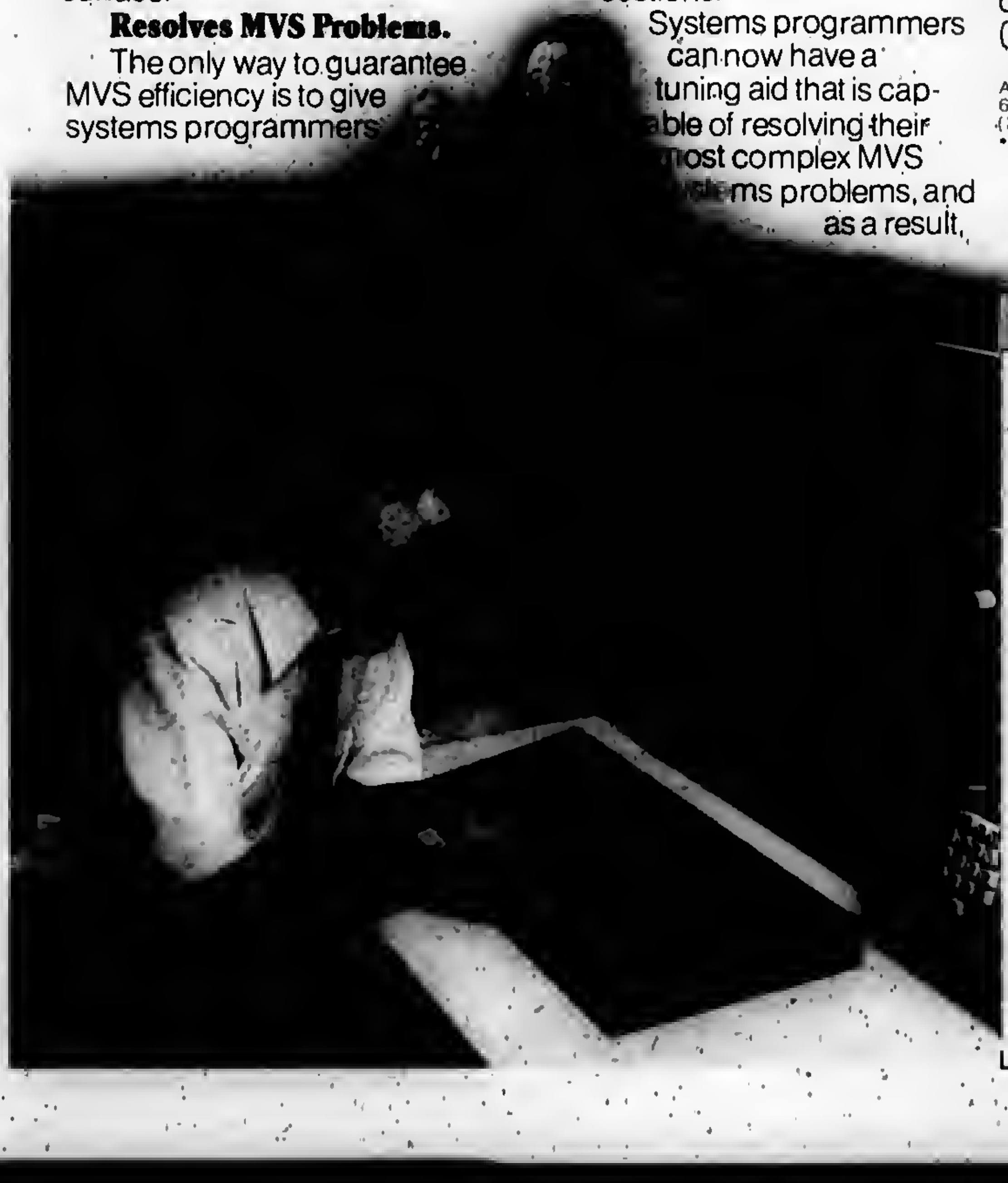

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Career Conference for Women Set for March

By a CW Staff Writer

ALBUQUERQUE, N.M. — The University of New Mexico, which will hold a National Science Foundation (NSF)-funded career conference for women here March 3-4, applied for the NSF grant because it felt women do not get adequate vocational counseling, according to Nancy Martin, the university's Women in Science project director and associate professor in its Computing and Information Sciences Department.

Even though New Mexico has passed the Equal Rights Amendment, "the state is a good five years behind the East Coast in realizing the potentials of women," Martin said.

About 150 professional women scientists have been lined up so far to speak at the conference, which will include three computer science workshops:

One workshop will discuss the educational requirements for computer science careers and the preparation needed for entering such academic programs. Another will outline career opportunities in the field including the national distribution of jobs, salary ranges and potential for promotions.

The third will provide in-depth discussions by women professionals in computer science about some of their on-the-job projects and the state of the art in their specialties.

Scheduled Speakers

Among the speakers will be "a large number of applications programmers, a few Ph.Ds specializing in symbolic processing, artificial intelligence and numerical analysis and at least two women working as systems programmers," Martin noted.

Asked why professional speakers at the conference are mostly — if not all — women, Martin said the conference is for college freshmen and sophomores, and women at this educational level "would feel less inhibited in an all-female environment.

"Many, especially in a state like New Mexico, have questions like, 'What will entering these kinds of careers do to my femininity?' "

Science Aptitude

The $10,000 NSF grant funding this conference will admit 200 female freshmen and sophomores who demonstrate an interest in and aptitude for science. Martin said the university is using as criteria a general-interest questionnaire and past science and math courses taken.

Once accepted, the students must attend all workshops; a $3 registration fee covers refreshments.

While the workshops are geared toward college students, Martin hopes to spin off a university-funded organization to provide similar services and conferences for a broader base of women on a continual basis.

"We would like to get a network of professional women scientists to form an executive committee comprised of one representative from every company and university we can locate in the state to distribute scientific career information to other women in their organizations," she said.

Lack of Women in DP Seen Serious Loss

(Continued from Page 1)

Why are the scales so unbalanced? "There is the equity argument," Callanan said. "There may have been forces in the past that have militated against women studying or participating in scientific careers."

One such force, she noted, "has been sex role socialization that says certain careers are appropriate for men, others for women. Sciences and engineering have traditionally been thought of as male domains.

"There may have been overt or covert job discrimination against women," she added, "but this is not as prevalent as it used to be. I think it's now more a matter of tradition."

Science Career Workshops

The NSF Women in Science Program is designed to increase the number of women in computer science, engineering and other science professions. The program awarded a total of $244,260 in 25 grants to 23 colleges and universities in 17 states for science career workshops for women.

The 25 NSF-funded workshops were mandated not only to motivate women to consider careers in the sciences, but also to advise them on how to prepare for such professions and to provide job information.

Of the 25 workshops, 16 are for college and university students, one for graduate students and three for alumnae with at least a B.S. degree who are neither in graduate school nor in scientific jobs commensurate with their training.

Each grantee institution selects participants from its own student body and from neighboring colleges and universities, while posteducation workshops carry no geographic limitations.

All NSF-funded workshops cover a wide spectrum of scientific disciplines including computer science and engineering, Callanan noted.

Cooperative Companies

Asked if the birth of this NSF program was related to the quotas that require business organizations to hire a certain percentage of women, Callanan said, "Not directly, but some companies would look favorably on this program because they are anxious to employ more women and would have a larger pool from which to hire.

"Companies have been cooperative and willing to let their female scientists participate in the workshops," she added. In the past, panelists and speakers at the workshops have included women from industry and government.

"The project directors at the various universities wanted these people to show that the scientific careers out there are not only in academia," she said.

Previously awarded and currently active projects supported by the Women in Science Program include six science career facilitation projects for women with science degrees who are currently not employed or underemployed in terms of their potential.

These projects provide up to 12 months of training to update and augment the scientific knowledge and skills of the participants, Callanan explained. When training is completed, the participants are expected to be prepared to enter graduate school or the job market immediately.

The following universities offer NSF-funded science career facilitation projects: University of California, Davis, Calif.; American University, Washington, D.C.; University of Lowell, Lowell, Mass.; Polytechnic Institute of New York, Brooklyn, N.Y.; University of Dayton, Dayton, Ohio; and University of Texas, Austin, Texas.

OMB Solicits Comments

WASHINGTON, D.C. — The Office of Management and Budget (OMB) is requesting comments on federal procurement regulations proposed to help implement President Carter's inflation-fighting program.

The proposed regulations will ensure that the federal government buys goods and services from companies in compliance with the wage and price standards the President outlined Oct. 24 [CW, Oct. 30].

OMB Director James T. McIntyre Jr., in releasing the proposed regulations, said "the President wants the government to contract only with companies which cooperate in the fight against inflation."

The main features of the proposed OMB regulations are:

- Solicitations issued after Jan. 1 for new contracts will include a provision requiring the contractor to certify that he is in compliance with the wage and price standards.
- Companies determined by the Council on Wage and Price Stability to be noncompliant will be ineligible for federal contracts or subcontracts.
- Companies which certify their compliance but are later found not to have been in compliance at the time may be terminated for default.
- Waiver of the contract certification will be considered only "because of an urgent national security or public safety [consideration] and where there are no alternative sources."

The deadline for comments is Dec. 1. They should be sent to the Office of Federal Procurement Policy, OMB, Room 9013, 726 Jackson Place N.W., Washington, D.C. 20503.

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For Information Policy

Revamp Team Drops Call for Presidential Aide

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. – The final report of the President's reorganization project for federal data processing, expected by year's end, will not recommend appointing a special assistant to the President for information policy, as was called for in the draft version of the report circulated earlier [CW, Sept. 11].

During a session of the Federal Computer Conference held here recently, several members of the reorganization project discussed the recommendations to be contained in the final report, now being prepared under the direction of A.P. Jensen, Carter Adviser from the Georgia Institute of Technology's School of Information and Computer Science.

Jensen told the conference attendees a minority opinion will be included in the final report advocating the special assistant position. About 30 to 40 of the project's 55 members wanted the White House backing. Such a position would add to the project's recommendations, he said.

Controversial Point

The recommendation to establish a special assistant to the president for information technology policy, plans and programs (ITP) was a controversial point among the project members even before the draft version of the project report was prepared several months ago.

That version called the recommendation "somewhat controversial" and reviewed the pros and cons of establishing the White House position. The draft gave as an argument for the proposal the hope that the position "would place close to the President the responsibility for seeing to it that long-term policy for this crucial [information] technology is formulated."

In addition, the report said, "It would offer hope of getting ahead of the game in dealing with issues that in the past have been recognized late and dealt with in disarray.

"The establishment of a special assistant for ITP is the only option available that would neither create a large bureaucratic entity nor delegate the responsibility for the solution of urgent information technology problems to agencies [Office of Management and Budget (OMB), for instance] that have in fact been partly responsible for the very existence of those problems."

Arguments Against

The draft version of the report noted there are equally strong arguments against the special assistant position. "The creation of such an office could be interpreted as detracting from the principle [stated in the report] that information policy and information management should be a part of every federal agency and, as an all-pervasive function, should be highly distributed for decentralized advocacy.

"Questions such as privacy, security against fraud and constraint on the international flow of information are directly intertwined with already existing base functions throughout the federal government. The placement of new responsibilities in the White House might be considered contrary to the spirit of diffusing supporting policy functions throughout the government."

It was also noted that "the creation of such an office could be interpreted as an attempt to place another special-interest advocate within the Executive Office of the President ... There is also some danger that a special assistant for ITP would act in the name of the President, but without the President's informed consent."

In addition, some members of the reorganization project have pointed out that very similar arguments were raised in deciding to abolish the former White House Office of Telecommunications Policy (OTP). They argue that it would be unwise to create an office (ITP) almost identical to one previously judged unnecessary and undesirable.

Main Impetus

The Federal Computer Conference panel noted the main impetus for recommending the special assistant position was the recognition of the need for a dramatic change in the way information policy is made and the way DP resources are acquired and used in the federal government.

Brigadier General L.J. Riley, deputy commanding general of the U.S. Army Computer Systems Command and a reorganization project member, told the session attendees, however, "The establishment of such a position would be detrimental to the success of the other recommendations in the report."

The report recommends more responsibility for DP at the program management level, he noted, which does not fit the idea of creating a centralized, upper management level position for that responsibility.

The fact that OMB has not been able to effectively offer DP management guidance for the federal government, as mandated by the Brooks Act (Public Law 89-306), does not mean that office might not do better with greater funding and a stronger mandate, he argued.

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After Intense Debate

Brazil's DPers Solidify National Policy Stance

By Ney Seara Kruel

Special to CW

RIO DE JANEIRO, Brazil — After five days of intense debates at the recent 11th National Congress for Data Processing here, delegates from all of Brazil's DP organizations agreed on a resolution that spelled out their views on a national informatics policy.

Their report included a warning that in developing countries like Brazil, the introduction of the computer into vital activities such as social security services, tax collection, banking networks and even police records makes it a most important instrument of social change.

Considering the minimal participation of individuals in the decision-making processes of private corporations and government agencies today, the use of computers in all aspects of societal control is a disquieting factor, the resolution said.

A good example is the government project of a universal identifier. In order to rationalize civil service practices, a single register for all citizens would be a very practical solution, according to a member of the committee charged with the creation of the National Register of Natural Persons (Renape).

This register would be controlled by a joint commission of representatives from the ministries of justice, labor, finance, social security, planning, the armed forces and the National Information Agency. "Civil registers are not only a need of the state, but also of the citizen. If the state protects the citizen, if the state 'tutors' him, it has to know whom to protect," the committee member said.

The DP community in Brazil does not seem to share the same views, however. The final report of the conference recommends that the government "definitively abandon the studies for the creation of a universal identifier and stop the Renape project."

Stressing that the right to privacy is closely intertwined with other individual rights, the report added that "regulations must be instituted to avoid any abuse in the handling of information on the private life of citizens filed in computers and to give them permanent access to these files."

National Sovereignty

The privacy issue in Brazil has another important aspect: national sovereignty. The evolution of data banks together with the growing improvement of international communications services has created a great concern for the possibility of other countries' increased use of strategic information on Brazilian economic and social conditions, as well as on Brazilian individuals.

The report echoed these concerns in several of its recommendations. Even though the marginal cost of information filing and retrieval in foreign data banks is lower than that of creating internal data banks, it was recommended that "data banks for social and economic information should be kept within domestic boundaries as an imperative of national sovereignty."

This nationalistic bias has the intention of making the presence of domestic DP corporations, private or state-controlled, a hindrance to the "unlimited expansion of multinational corporations" in order to retain control over such a strategic section. It is believed the "unfair" competition of corporations with greater technological capacity can only be checked by government protection.

Previous experience in other countries has proven this difficult to understand through traditional economic theories and more difficult to develop because of strong international pressures.

The technological problems, then, cannot be left out of the privacy issue framework in a developing country like Brazil. The creation of a national DP industry here in the last few years has been the beacon for further policy arrangements vis-a-vis the large multinational corporations of the sector. Starting with the manufacture of minicomputers, the Brazilian DP industry — and market — has shown considerable potential to extend this to larger systems and projects, for medium-sized computers are already being made. This has created a dynamic process of inward-oriented policies with frequent clashes in the international environment.

International data flow, for instance, has been curbed by a government regulation that requires firms to seek approval from the Commission for the Coordination of Electronic Data Processing (Capre) before transmitting such information over international

(Continued on Page 11)

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DP Helps Boost U.S. Trade Balance

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Commerce Department reported a $480 million favorable balance of U.S. trade in electronics products during the first half of 1978.

Exports for the first half totaled $5.4 billion and imports were $4.8 billion for a total two-way trade of $10.1 billion.

Consumer electronics made up 46% of imports, followed by electronic components with 26%. Computers and related equipment provided 35% of exports and electronic components 27%.

Data Bank Urged On Toxic Substances

A group representing four regulatory agencies has recommended the development of a computerized federal directory of all laws, existing and proposed regulations and guidelines concerning toxic substances.

The work group, part of the Interagency Regulatory Liaison Group (IRLG), also looked at the possibility of developing an integrated system for the collection, retrieval and analysis of data from studies on toxic substances. The group said existing systems and those under development could be modified to provide the required capabilities, according to the group.

The IRLG, formed in August 1977, includes the Occupational Safety and Health Administration, the Environmental Protection Agency, the Food and Drug Administration and the Consumer Product Safety Commission.

In recommending the computerized directory, the work group said it had interviewed both private-sector and government personnel and found no comparable system exists. There was an expressed interest in and need for such a system, it noted.

Brazilian DPers Solidify Stance

(Continued from Page 10)

telecommunications lines.

The conference report, consistent with this line of action, has proposed the creation of special legislation for the control of international data transmission systems "in order to protect the interests of the Brazilian society."

Within the framework of a national informatics policy — a government-oriented set of regulations — the "protection of the Brazilian society" seems contradictory in terms of normal privacy standards.

However, the complexity of the development of a government-protected domestic industry, together with the growing concern for excessive government interference in the individual lives of its citizens, has created in Brazil a unique situation in which individuals, of cold economic necessity, need to have greater control over government policies since it is through government help that the domestic industry is developing. Thus the need for privacy rights has also become an urgent political necessity for increased participation in government decision making.

Washington Update

Commerce Picks Day As NTIS Director

Dr. Jordan J. Baruch, assistant secretary of Commerce for Science and technology, recently announced the appointment of Melvin S. Day as director of the National Technical Information Service (NTIS).

Day was previously deputy director of the National Library of Medicine and has held management positions with the National Science Foundation, where he was director of the Science Information Service, and with the National Aeronautics and Space Administration.

NTIS is the center for government-sponsored scientific and technical information.

Adapso Relocates In Nation's Capital

The Association of Data Processing Service Organizations (Adapso) has moved its executive offices to the Washington, D.C. area.

Jerome L. Dreyer, Adapso executive vice-president, said the move from the previous headquarters site of Montvale, N.J., was originally scheduled for next spring.

Byrne O'Brien has been appointed the association's director of administration and finance, and Michael Nugent is the new Adapso staff attorney.

"With our new offices in the Washington area," Dreyer said, "we can expand our efforts on behalf of our member companies with Congress, the regulatory agencies and other government organizations that are also headquartered locally."

The new Adapso headquarters are at 1925 N. Lynn St., Rosslyn, Va. 22209.

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GAO Labels Federal DP Security 'Inadequate'

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The DP security programs of many federal agencies are inadequate, reflecting an apparent lack of interest on management's part, a not-yet published report by the General Accounting Office (GAO) charges.

The report, discussed in detail at the recent Federal Computer Conference here, "is not too complimentary to the agencies," according to Robert G. McKenzie of GAO's Logistics and Communications Division.

McKenzie, who presented an outline of the report, said every agency reviewed had a security program of some sort, but most "lacked the management support needed to achieve comprehensiveness."

The primary problem the GAO found was that security functions are not at a high enough management level and management in general does not get sufficiently involved in or get enough feedback on security programs to assure their efficacy.

Ten agencies, including the Civil Service Commission, the Postal Service and the Social Security Administration, were selected for review. They were chosen, according to McKenzie, because they possess personal or sensitive data in their computer systems or because they process data by remote terminals.

A major finding of the investigation was that security organizational structures in the 10 agencies are often inadequate for independence and control. McKenzie cited lack of separation of security and DP operations as a factor in the inadequacy.

Whenever security and operations conflict and are under the same management, he said, the demand for smooth operations usually wins out over the need for security.

The study found a general problem in designating responsibilities for security programs. Responsibilities often are not clearly defined or are fragmented or overlapping, the GAO said. In some cases no single person is in charge of security.

A lack of comprehensive security procedures for monitoring and reporting, training, backup and contingency and violation reporting was cited by the GAO.

The agency found little use of risk management because of low priority and lack of management concern. "Intuitive selection of safeguards at most agencies results in little assurance that they minimize the risk or are cost-effective," the study said.

The GAO also found a general lack of adequate guidance on how to perform a complete risk analysis for all types of safeguards. Most agencies have not done the data sensitivity analysis that is the first step in designing a security program, it noted.

Examples of Noncompliance

The GAO found many instances of noncompliance with security procedures, such as password changes for departing system users not accomplished; sensitive computer output not marked; security officers and staff not knowledgeable of computer technology; terminals not secure; no contingency plans or formal backup agreement; and, in some cases, no security training provided to DP personnel and system users.

More internal audit involvement is needed in reviewing security in existing and new systems, the GAO said. Cases of limited audit involvement result from a lack of top management support or direction, low priority for DP security audits in general and inadequate resources and lack of expertise to study security programs in detail.

The GAO also found inadequate security training. Limited or no training at all was provided to many DP operators, designers, programmers and system users, the study said.

Another widespread problem was inadequate background investigations of personnel. In many cases, only top management got full clearance, and there were often no follow-up investigations or procedures for identifying and investigating disgruntled employees involved with sensitive data.

The GAO study produced a long list of other administrative problems in the agencies' security programs, including physical and technical safeguard problems. The review found such problems as user manuals and portable terminals being taken home overnight by employees.

Study Suggestions

The GAO concluded that top management must direct and provide resources for a "concerted program of computer security." To that end, the study suggested that government agencies:

- Establish an independent security function with necessary authorization to control the program.
- Establish comprehensive policy, plans and procedures.
- Use a risk management approach to safeguard selection.
- Perform continuous monitoring and reporting to correct deficiencies and point up needs for new risk management.
- Introduce more internal audit involvement in computer security matters.
- Assure adequate training in security.
- Perform more extensive background investigations, with follow-ups, on federal and contractor employees processing sensitive data.

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Amdahl Suggests Two Rules

Users Advised to Improve Software Skills

By Ronald A. Frank
CW Staff

WASHINGTON, D.C. — Software methods will have to be improved over the coming years if users are to get optimum use from their large mainframes, according Dr. Gene Amdahl, founder and chairman of Amdahl Corp.

Speaking at the recent Federal Computer Conference here, Amdahl advised users to follow two main rules in developing software.

First, he said, it is essential to maintain a set of rigid programming rules so software is portable when applications outgrow the system on which they were developed.This is critical if expensive conversion efforts are to be avoided, he remarked.

Second, users should maintain strict control over the structure of files. File structure is really "the lifeblood of a transaction," Amdahl noted, and if this is not controlled correctly, operating problems will result.

Often files outgrow peripheral devices' capacity to handle them, and when a transfer becomes necessary to upgrade I/O units, the software must be adaptable to such a change without a major rewrite.

The average user now spends two-thirds to three-quarters of his programming hours in program maintenance, Amdahl said, attributing this to the way applications programs change with time. As a result, it is important for users to structure their programs with greater clarity, he explained.

Amdahl Corp. has been doing research in this area and will soon announce a software product called VM Program Enhancement (VMPE) that will allow Amdahl CPU customers to optimize their VM/370 operations.

Specifically, VMPE will allow a CPU to run a production copy of IBM's MVS on top of VM/370 without additional overhead. This capability will be introduced soon, Amdahl said.

Users will have to find methods to keep software as orderly as possible during these days of transition, Amdahl observed, or upgrades will move faster than customers can keep up with them.

DOD Language Named

By Robert L. Glass
Special to CW

WASHINGTON, D.C. — "Ada" has been chosen as the name for the forthcoming Department of Defense (DOD) computer programming language.

The language was named after the first programmer in history, according to Lt. Col. William A. Whitaker of the Defense Advanced Research Projects Agency.

Ada Augusta, Countess of Lovelace, was one of the few contemporaries of computing pioneer Charles Babbage who understood his work on calculating machines.

When Babbage created his Difference and Analytical Engines in the early part of the 19th century, Augusta wrote a program for computing Bernoulli numbers.

She translated into English a significant paper on Babbage's work and added her own comprehensive notes about machine usage and even corrected errors in Babbage's work.

Augusta, the daughter of the poet George Gordon, Lord Byron, was also an accomplished musician.

With the selection of its name, the DOD effort is now on schedule. First definition of the language will be made in April 1979, and the first funded compiler, produced for the army, is expected in May 1981.

The announcement of the name selection was made by Whitaker at a quarterly language review here held to evaluate the competing language definitions.

Corrections

In "Graphics Systems Worth Initial Pains" [CW, Oct. 30], the speaker is quoted as saying that "business managers must undergo a trial by fire" and take the time to learn how to use their computers. However, the article failed to note that this was true in previous years and not today.

Human Resource Systems, a minority recruitment firm for the DP industry [CW, Oct. 16], is not in Los Angeles. The company's correct address is DelAmo Financial Center, Suite 225, Wells Fargo Bank Building, Torrance, Calif. 90503.

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First Detroit Marathon Scored

DETROIT — A computer system was deployed at the finish line of the first Detroit Free Press International Marathon last month to process and print out the names and times of winners in more than 14 race categories.

The Burroughs Corp. B800, housed in one of the company's mobile demonstration units, was surrounded at the finish by a large crowd which erupted in cheers and applause as runners completed the 26-mile, 385-yard course.

The race results were especially important to those entrants who finished fast enough to qualify for the biggest event in running — the annual Boston Marathon, held in the spring. Men must finish in three hours to qualify, women in three and a half hours.

Operating with Burroughs' Results Analysis, Computation and Evaluation (Race) software program, the B800 provided fast results for judges, the news media and finishers at the Oct. 22 race.

The data base consisted of information about each entrant such as his running number, name, address, age, weight, citizenship and club or organization. As runners finished, their entrant numbers and times were entered into the computer through Burroughs TD 800 data entry terminals.

The computer then calculated the winners in the various age, sex and special categories. A complete printout of finishers and their times appeared the following day in Detroit newspapers.

In addition, a computer-printed certificate was awarded to each runner who finished the marathon.

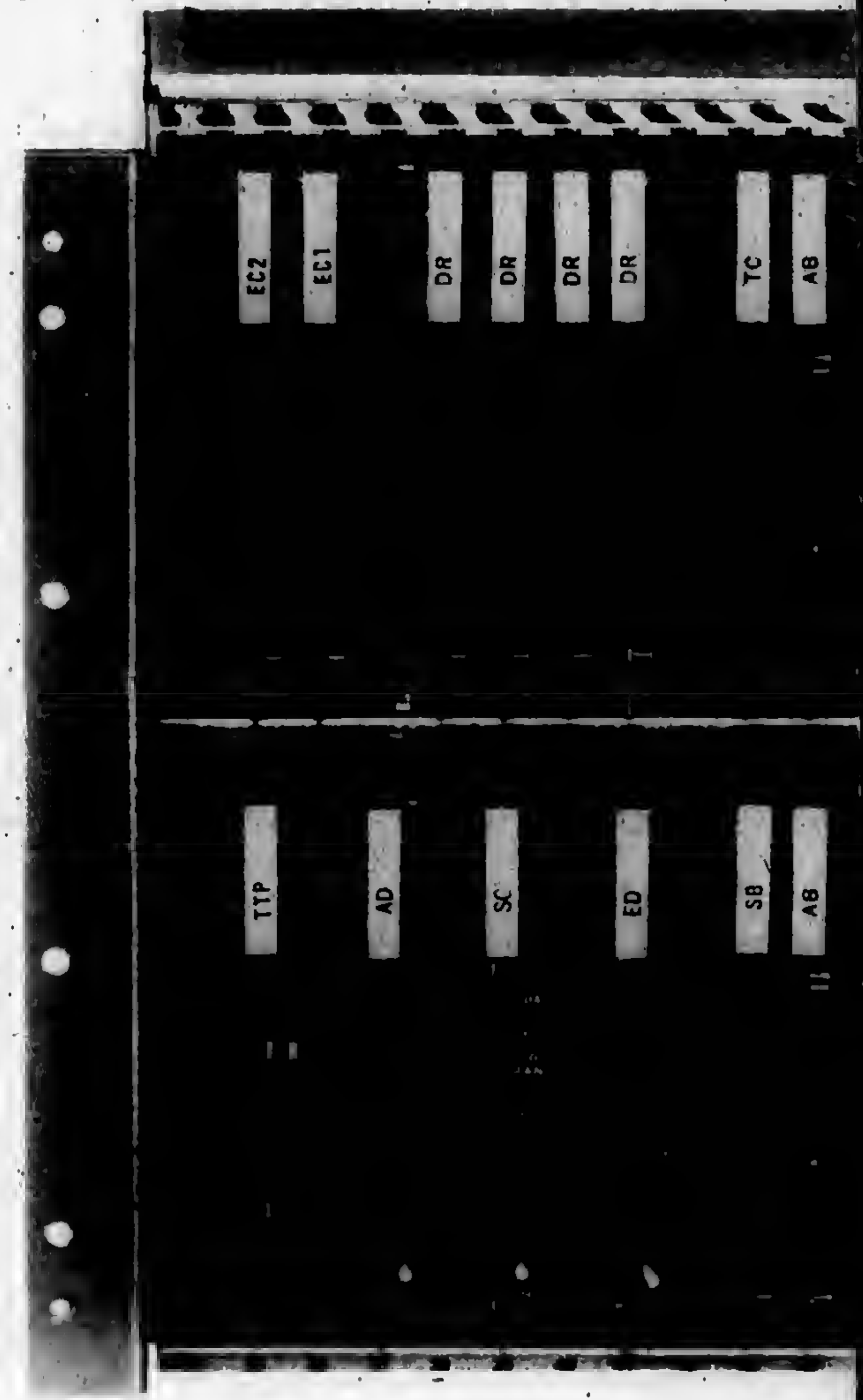
'Underwater' Mile

A unique part of the course was what is believed to be the first "underwater" marathon mile. After two miles on Windsor streets, runners went "underwater" through the Detroit-Windsor tunnel. Although hundreds of marathons are held annually, none runs through a major tunnel.

The one-mile passageway linking Canada and the U.S. was closed to traffic before the race started. The air in the tunnel was exchanged six by 24 huge ventilation fans to assure air purity for the marathoners.

Bob McOmber, a 27 year-old instructor at Bowling Green State University, crossed the finish line first in 2:17:37. With a time of 2:55:51, Erma Tratner was the first woman.

Mobile demonstration units equipped with computer systems were at the finish line of the first Detroit Free Press International Marathon to provide almost instantaneous results for judges, the media and entrants. →



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Mass. Council Picks Foley

Howard P. Foley

BOSTON — The Massachusetts High Technology Council (MHTC), an organization of 83 technologically oriented companies based within the state, has appointed Howard P. Foley as the association's executive director.

The MHTC represents a combined employment force of more than 138,000 people worldwide and over 70,000 in Massachusetts. The objective of the council is to improve the environment for high technology industries by promoting communication and cooperation within the industry itself and with financial, educational and governmental institutions.

Foley will be responsible for implementing the MHTC's plans and programs as well as coordinating the efforts of the member companies and local government agencies.

Three-Day Conference To Discuss Networks

WASHINGTON, D.C. — The concepts and problems of the emerging network environment for communications will be examined at Communication Networks '79, which will be held Jan. 30 to Feb. 1 at the Sheraton Park Hotel here.

The conference will combine a number of forums on communications network policy and technological trends with an exposition of communications hardware, software and services.

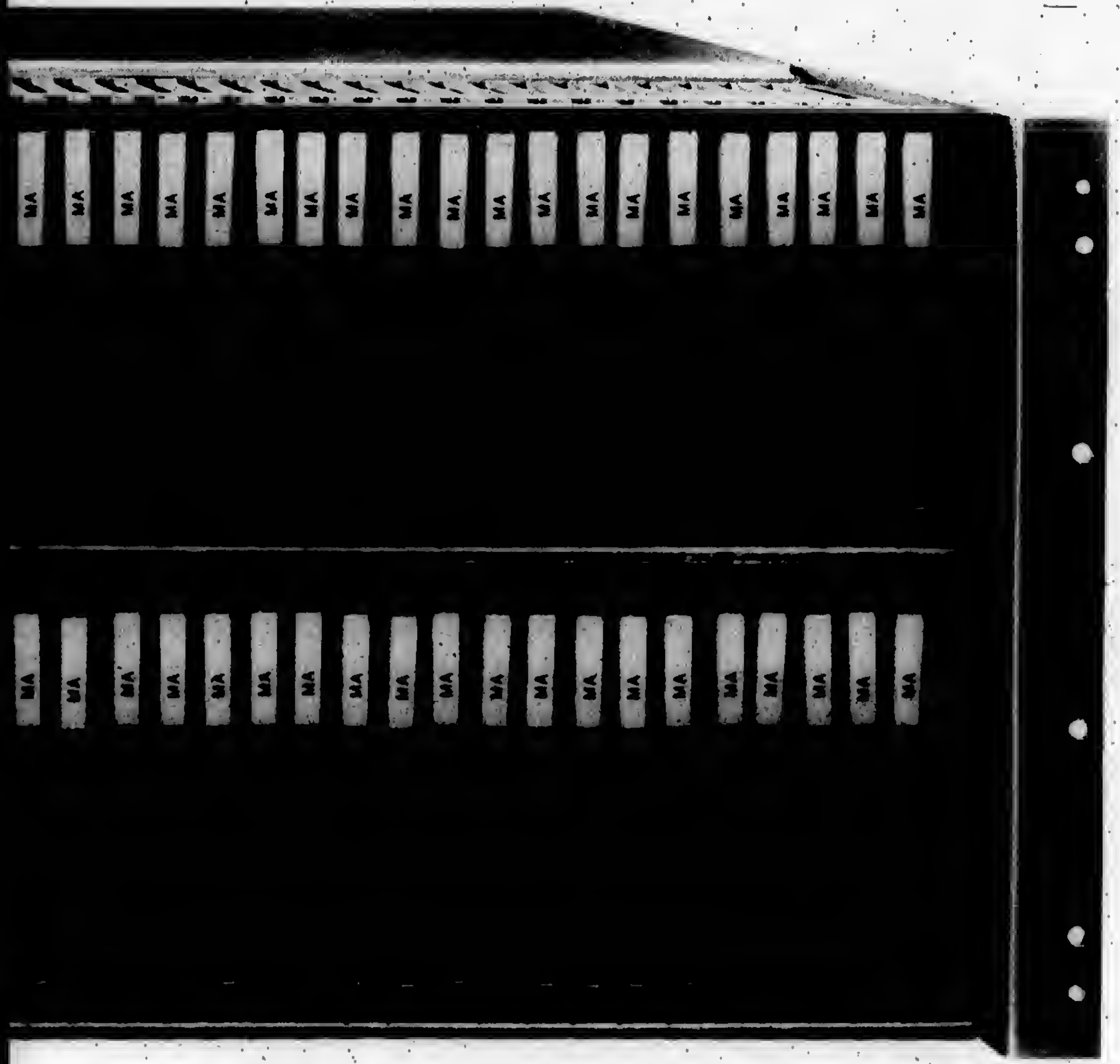
Richard E. Wiley, former Federal Communications Commission (FCC) chairman will be the keynote speaker. Wiley will also lead a session on the outlook for revising the Communications Act of 1934.

Speakers at that session will be Rep. Lionel Van Deerlin (D-Calif.), chairman of the House Subcommittee on Communications; Walter Hinchman, former head of the FCC Common Carrier Bureau; William G. Sharwell, vice-president of AT&T; and A.G.W. (Jack) Biddle, Computer & Communications Industry Association (CCIA) president.

Other highlights will include a regulatory affairs meeting; a "Futurists Field Day" panel in which speakers will offer a variety of technological forecasts for network development in the 1980s; and a luncheon address by Henry Geller, assistant secretary of Commerce for computer and communications affairs, who has been working within the federal government to restructure policy and supervision of the communications and information flow marketplace.

A number of afternoon workshops will cover such topics as network planning and design and software for communication networks.

The conference registration fee is $295, with a $25 discount for preregistration before Jan. 1. Further information is available from The Conference Co., 60 Austin St., Newton, Mass. 02160.



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NSF's Atkinson to Keynote

ACM Sets Annual Meeting in Capital Dec. 4-6

COLLEGE PARK, Md. — Nearly 100 sessions on topics ranging from computer systems and networks to software psychology will be presented at the Association for Computing Machinery's (ACM) annual meeting in Washington, D.C. on Dec. 4-6.

The three-day meeting, featuring both industry and government representatives, will focus on artificial intelligence applications, programmer overtime, the automated office, data base management systems, computer architecture, microprocessor technology and computers in education, a spokesman stated.

Graphics, software development and transborder data flow will also be discussed during the program.

Richard Atkinson, director of the National Science Foundation (NSF), will deliver the keynote address and Daniel McCracken will give his views on the state of the ACM.

Concurrently, the ACM will host the ninth North American Computer Chess Tournament during which 12 teams are expected to pit their computer programs against each other, and students will participate in the Capital Region Scholastic Programming Contest.

Registration fees for the ACM sessions are $85 for nonmembers, $60 for members and $15 for students. In addition, $25 of the nonmember fee may be applied toward the $35 fee for ACM membership at the conference site.

Additional information and a preliminary program are available from Richard Austing, ACM 79's general chairman, Department of Computer Science, University of Maryland, College Park, Md. 20742.

Cost Control Conferences Scheduled for Three Cities

HERSHEY, Pa. — A series of conferences on cost control sponsored by the Bank Administration Institute (BAI) will be held here Nov. 28-30. Conferences will also be held in Minneapolis on Dec. 11-13 and in Omaha, Neb. on March 19-21.

Sessions will deal with the fundamentals of a cost control system including case studies of successful programs and discussions about cost considerations of automated customer services, a BAI spokesman said.

Cost savings possibilities derived from product pricing, employee motivation, reduction of teller differences, prevention of internal fraud and developments in check processing will also be reviewed.

The fee for the November conference in Pennsylvania is $125 for BAI members and $150 for nonmembers.

For the Minneapolis and Omaha conferences, the fees will be $135 for members and $160 for nonmembers.

Further information is available from the BAI at P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

Programming Contest Open to Students

WASHINGTON, D.C. — Students in grades 7 to 12 who are proficient in the use of computers and programming are invited to participate in the Association for Educational Data System's 1979 computer programming contest.

The puropse of the contest is to recognize those students who develop outstanding projects in the field of programming. Prizes will be awarded in the categories of business, biological and physical science, computer art, computer science, games, simulations and mathematics.

A category has been added to recognize programs developed by junior high school students, a spokesman said. However, these applicants are also eligible to compete in any or all of the other listed areas.

Application forms and further information can be obtained from the association's headquarters at 1201 16th St. N.W., Washington, D.C. 20036.

Government DP Executive Elected DPMA's President

NEW ORLEANS — The Data Processing Management Association (DPMA) has elected George R. Eggert, a DP executive with 23 years' experience in the federal government, as its 1979 international president.

A DPMA member since 1955, Eggert is chief of the Office of Planning and Management for the Department of Defense's Contract Administration Services Region (DCASR), based in Chicago.

At DCASR, Eggert is in charge of planning, organization and promotion of a centralized management organization, including creation and maintenance of a $28 million program budget.

A member of the advisory council of the Information Privacy Research Center at Purdue University, Eggert has also served on a working committee of the American Federation of Information Processing Societies, which, in conjunction with the Executive Branch's Office of Management and Budget, reorganized DP and administration functions in the government.

George N. Eggert

Eggert is a member of the Editorial Advisory Board of *Information Privacy*, a magazine published in England.

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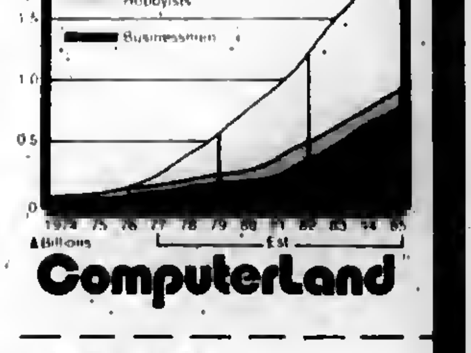

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System Gives Realtors Neighborhood Profiles

By Tim Scannell
CW Staff

STAMFORD, Conn. — Residential real estate brokers, appraisers and corporate relocation companies have at their fingertips a computerized listing that can provide such information as the median age, median income, mobility ratio and average number of children in any given neighborhood within the U.S.

Donnelley Marketing's Community Profile System (CPS), introduced earlier this year and just recently made available on a nationwide basis, translates statistics gathered from the U.S. Census Bureau, standard telephone directories and other publicly accessible sources into specific names and addresses. The system covers more than 65 million households, nearly 85% of everyone in the U.S.

"A [house] is the single largest purchase a family makes," Robert Swick, Donnelley's marketing manager, explained "and while the [real estate] industry does a very fine job of giving an explicit description of the property a buyer is thinking of acquiring, it astutely avoids giving any information on the perspective of a neighborhood."

Pick Your Flavor

A significant portion of a broker or relocator's responsibility is to "identify" the surroundings and give the prospective buyer an accurate view of the type of people residing in a certain area, Swick continued. The CPS does this by presenting "the different flavors, life-styles and characteristics of the communities."

Subscribers pay about $500 for each market or geographic sector which is usually the density of "at least a county and may be as high as two counties," Swick said. The listings or packages are updated annually and contain direct mail labels, telephone prospecting cards, infield portfolios and color-keyed maps that break down and simplify the formidable mass of statistical data.

The realty profile package is subdivided into four categories of use, Swick pointed out. First, as a managerial aid, the system identifies the characteristics of each neighborhood including the types of households — apartment or single family.

"This gives an office manager a perspective of how well his business is doing in relation to what's out there," Swick stated. Annual statistics also help the realtor keep track of the competition within a particular area.

Help for Realtors

Realty companies can use the managerial portion of the CPS as an inhouse training aid; it uncovers the specific names and addresses of key audiences that tend to be clouded by statistics.

"The real estate industry is suffering from a high degree of turnover," Swick noted. In fact, 30% to 40% is usually considered the norm, as agents drift from one agency to another or leave the business entirely.

"The CPS gives a manager a handle on how to make a new associate effective quickly by giving him a list of potential prospects." Previous methods included poring over newspaper lists and "crisscross" directories as well as initiating "cold" door-to-door calls, Swick explained.

The system's second feature, a prospecting tool, gives the agent all necessary materials to conduct business in a "disciplined, logical way," Donnelley's spokesman said. "The industry has worked an awful lot on the art of selling as opposed to the science of selling." The preaddressed labels, telephone cards and geographic portfolios make up this aspect of the package.

For Shuffled Executives

A corporate relocation aid is the third CPS offering and is geared toward executives who may be shuffled around the country frequently during their climb up the company's "ladder." Realtors, summoned by a corporate manager either facing relocation or relocating a staff member, can show and describe an area's characteristics. "If a guy's only got two years in a community, he should make the most of it from a social as well as an economic point of view," Swick said.

For instance, IBM employees like to relocate to areas that have a high turnover or mobility rate. "They know they're only going to be there for a few years so in a highly mobile area wives are able to make friends more quickly, the kids get along together faster and the family becomes a part of that neighborhood sooner," Swick explained.

The last aspect of the system is a home buyer orientation guide. This particular feature matches the views, life-styles and socioeconomic idiosyncrasies of a prospective buyer with those of a certain neighborhood.

People moving into a new area usually have preconditioned ideas of where and how they want to live, Swick stated. "CPS lends a little logic to this whole scheme of things."

Yearly Update

The CPS statistics are updated each year at a centralized DP facility just outside Ames, Iowa: An IBM 370/158 processes U.S. Census Bureau figures as well as statistics derived from "standard mathematical analysis techniques." It compares this data with information kept in Donnelley's master data base which contains names, addresses and information on 85% of the U.S. population.

Extensive security precautions are used to protect information in Donnelley's computerized files. These files contain name, residence and telephone number (and how long the number has been listed in the telephone directory).

The data also includes a "quantum set of demographic identifiers" that inversely relate to the consumer. Median income, occupation, education level and family size are detailed, Swick explained.

Donnelley has been in the direct mailing industry for more than 50 years and claims to have the largest residential data base in the U.S. A great deal of the company's direct mail marketing efforts are in behalf of manufacturers which use Donnelley's detailed lists to send monthly coupons and announcements to millions of consumers.

Although the computerized targeting system is designed for the real estate industry, the service is openly marketed to chambers of commerce, regional planning agencies, research libraries and other interested subscribers.

Authenticity Check

However, the authenticity of each person requesting demographic information is routinely verified, particularly if the person or organization is not a member of the National Association of Realtors (NAR), a nationwide industry consortium, Swick said.

"We just don't pick up anyone who writes in and says, 'Give me 300 names and addresses of people down the street here,' " Swick stated. "We have very tight security control."

In fact, the NAR has been very encourageing about Donnelley's CPS from the very beginning, Swick said. "There are many courses out there and many instructional manuals that try to tell the broker how to do his business, but literally there is a dearth of products and services that really apply all of this theory."

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Recollections, Anecdotes Sought on DP History

ANN ARBOR, Mich. — Articles, anecdotes, personal recollections and commentaries are currently being solicited by the editorial board of a quarterly that will be published by the American Federation of Information Processing Societies (Afips).

The *Annals of the History of Computing* will focus on events and developments that occurred at least 15 years prior to the date of publication of each issue.

The journal will also include descriptions of historical projects; collections of private, historically relevant letters; articles on the influence of societal factors on DP's development; reports of significant computing successes and failures; and annotated bibliographies of computer-related publications, a spokesman stated.

Annals is an outgrowth of an Afips publications committee study on whether to create a journal to record vital contributions to DP.

Prospective contributors can contact Bernard Galler, editor-in-chief of the *Annals*, at the University of Michigan's College of Literature, Science and the Arts, 2522 LSA Building, Ann Arbor, Mich. 48109 for additional information.

Charter subscriptions are priced at $15 for members of Afips constituent societies, $20 for nonmembers and $40 for institutions. All subscriptions should be mailed to Afips Press, 210 Summit Ave., Montvale, N.J. 07645.

Calendar

Nov. 29, Dearborn, Mich. — **Seminar on Data Management System II (DMSII).** Contact: MIS International, Inc., 31350 Smith Road, Romulus, Mich. 48174.

Dec. 1, San Francisco — **Development of Computer Courseware Authoring Techniques,** sponsored by the Association for Educational Data Systems (AEDS). Contact: AEDS Workshops, P.O. Box 951, Rolla, Mo., 65401.

Dec. 4-6, Washington, D.C. — **The Data Base Course.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Dec. 4-6, Atlanta — **Laser Beam Information Systems.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 4-6, Atlanta — **Minicomputers and Distributed Processing.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 6-8, Washington, D.C. — **DP for Non-DP Managers.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Dec. 6-8, Kingston, R.I. — **Management Skills Development for First and Mid-Level Managers.** Contact: College of Business Administration, University of Rhode Island, Kingston, R.I. 02881.

Dec. 6-8, Boston — **Data Base Design '78.** Contact: AMR International, Inc. 1370 Ave. of the Americas, New York, N.Y. 10019. Also being held Dec. 11-13 in Denver.

Dec. 6-8, Washington, D.C. — **Data Processing Operations Management.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 8, Syracuse, N.Y. — **Management Information System Concepts for Educators,** sponsored by Association for Educational Data Systems (AEDS). Contact: AEDS Workshops, P.O. Box 951, Rolla, Mo. 65401.

Dec. 11-12, Washington, D.C. — **The Emerging Revolution in Health Records Policy.** Contact: AMR International Inc., 1370 Ave. of the Americas, New York, N.Y. 10019.

Dec. 11-13, Chicago — **Project Management for Computer Systems.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Dec. 11-13, Washington, D.C. — **DP Systems Analysis for Managers.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Dec. 13-15, Denver — **Distributed Minicomputer Networks,** sponsored by the Institute for Professional Education. Contact: The Institute for Professional Education, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

Dec. 13-15, Washington, D.C. — **Effective Leadership of Data Processing Projects,** sponsored by the Institute for Professional Education. Contact: The Institute for Professional Education, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

Dec. 14-15, Washington, D.C. — **Data Communications: Advanced Concepts and Systems,** sponsored by Datapro Research Corp. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

High Turnout Expected

Ifip Sets '80 Congress in Australia

MELBOURNE, Australia — Conference organizers expect between 2,000 and 3,000 registered delegates to attend the 1980 World Computer Congress here, sponsored by the International Federation of Information Processing (Ifip).

The show will be held at Melbourne's Exhibition Building, where more than 60,000 square feet of space will be available for exhibitors. "If there is any doubt about Australia's role in the world computer stakes, the exhibition will cement our foothold until the turn of the century," according to Bryan Humphris, general manager of Ridell Exhibition Promotions, Pty. Ltd.

It will be the largest single computing exhibition ever staged in Australia, he added.

The exhibition should benefit local and overseas manufacturers who want to display the latest in information processing, according to Humphris. He is optimistic that it will bring in potential buyers who otherwise might not be likely to visit Australia.

Melbourne is one of two sites selected for the 1980 Congress; the other is Tokyo.

Information on the exhibition, which the promoters expect will attract Australia's entire computing profession, is available from Ridell Exhibition Promotions, 166 Albert Road, So. Melbourne, Vic., Australia 3205.

December Seminar to Focus On Preparing Contracts

WASHINGTON, D.C. — A three-day course entitled "Computer Contract Negotiation," starting here Dec. 11, will focus on the legal and financial consequences of preparing computer contracts.

The course will be taught by Dick H. Brandon, internationally recognized computer expert; Sidney Segelstein, a computer law expert; and Joseph Auer, president of International Computer Negotiations, Inc.

The fee is $650 and the course is limited to 60 persons. Additional information is available from Ruth Dargis, Brandon Consulting Group, Inc., 505 Park Ave., New York, N.Y. 10022.

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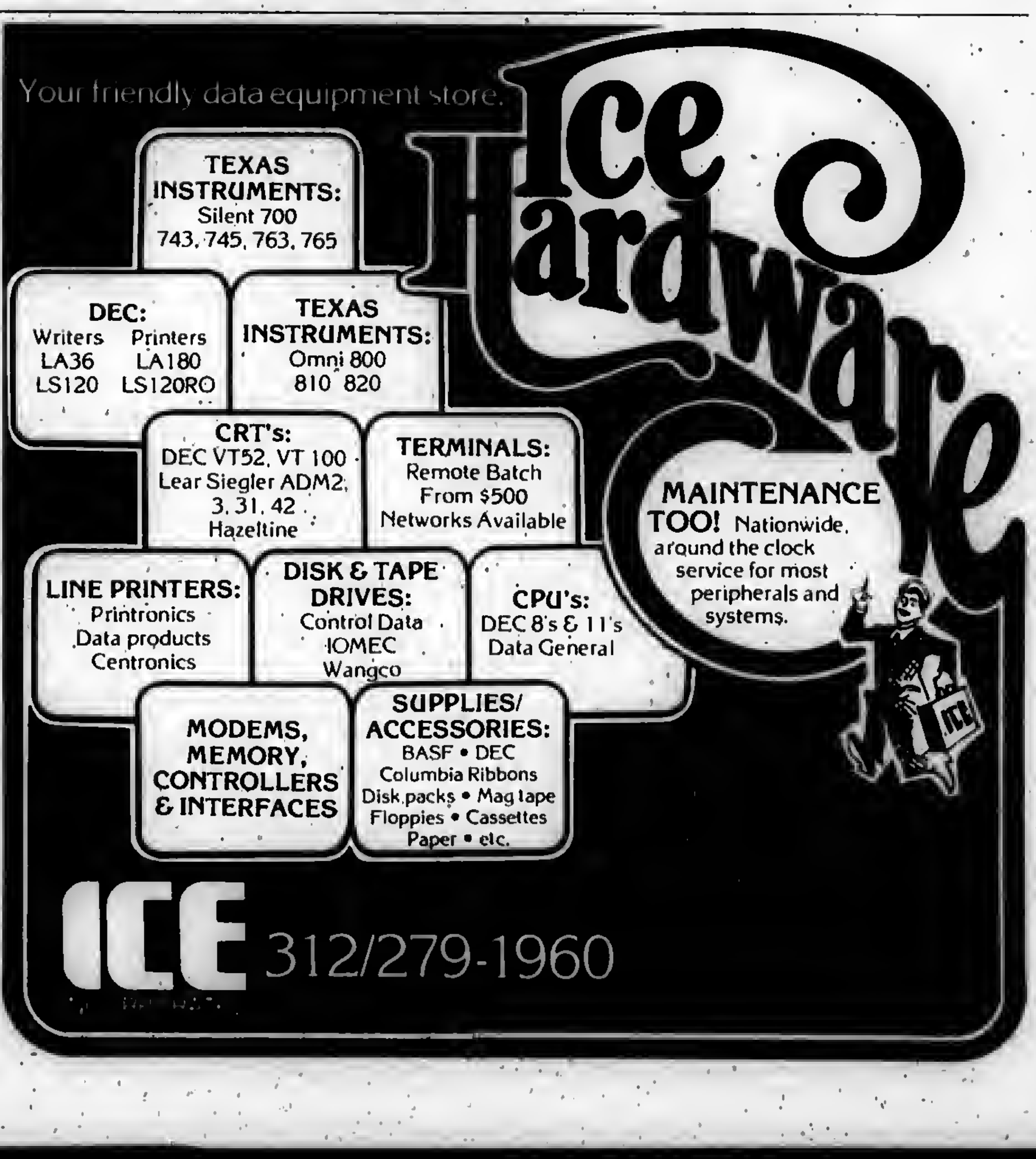

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Editorial

Efficiency Steps Backfire

When management blindly accepts a computer-assisted solution to a problem without examining that solution's effect on workers, the results can be devastating.

A case in point is the recent strike of warehouse workers at Safeway Stores, Inc. The strike centers around a system that calculates workloads based upon the body motions of warehouse employees. [CW, Nov. 13].

But efficiency experts aren't new and neither are the abuses arising from the overzealous application of mechanistic techniques.

During the 1920s, Frederick Taylor, often referred to as "the father of scientific management," observed the hand motions of coal miners to determine the most efficient way of mining. Taylor tried to apply his observations with an eye to making jobs more efficient and teaching workers the best way to approach their tasks.

Building on Taylor's work, many efficiency experts devised techniques to enhance productivity. Eventually, because these methods were viewed as reducing the human being to a machine, many firms abandoned the use of efficiency engineering.

One project frequently alluded to in the annals of organizational behaviorists involves a coal mine in which workers who formerly worked together on a section of a mine were separated and assigned specialized tasks, according to scientific principles of labor management.

However, productivity dropped. Why? The efficiency expert failed to consider that the miners were working together for safety reasons. Their work group was formed not only on the basis of their tasks but also because they needed each other in case of an accident in the mine.

In the recent case, while Safeway's use of an application program to calculate workloads cannot by itself be faulted, the corporation has seemingly neglected to analyze the effect of the computer's solution to the firm's productivity problem.

If 90% of Safeway's 250 warehouse employees have been disciplined because of poor productivity since April 1977, as workers have charged, did Safeway try to determine what factors were causing the high failure rate in meeting workload quotas?

The fact that the workers do not understand the system and consider themselves at the mercy of a computer programmer and a supervisor — with no means of verifying the validity of the supervisor's criticism — may be a tipoff to the underpinnings of the problem.

It appears the application program used to solve the problem should have been more thoroughly scrutinized by management earlier to see if the program rather than the people were at fault.

Whether Safeway's management understands that computers are merely business tools and not judges and juries is unknown because it would not comment on the strike.

Surely, though, the strike, now entering its fifth month, is doing nothing to enhance productivity for either the workers or management.

Data Past

Five Years Ago
Nov. 21, 1973

TULSA, Okla. — Judge A. Sherman Christensen reduced by $93 million the amount of damages IBM was to pay Telex Corp. for IBM's violation of the antitrust statutes and significantly weakened the injunctions he had originally imposed on IBM. Nevertheless, the judgment against IBM still called for a hefty $259.5 million payment, three times the actual damages of $86.5 million awarded earlier.

— — —

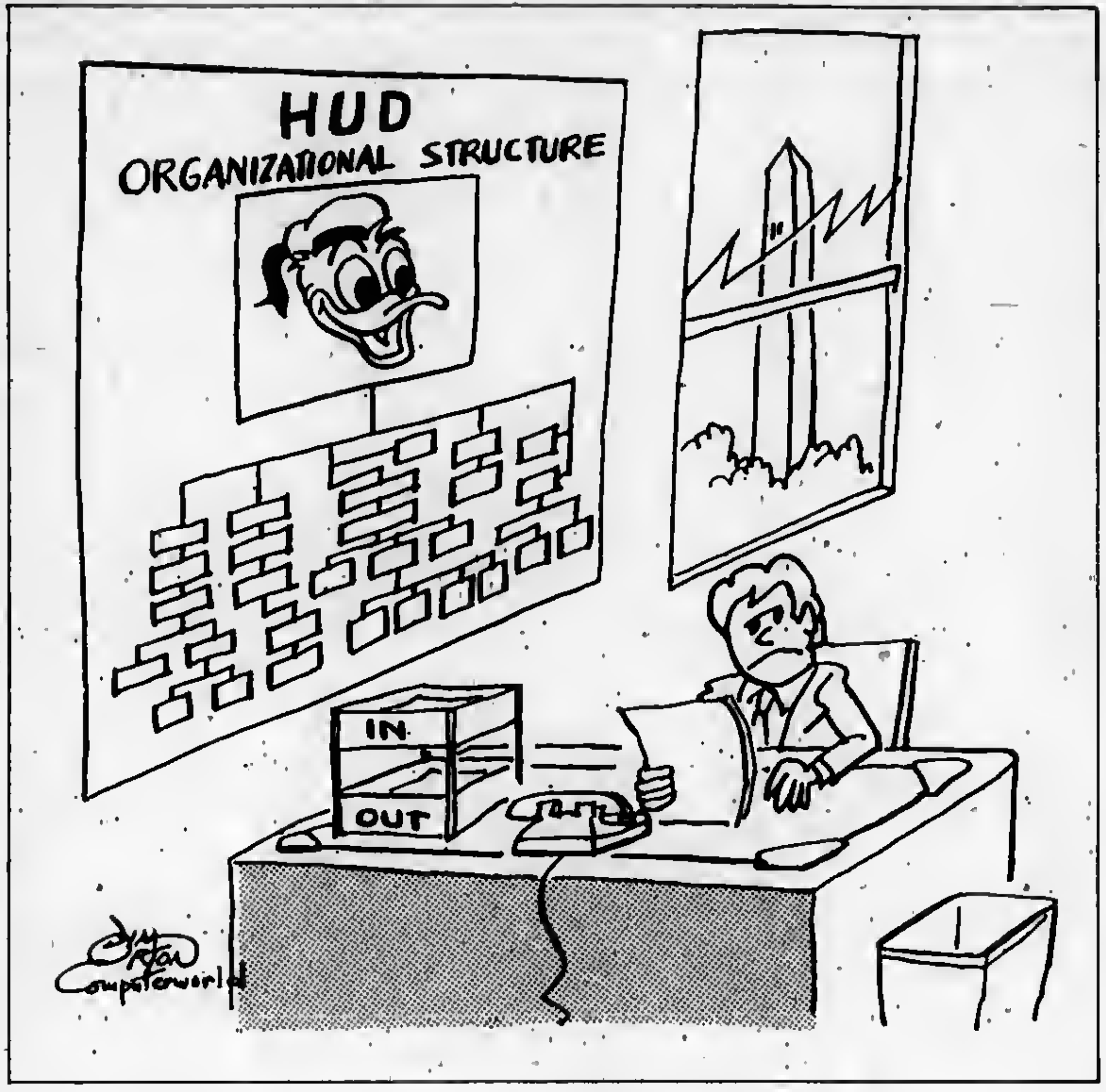
WASHINGTON, D.C. — The threat of a serious energy shortage confronted users with possible problems in the disk and tape area. Suppliers said they expected a "pinch" in the supply of solvents used to bind ferric-oxide coatings to tapes and disk packs.

Eight Years Ago
Nov. 25, 1970

HOUSTON — Twenty-one thousand attended the Fall Joint Computer Conference here. Overall figures showed that the attendance figure was proportionately down from the previous fall's 23,000 but was still somewhat higher than that for other society conventions held earlier in the year.

— — —

DETROIT — In a three-to-one vote, the city's Board of Canvassers, the authority responsible for determining the accuracy of the Nov. 3 punched card election count, refused to certify this city's primary election as final and official. As a result, it was possible that the election, which had its count delayed for 56 hours, could be nullified.



Letters to the Editor

Biased, Superficial Attack

Our firm takes strong exception to an article by Alan Taylor that appeared under the sensational and misleading headline "Major Audit Firm Cited for Unethical Practices" [CW, Oct. 30].

The bulk of the column was a rehash of charges made by a twice-fired City of Detroit employee more than 18 months ago. Because these charges were made at a time when Dennis Green, former finance director of the City of Detroit and later a high-ranking member of President Carter's Administration, was being considered for a federal appointment, the U.S. Attorney and the Federal Bureau of Investigation (FBI) reviewed the matter.

At the conclusion of the FBI investigation, the U.S. Attorney said, in part, "the results of the investigation revealed no violations of federal law, either in the purchase of the system or its present operation, and that as far as (t)his office is concerned, the matter is closed."

In preparing the column, Taylor did not contact us nor, we understand, did he bother to contact the fiscal officers of either the City of Detroit or the Detroit Public Schools.

In short, Taylor's article was so incomplete and slanted that readers should dismiss it out of hand.

Taylor's clear implication that we participated in "payoffs under the table to board members," however, demands more than a simple dismissal. We unequivocally declare this totally unsubstantiated and irresponsible implication to be false.

Richard L. Measelle
Arthur Andersen & Co.
Detroit, Mich.

Pleased With Andersen

Alan Taylor stated in a recent column [CW, Oct. 30] that Arthur Andersen & Co. was cited for unethical practices because of consulting services the firm provided to the Detroit Board of Education without competitive bids.

Historically, the Board of Education has not solicited competitive bids for professional services provided by architects, attorneys, physicians, management consultants and others. The selection process is based upon an evaluation of the professional competence and technical ability of the firm in providing the required services at a reasonable cost.

Over the years, the Board of Education has utilized the consulting services of several of the leading firms in the audit field.

In addition to Arthur Andersen's work on the district payroll system, the firm has served as board auditors since 1971-72. Its bid of $12,500 for the 1971-72 audit was substantially below the next low bidder. The audit fees the firm has charged since then have been well below prevailing rates for such services.

The school district has been satisfied with the professional services that Arthur Andersen & Co. as well as other consulting firms have provided.

Clement S. Sutton
Chief Fiscal Officer
Detroit Public Schools
Detroit, Mich.

A Cow of a Different Color

You must have sent one of them city fellers up to Essex Junction, Vt., to cover the new IBM plant [CW, Nov. 6], and he blew it. Oh, the 64K-bit chip is interesting enough, but the real news is that IBM has gone into genetic engineering and produced, not just one, but "herds of black and white. . . Jersey cows."

Holsteins are black and white, Guernseys are red and white and Jerseys are sort of fawn-colored.

Stuart R, Sheedy
Syosset, N.Y.

The Human Connection

Self-Awareness Training Enlivens DPers

By Jack Stone
And Joan Hendrickson
Special to CW

Last week Joan Hendrickson gave her impressions of DPers as she tried to find them love mates. She has the unusual occupation of matchmaker for professional peole.

This week she tells about another, rather overwhelming experience she had at an intensive self-awareness seminar that sharpened her beliefs about how peole can and should communicate. By chance, a number of DPers attended, and she learned some very interesting things about them in this social environment. Here is how she expressed her perceptions of her experiences at the seminar to me:

I discovered after I enrolled in the seminar that my decision to join the program evolved in a manner similar to that of many other attendees.

One day an old friend stopped by to visit. I hadn't seen him for a long time. But somehow, he seemed very different. He was far more open and interested in me as a person than before.

He told me his life had changed: he'd never been so happy; he'd never made so much money before nor felt so successful. He attributed all this to his experience at a self-awareness seminar. If he had five days to live over again, he said, it would be the days he spent at that session.

Quite honestly, it may sound crass to you, but I enrolled because I thought it would be great to make a lot of money and enjoy five days so much as to want to live them over.

Let me focus on my perceptions of DPers over the course of the seminar. As I said last week, it has been my experience that DP people are particularly amenable to stereotyping. Well, I proved this to myself again.

DPers Discovered

When the training session began, we only used our first names and did not discuss our professions. However, early on, after I observed the other attendees participating in the exercises, I strongly suspected particular ones must be computer people. Later on, I found I was right.

The reason for my judgment was that these people uniformly spoke quietly, coldly and deliberately, probably only after long moments of reflection and analysis.

Another commonality was their seemingly lifeless expressions as they talked about or listened to very exciting situations.

I initially thought, "Good grief! If they are really computer people, we're going to have to wait while they go through all that analyzing."

I was surprised they would come to the seminar at all — that they had any willingness to communicate about themselves and others in open, human ways or to learn how. Heaven knows, if there is one group that needs help dealing with others in a feeling kind of way, it is computer people.

The seminar I attended gave us opportunities to see ourselves and others in new ways. Everyone there grew in his ability to understand his own feelings and relate them to others. Each person was able to accomplish this only after he recognized his needs are the same as those of everyone else.

The attendees began to express their real feelings to others in the group. It was easy to do this because the entire group gave its wholehearted support. Frankly, it was a most thrilling experience.

The progress made by the computer people was particularly impressive. Their faces became alive; their voices strengthened; their gestures became more animated and relaxed; they even exhibited a great deal of warmth. For the first time, I saw love in the face of a computer person!

Joan Hendrickson is a copresident of the Georgetown Connection of Washington, D.C.

The Taylor Report

Better Guarantee Needed In NCR's Agreement

By Alan Taylor
Special to CW

Contracts of any kind should be clear, and the NCR Corp. universal contract is not. The letter of Ben E. Olive, NCR's associate general counsel [CW, Oct. 30] misrepresented the terms of the Universal Agreement.

Olive said: "The Universal Agreement states very clearly (except possibly to Taylor) that upon resale, the customer can transfer the software if a second owner agrees to protect NCR's legitimate proprietary rights and trade secrets."

Unfortunately Olive leaves out some vital, prior conditions. This is what it says in my copy:

"In the event that customer desires to sell purchased equipment to a third party, customer may not transfer or provide such data or material to the purchaser from customer without the prior agreement of NCR, which shall be granted if, and only if, the purchaser:

1. "Shall have agreed in writing that it will retain such in confidence to the same extent as provided in this section 10.

2. "Agrees to the continued payment of periodic license fees and/or the payment of any relicense fee in effect at the time of the transfer.

"NCR shall also have and may accumulatively exercise such further rights as it might have at law or in equity in such cases."

Prior Permission Vital

For example, NCR Customer A has some equipment he wishes to sell to potential Buyer B. Can he include the firmware in the sale? Clearly, not. That would be a "transfer" of the firmware without NCR's prior permission.

As NCR will agree "if and only if" prior permission is obtained, the fact that Buyer B is prepared to sign those NCR papers means nothing. NCR can, if it chooses under the last sentence of the quoted clause, seek an equity injunction against Buyer B from using the firmware. I think NCR would win, too.

Permission from NCR is therefore vital prior to transfer.

Olive also forgot to tell CW readers about the possibility of relicense fees and when they are computed. Therein lies the next "Catch-22" trap in the Universal Agreement.

After receiving the application for transfer permission, NCR can change the license fee. It can then send out its own salesman, who can offer equipment cheaper to Buyer B. (There is nothing in the Universal Agreement that states NCR will only sell equipment at list price.)

Imagine that on Dec. 1, NCR Customer A agrees to sell some three-year-old equipment, with a list price of $100,000, to Buyer B for $50,000 with the transfer to take place on Jan. 1.

Buyer B agrees in writing to pay the relicense fee on the equipment, and the agreement is sent to NCR, where it lands on Olive's desk. It might then be sent to the product manager or some other "line" person who realizes some-

(Continued on Page 22)

White Hat, Black Hat

IBM Technology Goodies Coming Out of Closet

By Herb Grosch
Special to CW

For some years, IBM watchers have been divided on the tremendously important question of Armonk's commitment to advanced technology. We all read and recited the expenditures for R&D announced each year in corporate documents. And we believed them.

In fact, I've always felt much of software development cost is excluded from the figures in the IBM Annual Report and the total R&D expenditure is now close to $2 billion a year.

It depends on how one views the writing of programs: is it "production"? Or is production the duplication of the program and documentation for distribution to customers? If you buy the latter idea, then writing the awful stuff is development and huge additions to the corporate figures are necessary.

But anyhow, give or take a few hundred million a year (say, Hitachi Ltd.'s total annual computer sales), the Grim-Gray Giant is spending nearly 10% of income for futures. The question was, lacking the Messianic leadership of Watson Senior and the courage of The Two Yachtsmen, would IBM ever let us see the results of all that research?

Somewhere in an infinity of back rooms in Yorktown Heights and San Jose and La Gaude and Boblingen, there were superchips, charge-coupled devices (CCD), bubbles and tiny holograms, optical fibers and bicycle-powered receiving antennas and weird languages undreamed of by Cobol customers. But would they ever emerge?

I claimed they would, when the marketing climate was right. I pointed to the innards of the 5100 desktop computer that depended on an unpublicized 48K chip assembly for its dumb Basic and its curious APL. That was in mass production years ago — about two chip-generations back, when the Motorolas and the Fairchilds were still having trouble with their 4K chippery. There were hints of microcode advances and, of course, the obvious necessities of the new Satellite Business Systems adventures.

Other Outlooks

Others thought the old pattern of innovation and customer-trampling, which climaxed at the 360 announcement in 1964, would never be repeated. They pointed to repeated promises from Frank Cary and lesser breeds that the bucket would not be brutally kicked over as Vin Learson had ordered in that fateful year.

They pointed to my own old argument that IBM was the only one of the major computer firms that would lose gross business if it introduced much more hang for a buck — that is, it was the only firm for which an increase in market share could not be large enough to offset a reduction in income from its current customers.

Touche! But I had usually gone on to say that this meant more layers of even gummier software

(Continued on Page 24)

DP Industry Should Back Larger Zip Code

By Van H. Seagraves

Special to CW

The negative editorial reaction [CW, Oct. 9] to the U.S. Postal Service's plans for adding four additional digits to the Zip Code came as a surprise.

It was startling because I cannot imagine that a publication covering one of America's most creative and fastest growing industries should focus on programming problems instead of how the computer industry can meet this challenge and help the mailing industries reduce costs.

The Postal Service has stated that by 1981 it expects to establish systems for the new Zip Code program. And, by 1983 we anticipate that customers will be voluntarily adding the numbers to their mailing address and that our optical character readers will be distributing mail to carrier routes.

This means that DP managers have four years in which to rewrite programs, develop formats and make the other changes the expanded Zip Code will require.

I suspect that in most organizations a number of changes will be made in programs to accommodate new forms, fresh data requirements and other needs of management. Persons responsible for large mailing lists tell me that with four years of lead time they won't have a bit of trouble including the expanded Zip Code in their programs. They do not feel the conversion costs will be significant.

These mailing industry managers understand the limitations of our present Zip Code and the costs of manually keying or sorting each letter many times as it travels along the mail stream.

Reader Commentary

A large percentage of the 55 billion pieces of letter mail handled yearly has computer-generated addresses or are preprinted reply envelopes. This is the primary "market" for the expanded Zip Code.

With the full Zip Code, optical character readers will be able to sort letters at a high speed right down to letter carrier routes and box sections.

Today's Zip Code does not permit such a fine sortation. It is costly for us to train clerks to memorize the specific blocks and sides of street served by each carrier. And, it is expensive for those mailing industries which maintain addresses by carrier routes to change their schemes when the Postal Service adjusts boundaries of the routes.

The expanded Zip Code will give the computer industry another opportunity to demonstrate how it can increase the efficiency with which mail is delivered and hold the line on escalating postal rates.

Seogroves is editor of the U.S. Postol Service's "Memo to Moilers."

Contract Needs Better Guarantees

(Continued from Poge 21)

one is willing to pay $50,000 for three-year-old equipment.

Off goes the NCR salesman to see Buyer B. Now the salesman can offer firm delivery. NCR Customer A cannot; he has to wait until NCR gets around to approving the transfer.

Nothing in the Universal Agreement says this approval must be given in 10 days, in a month or in any specific time. The NCR lawyers left out that important figure, just as they left out of the agreement many other customer protection features.

By delaying, NCR can force a renegotiation between the parties that may contribute to the stoppage of the deal.

Meanwhile, the NCR salesman can offer cut prices, firm delivery and intermediate backup. He might also tell Buyer B that if he keeps his old agreement, he won't know until after the transfer occurs what the total cost will be since NCR can introduce a relicense fee.

Relicense Fee Danger

Suppose the "Director of Price Changes" sends out a memo on Dec. 31 that the relicense fee for the equipment is 75% of the $100,000 list price. Meanwhile, the transfer between NCR Customer A and Buyer B takes place.

NCR can then proceed in law and equity against Buyer B for $75,000 under the terms of the quoted clause of the agreement, if the software is included in that transfer on Jan. 1. Again, I think NCR would win its claim against Buyer B.

I find it disconcerting that at this point it appears NCR will go to court rather than to an arbitrator. Most arbitrators I know would not like to receive a signed agreement for payment of some unknowable fee, but the judicial system proceeds on the idea that people *mean* what they sign.

Keep in mind that NCR can drop its equipment price fairly low. Even If the equipment were brand new, the actual cost of producing that equipment is 20% below list price.

The real issue now is whether NCR, after instructing its lawyers to say that anyone can transfer equipment without its good will, will live up to this expectation. This would entail changing its universal contract to provide the user with more substantial guarantees, including the promise that NCR will not destroy the value to its customers of the purchased equipment.

After sending the letter to Computer*world*, NCR may find it appropriate to at least show me in black and white where these guarantees are and how they are superior to most others.

I have an idea. Let's get together — with the meeting properly recorded — to discuss what the Universal Agreement says now and what is needed to give NCR customers the rights the company obviously wants them to have.

As it stands, the Universal Agreement certainly does not make those rights clear.

Let's set a date for publishing a new universal agreement with the customers' rights written clearly and boldly into it.

I would suggest a new section starting, "Notwithstanding anything written elsewhere in this agreement, NCR guarantees customers the right to resell equipment, to never make a move to hurt the value of such equipment — or threaten to do so — by restricting maintenance contracts, spare part supplies, firmware or by informing its sales force of the identity of prospective buyers . . . "

How about it, NCR? When and where shall we meet? How about New York — but not Buffalo — Syracuse is about halfway between us, so why not there?

HOW COME IT'S ?
IT WAS ONLY YESTERDAY!

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Common Communications Barrier

DPers Caught Up in Third Party Syndrome

By Jim Ryan
Special to CW

We are all familiar with the problem of making contact by telephone. The probability of directly reaching even a minor executive is quite low — in fact, almost nonexistent.

Usually we are greeted by a secretary, receptionist or switchboard operator and we begin the guessing game as to how much time we should waste in establishing communication. In the worst case, the party at the other end encourages discussion only to inform you after an extensive conversation that they cannot help and that they will have their party call you back as soon as possible.

A second situation is that of the level-conscious executive who carefully instructs a secretary on the protocol to be followed if and when the other party is on the line. This could be ludicrous if it weren't such a tragic waste of time.

Both of these cases are examples of the "third party syndrome" in which direct contact between two people is confused or delayed by a third party.

The above cases are only minor nuisance conditions and most of us have learned to live with them. However, there are real problems associated with the syndrome and they often involve computers and DPers.

The problem is more apparent if we think in terms of the ultimate consumers as they relate to the providers of a service or product. Under these conditions, computers and DPers are nearly always the third party.

The only exception is in those cases where the consumer actually defines the problem, obtains the necessary hardware, writes the software and operates the machine to obtain the desired output.

This usually applies only to either very simple applications or to mathematical problems. In all other cases, teams of specialists are required to bridge the gap between provides and consumers.

Reason for Complexity

This complex arrangement has become necessary because of the high level of DP technology required in today's industries and government agencies. When it works well, it is a highly efficient operation capable of processing many applications at very low cost. When it works poorly, all of the horrors associated with the third party syndrome become painfully apparent.

It has reached such proportions today that many people actually weigh the time and effort to obtain satisfaction on a given complaint against the probable result, then give up the chase and accept their losses or dissatisfaction as the price to be paid for modern living.

This is in spite of the fact that many large organizations have realized they will ultimately fail if they do not serve their customers well. They have set up all kinds of direct contacts for consumers including high priority to letters addressed to the President and special consumer advocates.

Even with all of these special arrangements, we still find newspapers providing special columns to solve customers' problems because of the ineffectiveness of direct contact.

In many cases, the reason both the consumer and the consumer advocate give up in despair when a computer is involved is because they do not know how to work with computers or DPers. They have no conception of the process involved in the input, processing and output of information. At the very best, they can operate a CRT device that will tell them the status of a situation, but in only a few cases can the consumer advocate cause any changes. The ultimate consumer is never allowed access to a computer.

Reader Commentary

Our DP friends will justify this position quite correctly by saying that inexperienced people, given access to a computer, can create havoc in a very short time.

Frustration Remains

The problem, however, remains and the consumer continues to be frustrated as soon as the word computer is mentioned. Unfortunately the consumer's complaint is also justified because often it takes months and large amounts of verbal and written communication to resolve a computer problem which is actually not the fault of the computer itself, but is the result of faulty input information.

The answer seems to be a requirement for a new generation of consumer advocate people who understand the principles of computer operations so that they know how to cause changes in the DP systems.

To protect the integrity of a computer process, it will always be necessary for the DP center to have absolute control over the computer system, but the difference should be that the consumer or consumer advocate should have more access to, and the ability to communicate intelligently with, the DP center.

The present "Keep Out" signs on computer rooms have denied any kind of access by the consumer or the consumer advocate. This has created a mental attitude on the part of many DPers that must be changed if the consumer is to be able to communicate with them. The consumer must also be taught how to phrase the proper questions at the proper time if contact is to be made.

At the present time, a number of service-oriented organizations have at least partially implemented this concept. It is a great pleasure to write or call a corporation or government agency and have the first contact be a person who will accept a complaint and follow it through to the customer's satisfaction no matter how many departments or computers are involved.

A satisfied consumer will accept the need for one complaint, but the constant time-consuming frustration of repeated complaints on the same problem is what ultimately turns the consumer off.

Odd State of Affairs

It seems odd that at a time when most organizations are concerned about their public images, more time and effort is not being devoted to that very important consumer who ultimately will determine the image of any organization.

All executives would do well to test their operation periodically by taking a letter or telephone complaint and, assuming the customer's status, proceed to take the same course of action as the consumer was required to take, to determine exactly what happened. It might be a surprising experience; at least it would tell how a message from the top appears when it hits the firing line.

Too often, the executive takes a complaint and assigns its solution to a staff person who solves the problem using all of the authority of the executive. About all this does is to bolster the executive's ego.

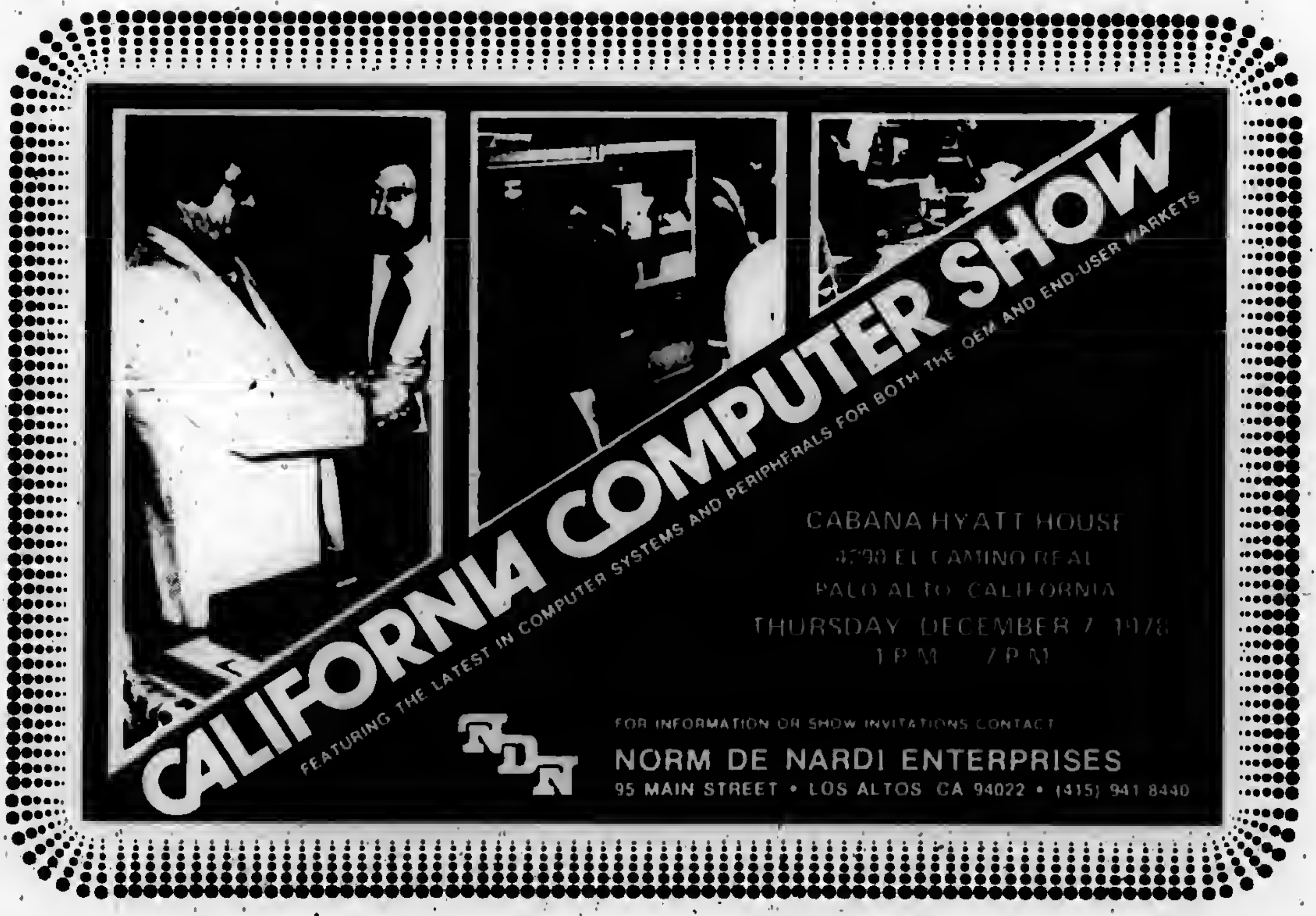
In a well-run, service-oriented organization, the executive will find that the firing line people are in fact doing a good job and that the consumer may actually be at fault.

If, however, a problem does surface, the executive should not immediately dismiss the person on the firing line. Many times the firing line has not been provided with the proper training or authority to solve the problem and it must be booted upstairs for answers, which indicates that authority has not been properly delegated.

For some vague reason, it seems that problems that are solved from the top down get more attention and better solutions than those being solved from the bottom up.

In any event, the third party syndrome is with us and must continue to remain with us in a complex society. It is present in all organizations, but the more there is of it the less effective the organization becomes.

Ryan is a retired DP user.



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IBM Bringing Advances Out of Its Laboratories

(Continued from Poge 21)

to reduce the effectiveness of radical new technology to an acceptably low level. The same ingenuity that produces a laser printer can produce Napoleon MVS (alternate layers of custard and crust)!

Anyhow, the argument is now resolved. The announcements of the last few weeks show that IBM is willing to unleash some of its laboratory miracles. We see promised mass production in major and complex systems and of 64K chips and 256K chip packages. And we see it from both of those increasingly competitive divisions, the Data Processing Division and the General Systems Division, indicating a common utilization of advanced materiel and clear management support from the Golden Boys upstairs.

My guess is that as customers and competitors poke around in the new 8100s and 38s, in the flood of new products coming in the next 12 months and as professionals and media people digest the information and announcements, dozens of high-technology novelties will surface. I expect whole new subsystems, notably a response to the recent CCD disk replacement offered by Storage Technology Corp.

The situation is very different from 1964, when an enormous number of new boxes all depended on a single component advance — the ceramic substrate with its three or four transistor-equivalents and the Fishkill factory that was first able to turn it out. Today there are a dozen novel phenomena in the IBM locker, from wall-domain magnetic bubbles to Josephson junctions. Since the 360, IBM has spent a fortune in its laboratories and development shops. The time has clearly arrived for us to see the practical results.

Why Now?

Why 1978 and 1979? Well, I'd point to a convergence of several influences. The internal pressures have mounted; having invented new machinery and new languages, the developers want to see them used; having become bored with the 370 and with System/3, the sales force calls for something fresh to peddle.

Then there is mounting competition, especially from the compatible mainframers — Amdahl Corp., Fujitsu Ltd., Itel Corp. and Hitachi. There is announcement of replacement operating systems, notably the huge one by Fujitsu. There is the Pascal enthusiasm and the enticing horrors of the new DOD language.

Above all, there is that other supergiant, Ma Bell. Since you have to go over telephone copper (or microwave, or optical fibers) to get to a bigger computer, why not let The Immortal System handle the whole job — direct the request wherever optimum facilities and availabilities indicate, with perfect compatibility and transparency? Now, there is a real threat! Down inside those impregnable Bell fortresses, the CPUs may well be Amdahl Corp. or Cray or — curses! — even Western Electric Co.

And finally, it's time. There is a genuine rhythm to any system, whether chip generations [two years], necktie widths, the sunspot cycle or airline luxury. The 360/370 basic architecture may well be immutable, as a recent *Computerworld* lead editorial [Oct. 23] claimed. But that structure is now so far down below layers of operating systems, job entry languages and specialist software, and masked by networking and multiplexing, that change can again occur, according to the fundamental mainframe cycle of what I now hold to be 12 or 14 years: from the early Twenties to 1938 for the old black punched card machines, from 1938 to 1950 for the relay machines and on-off tube experiments, from 1950 to 1964 for the long-word-length, single component systems and from 1964 to right about now for the Byte Generation.

Microprocessors and even minis may have a different rhythm, but it is much too soon to tell. But I doubt it, because the fundamental pulse is that of human impatience and human inventiveness modulated somewhat by economics. We see it in air transport, we see it in skirt lengths and we're surrounded by it in computer art.

So IBM innovation has come out of the closet. For customers, especially large customers, the next year or so will be a time of frantic reassessment — a time of new balances between IBM, the Bell System, the other mainframers, the Kompatibility Kids, the Peripheral People, the Distributed Devotees and the language fanatics.

The latest Japanese releases indicate the gap between Fujitsu and Hitachi, and Burroughs Corp., Control Data Corp. and Univac has closed. But the recent announcements and the sounds of the north wind rising against the mountains tell us IBM is still strong, agile and full of surprises. And they tell us many of those surprises will be couched in high technology.

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And Enhances 'Com-Plete'

Software AG Offers Dial-Up Debugging

By Don Leavitt
CW Staff

RESTON, Va. — Substantial, individualized technical support for software — similar in concept to facilities that vendors like IBM and Amdahl Corp. have touted for hardware maintenance — is now being offered users of Com-Plete, the teleprocessing and program development system, or Adabas, the data base management system, from Software AG.

Under the Instant On-Site Support plan, immediate technical assistance is available to Com-Plete or Adabas sites that provide a dial-up teletypewriter port on their IBM 370X or compatible transmission control unit, a spokesman said.

Virtually any software problem can be resolved quickly, without actual on-site assistance, through this facility, he said, noting that it allows the very best technician Software AG has available, regardless of where he might be, to go to work on the problem as if he were in fact at the user's installation.

The vendor technician can examine memory, memory dumps, JCL, user programs, control blocks, system queues — and, obviously, Com-Plete or Adabas code — from any location at which he has a terminal. Thus, debugging can get under way without delays caused by shipping memory dumps to some central location, the spokesman noted.

Security is provided to prevent unauthorized access to the user's data while it is reviewed under Instant On-Site Support, he added.

(This terminal-oriented software support appears to be directly comparable to one of the facilities available to users, software firms and consultants with CAP Microsoft's Viewdata Terminal Program (VTP) to ease the interchange of messages, programs and data on the British Post Office Viewdata service [CW, Nov. 13].)

Enhanced 'Com-Plete'

The announcement of the dial-up maintenance coincided with Software AG's introduction of Version 3 of Com-Plete, which contains many enhancements in addition to Instant On-Site Support.

The update allows Com-Plete users to access Vsam data sets in native mode; there is no need for special CALLs from on-line programs, the spokesman said. The application program can simply code standard batch requests to get Vsam data from terminal-oriented runs, he went on.

(Continued on Page 26)

'Words' Backs Distributors

HUNTINGTON BEACH, Calif. — An inventory management system that reportedly combines the multiple aspects of the distribution industry into an integrated process, the Wyle On-Line Real-Time Distribution System (Words) software is available from Wyle Data Services for use on IBM 370s.

The system has been perfected during five years of operation in support of the distribution group of Wyle Laboratories, which is involved in the electronics industry, according to a spokesman. But Words should work just as well in other distribution operations including, for example, the automotive, electrical, and grocery industries, he added.

The software was designed for use in a highly volatile sales environment, he said, and it provides a "full complement" of operational advantages.

Words uses the latest developments in real-time processing to link multiple warehouse locations and to provide immediate access to inventory, sales orders, purchase orders and accounting data, the spokesman said.

He emphasized that Words is not the answer to every installation's needs. It would be a poor choice for a manufacturer, for example, since it does not include such basic facilities — for that user — as a bill of materials processor.

But the integration of the modules — the system includes about 150 programs, 50 of which are on-line — "brings together the most needed aspects of inventory management in one package [which should increase user] profitability through efficient work flow processing and minimize lost sales from dissatisfied customers," he claimed.

Written predominantly in BAL for use under DOS/VS on a 512K 370/138 or larger CPU with 400M bytes of disk space, four tape drives and a printer in addition to teleprocessing facilities, source code for Words can be acquired for "somewhere between $200,000 and $300,000," depending on the amount of installation support Wyle has to provide.

Ultimately, the price is negotiable, the spokesman said from 15302 Bolsa Chica Ave., Huntington Beach, Calif. 92647.

Work on Pascal Progressing

WASHINGTON, D.C. — The proposal to set a standard for the Pascal language [CW, Aug. 28] has struck a responsive chord within the American National Standards Institute (Ansi). A technical committee on Pascal has been approved to work under the X3 committee on computers and information processing.

Identified as X3J9, the new group's initial task is to prepare a proposal for standardization of Pascal and to obtain approval of the proposal, including a program of work to implement the proposal, from X3, according to X3 secretary William F. Hanrahan.

Committeee work will be aligned closely with various international efforts on behalf of standardizing the language, as well as with ongoing work in the U.S. federal government, domestic professional societies, equipment manufacturers and other interested parties, he said.

X3 has named Justin Walker of the National Bureau of Standards as the convener of X3J9's first meeting, currently scheduled for Tuesday morning, Dec. 19, at the offices of the Computer and Business Equipment Manufacturers Association (Cbema).

The committee is seeking active participation from users as well as developers of Pascal compilers. A permanent chairman will be elected out of those attending the December meeting, Hanrahan noted.

Interested people and organizational representatives are invited to contact Cathy A. Kachurik at Cbema/Standards, 1828 L St. N.W., Washington, D.C. 20036.

Looking for Views On Packages

Computerworld will publish a special report on application packages in January and, to make it as useful as possible, would welcome articles contributed by users outlining their experiences with packages and vendors.

Some installations still don't know what benefits to expect, realistically, from packages; how to check out what is available before they buy; what kind of problems they may encounter trying to install a package; or what kind of help they might get from the vendor.

These are the points the report will try to cover. Users can help with manuscripts limited to about 1,000 words (four typed, double-spaced pages). Please submit them by Dec. 20 to Don Leavitt, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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Software AG Adds Support For Users of 'Adabas,' 'Com-Plete'

(Continued from Page 25)

Version 3 also provides for larger thread sizes — up to 252K bytes — and performance enhancements for thread balancing and rollin/rollout management of tasks. Thread scheduling is based on activity rather than users or terminals assigned to the thread.

OS SPIE and SYSOUT support under Version 3 is said to provide additional debugging support for high-level languages. This facility allows ON CONDITION clauses in PL/I and DISPLAY, TRACE and EXHIBIT verbs in Cobol to be coded in on-line applications with appropriate handling of SYSOUT and SYSPRINT data sets, according to the spokesman.

Ten distinct message significance levels are provided in the Com-Plete update as well as new facilities for "cold," "warm" and "hot" restart of message switching and printout spooling, he said.

Com-Plete currently runs under OS-MFT or MVT, OS/VS1 and OS/SVS. It costs $60,000 but will go up to $90,000 as of Jan. 1.

Adabas users who do not have Com-Plete but would like the Instant On-Site Support for the DBMS can get it for an installation charge of $2,000 and $350/mo rental, payable annually.

The support is built into the updated version of Com-Plete, the spokesman reiterated from 11800 Sunrise Valley Drive, Reston, Va. 22091.

Hill Book Updated

BLUE BELL, Pa. — An updated, corrected and retypeset version of *The World of EDP Standards*, originally written by Margory Hill and published by Control Data Corp., has been prepared by Univac.

This is the third version of Hill's book, according to a spokesman for the American National Standards Institute. Hill's original edition, bound in red, was released in 1972. An updating effort by the National Bureau of Standards, in cooperation with CDC, resulted in 1976 in a blue-covered edition that suffered from "numerous errors and illegible material," Ansi said.

The latest update, costs $5 a copy, with quantity discounts available, from Director of Standards, Sperry Univac, MS C1-NE5, P.O. Box 500, Blue Bell, Pa. 19424.

Three Books List Programs In Basic

NORWALK, Conn. — The Standard Software Library is a series of books containing listings of programs written in Basic with complete documentation, published by Creative Computer Consultants, Inc.

Each volume in the series is devoted to a single application and the first three focus on accounting problems for small computers, according to a spokesman. These include general ledger (Volume 1), accounts payable (Volume 2) and payroll (Volume 3), he added.

All the programs were written in a level of Basic common to "practically all" current mini- and microcomputers, he said, and make it easy to make changes to fit special needs.

For each program, documentation includes an overview of its logic, a list of variables used, a description of required inputs and an illustrative example of the outputs generated. Comments are contained in all the programs.

Volume 1 costs $49.95 and should be available soon at computer stores throughout the country. It can also be ordered directly from Creative Computer Consultants, Inc., P.O. Box 2111, Norwalk, Conn. 06852.

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ITEL

On-Line Executive Runs on NCR CPUs

PLEASANT HILL, Calif. — Basic On-Line Support System 3 (Boss/3), an on-line executive, has been released by Century Analysis, Inc. to provide users of NCR Corp. Century 101 and larger CPUs with interactive processing and data entry capabilities.

The software was designed to provide an on-line system that can be developed by batch-oriented programmers, that enables the key entry responsibility to be returned to the user departments and whose cost can be offset by replacing existing data entry equipment, a spokesman explained.

Boss/3 includes one subsystem that supports all data entry functions — enter, verify, search and modify.

A second subsystem supports all CRT screen building functions and provides communications and file handling functions at a macro level. Taken together, the two subsystems enable the user to handle all modes of on-line operation, the spokesman claimed.

The package can be used on an NCR 101 or more powerful CPU with 45K of main memory plus 2K for every data entry terminal, "at least" 2K for each interactive terminal and space for file buffers, he said.

Boss/3 prices start at $11,000; an interface to run under VRX costs an additional $2,000 and a message-switching/broadcast faciliity is another $1,000.

Century Analysis, Inc. is at 3343 Vincent Road, Pleasant Hill, Calif. 94523.

[redacted]

UCC Updates File System For Banks

DALLAS — Version 5.3 of University Computing Co.'s Customer Information File System (UCC/CIF) provides for the development and maintenance of a multi-institutional multibranch cross-referenced central file for customer and account information and is generally intended for the banking environment.

Using a total system approach, the package gives its users a complete "scrubbing" series to prepare user files, customer key grading and selection prior to loading on-line files and versatility to permit ongoing application maintenance, a spokeswoman said.

Version 5.3's significant enhancements include a simplification to the conversion process, she noted. New programs can be added to analyze the user extract file and predict which words should be included in the format tables to achieve the best standardization of all incoming names and addresses.

Version 5.3 makes UCC/CIF on-line functions screen-size-independent. Error screen displays have been formatted to give more meaningful descriptions of error situations and users can tailor these messages, the spokeswoman continued.

The extended file inquiry added to Version 5.3 also provides inquiries that selectively list account cross-references, total balance data, display customer cross-reference data and display account data housed in the UCC/CIF subfiles.

UCC/CIF has been used in an OS/MVT environment on an IBM 360/65, utilizing UCC's data communications system, and in a DOS/VS setting with CICS on a 370/165.

UCC/CIF is modularly priced depending on operating system environment, including DOS, OS or IMS. It costs $25,000 to $72,000 depending on modules selected and is available from 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

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CLEVELAND - The first edition of "Survival Procedures for the Computer Jungle" has been completed. The 15-page bound satire is a great gift idea for Computer Professionals and Users. Special Sales Reps 5-page edition is available at low-cost.

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Notes and observations from IBM
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Users Take System Development Lead at Hartford National Bank

With competitive pressures and a volatile marketplace, the Hartford National Bank and Trust Company, Connecticut, must get new computer applications up and running fast. The involvement of users in the development process, and their ability to communicate with programmers and analysts, are both vital to meeting that need. Recently, managers of three departments at the bank that use DP services attended an IBM course, "Project Planning and Control for Users," that teaches users how to define and specify a computer application and share in control of its development.

"Today we spend much more time in the design phase of a project," says James Lenehan. "At first, we were concerned because we were expending more manhours before actual coding started. But with clear definition of the problem and continuous user participation, we needed much less time for test and signoff at the end, and we've been meeting our target dates."

At Hartford National Bank, users of data processing services now work closely with the application development staff. These managers are alumni of an IBM course in "Project Planning and Control for Users."

Lenehan is system development officer of the bank, the second largest in New England. Hartford National operates two IBM System/370 Model 158's, one with an Attached Processor. It has 65 applications scheduled for development this year.

One attendee, Richard Dennison, loan administration operations officer, reports: "We used the techniques taught in the course on a major online inquiry enhancement. In previous years, the first time we saw the programmer's interpretation of what was wanted was during quality assurance testing. Programs often needed twice the estimated amount of maintenance because we hadn't been able to define our requirements beforehand. With the IBM course under our belts, we users can participate in the design. We knew what we were getting before the system was installed, and we're pleased with it."

Philip Palrone, manager of trust accounting operations, agrees: "As a user who spends a great deal each year on development, I must take an active role in design. Today we speak the same language as the systems people. They meet their schedules, and the system we specify is the system they install."

According to Ken Klieback, manager of retail deposit operations, "when Marketing develops a new idea for a deposit account, we need the computer support for it installed fast, and the Project Planning course has been a big help. Recently we installed two new applications with only two or three days of testing.

"Among other things, the IBM course showed us how to communicate about systems. With the response I now get from the development people, I feel more like a customer in a business relationship."

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Financial planners at Kinney Shoe Corporation project capital requirements for the opening of 180 new stores a year. Each new store is a substantial capital venture in itself, involving interior design and construction, contracting for space, assembling an inventory, and adding or transferring a staff of people.

With the aid of an IBM program called A Departmental Reporting System (ADRS), Kinney planners can revise their projections quickly and as often as needed to accommodate schedule changes.

"We need to know what will happen to our capital requirements if we add a few stores to the schedule, or postpone one opening from the first to the third quarter," says Selig Adler, budget director for the major New York City-based shoe merchandiser, with 1600 retail stores across the U.S.

"To get the answers, we enter variable data through a computer terminal," Adler explains. "Ultimately the system will automatically pick up a large mass of basic fixed data, such as construction costs and pay rates, and perform the repetitive calculations. If we need to change the schedule of store openings – or just want to evaluate the effects of a proposed change – we can key in a new capital spending plan and get a revised printout of our financial plan in moments."

Adler and his fellow financial executives interact directly with an IBM System/370 Model 158 computer, using simple English-like commands to specify the desired reports and tables.

With ADRS, Adler is also able to develop detailed financial plans, weekly sales reports on Kinney and its competition, projections of sales and profit derived from past and present operating data, and other reports used by Kinney's top management in making operating decisions.

"Now I do a lot less pencil-pushing," Adler adds. "I can concentrate on what goes into a projection, and if something doesn't look right, I have time to decide which input needs changing. Often, I had to live with the first result because of time pressure. Now I can make last-minute revisions and get much better forecasts."

Says senior vice president Thomas E. Page: "We write these applications ourselves using ADRS, so we have them in days instead of months. Our planning documents are modified constantly as our needs change, or when management wants financial projections in more detail or differently organized. Now we can revise a format on the spot and obtain a new printed copy promptly. Kinney gets better information sooner and makes decisions on a more meaningful basis."

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DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

IBM
DATA PROCESSING DIVISION

Meet to Deal With Specifications

SILVER SPRINGS, Md. — The importance of developing detailed specifications during the early phases of software lifecycles is the topic of a conference to be held in Cambridge, Mass. in April.

Fifteen papers have already been submitted, ranging from a discussion of formal specification languages to speculations on the direction of future research, according to program chairman Marvin Zelkowitz of the University of Maryland.

A few papers "have trickled in" since the Nov. 1 deadline and two or three more are expected, he said, adding that authors will be notified of acceptance or rejection of their papers on or after Dec. 15.

The conference, described as "the first and probably the last of its kind," is sponsored by the Institute of Electrical and Electronics Engineers, Inc.'s (IEEE) Technical Committee on Software Engineering in cooperation with the Association for Computer Machinery (ACM), Zelkowitz said.

The idea for the conference germinated from the need to examine and identify reliable software products and will most likely concentrate on a user's need to verify the consistency and completeness of specifications.

Although plans for the sessions are going along smoothly, Zelkowitz admitted the conference presently lacks any definite symposium on user experiences.The planning board had hoped to incorporate panel discussions on actual case histories but will probably have to forego this because of a lack of interested participants.

Additional information on the specifications conference and a complete advance program can be obtained from the conference director, P.O. Box 639, Silver Springs, Md.

Data Base Future Examined

MAIDENHEAD, England — A decision to "go data base" usually involves a 10-year investment in systems, software and staff, yet imminent technological developments could make existing data base systems obsolete, according to a spokesman for Infotech International Ltd.

To provide users and potential users of data base systems with at least a guide to that area of software, Infotech has recently published one of its State-of-the-Art reports entitled "Data Base Technology."

In the book, a panel of international consultants examines the immediate future for data base management systems, assesses the practical effects of forthcoming developments and suggests steps that can be taken now to benefit, rather than suffer, from new technology, the spokesman explained.

The two volume, 840-page publication is available outside the U.S. for 120 British pounds, from Infotech International Ltd., Nicholson House, Maidenhead, Berks, SL6 1LD, England. In the U.S., the book is available for $260 from Auerbach Publishers, Inc., 6560 N. Park Drive, Pennsauken, N.J. 08109.

Self-Study Courses Offered

WELLESLEY, Mass. — Under terms of an agreement with John Wiley and Sons, Inc., QED Information Sciences has acquired rights to distribute selected courses from Wiley's Professional Development Program to the DP community.

The courses selected include How to Develop Dynamic Leadership, How to Manage People at Work, Effective Presentation, Successful Writing, Managerial Accounting and two courses in Modern Production Accounting, a QED spokesman said.

These choices are particularly relevant to DP professionals, he claimed, since the first four are directed at specialists who have reached management positions because of technical; not management, skills and the last two providehelp to analysts and designers in dealing with the business world.

Each course costs $34.95 ($31.95 prepaid) and can be ordered from QED at P.O. Box 181, 141 Linden St., Wellesley, Mass. 02181.

PL/I Added To 'Test/IMS'

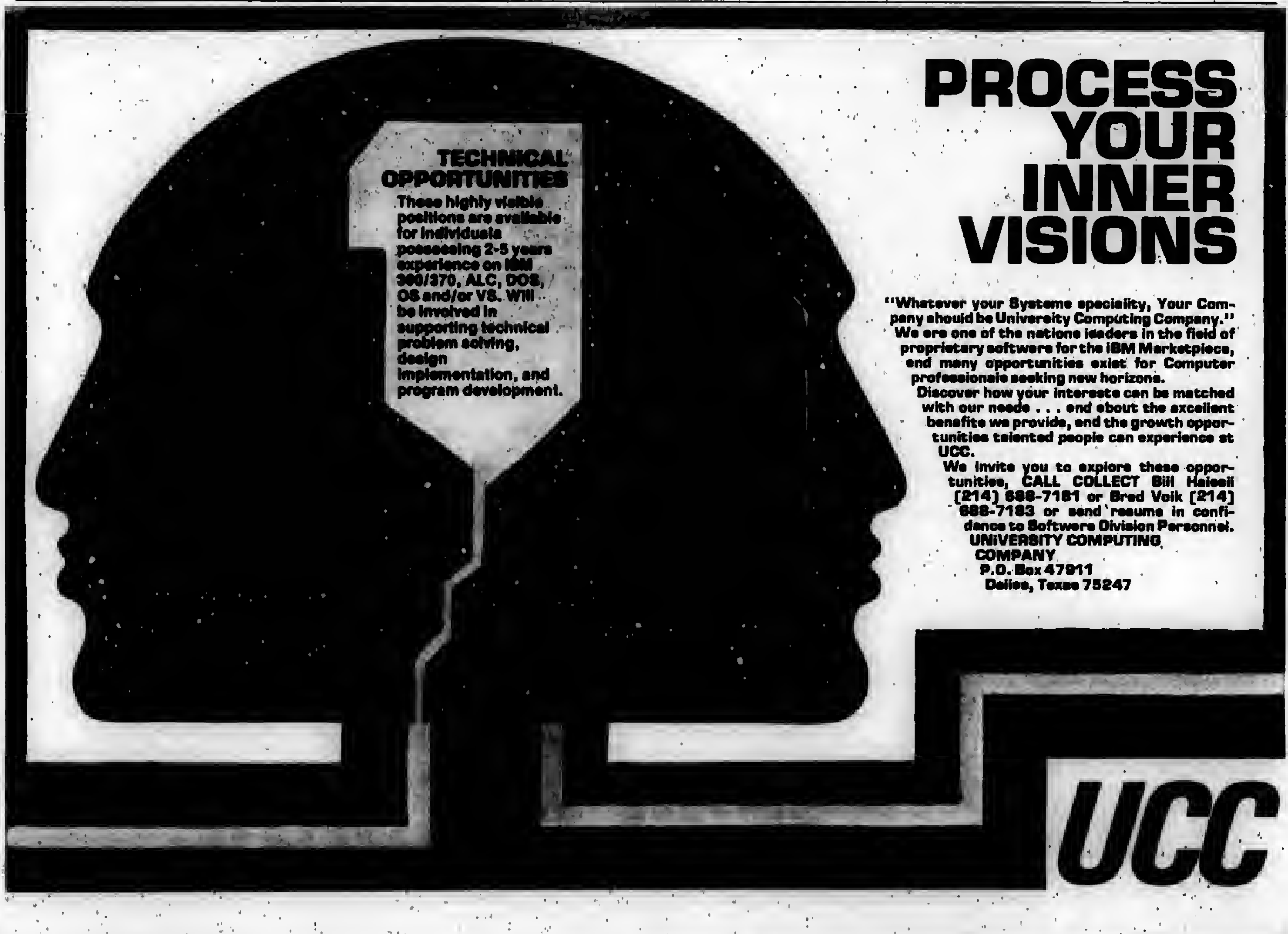
SACRAMENTO, Calif.— Support for PL/I used as a host language (to go along with existing Assembler and Cobol capabilities) has been added to the Test/IMS package, according to the vendor, Software Module Marketing (SMM).

Developed by Chicago Data Systems, Inc., the package was described as a full-facility, on-line test system for IBM's IMS data base management system. It supports "session testing," allowing many different, possibly unrelated program errors to be identified in a single execution, a spokesman said.

It intercepts program checks that might otherwise lead to Abends and resolves them if it can, logging the changes made to simplify later debugging. It then continues the test run as if the program check had not occurred, he explained.

Test/IMS facilities include DL/1 CALL parameter verification, DL/1 status code checking and the printing of IMS and program interface information including I/O areas, teleprocessing and data base control blocks and a formatted hex and character memory dump, the spokesman continued.

Written in Cobol and assembler for use under OS or OS/VS, the package costs $12,000 from SMM in the Crocker Bank Building Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.



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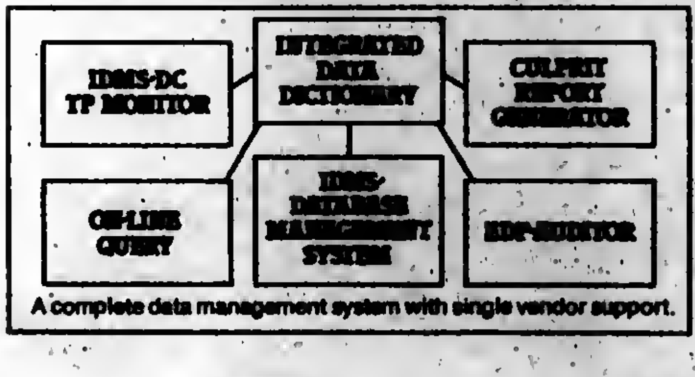

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Researchers Face Special DBMS Design Needs

By Richard J. Trilling
Special to CW

Certain features of the research environment critically affect the design and selection of a data base management system (DBMS) and may make the application of a commercial DBMS risky or inappropriate. In fact, features of the research environment probably constitute a superset of the features of the commercial environment, so a DBMS designed to meet the needs of the latter may fail to satisfy the needs of the former.

The ideas presented in this paper have been developed while working under contract to the U.S. Environmental Protection Agency on its Cleans Clever project. This project was designed to determine the effects of toxicological air pollutants on human immunological and biochemical systems and physiological performance and involves thousands of variables and many megabytes of data.

Following are some essential design considerations:

- In the commercial environment, use of a data base usually involves extracting a subfile of cases that meet certain key criteria in order to enumerate those cases or retrieve their records. In the research environment, on the other hand, use of a data base usually involves extracting a subfile of cases that meet certain key criterla in order to analyze cause-effect relationships among other, nonkey variables.
- For a data base to support research, it should be flexible enough to answer any conceivable question the researcher might ask of the data. Any variable, in other words, may be used as a "key" variable, and any query may be followed with a query requiring a different set of variables.

A query may involve any combination of several thousand variables. Flexibility is essential because the choice of one query depends on the result of the previous query.

- Research data is worthless unless statistical analysis is possible. The data base must therefore permit statistical analysis either by being accessed directly by statistical routines or by permitting easy transfer of data to statistical routines. The statistical routines should be easy to use, understandable, reliable and statistically sophisticated.
- A wide variety of data types is to be expected in the research environment, including integer, floating point, character and perhaps also date and time.
- A wide variety of record formats is also to be expected, including specifically the possibility of repeating groups (multiple measurements).
- The nature of research is such that multiple versions of the data base may exist at any one moment in time. The evolution of the data base may change the numbers of cases or missing data used in analysis. Making these multiple versions must be easy, but keeping track of them and documenting them is of utmost importance. Conclusions based on one version of the data base must be replicable.

Unlike most commercial users who need only the latest value of a variable, research users must know at all times which versions of the data base are in existence at any moment in time; which version the user is using; how each version differs from all others; and which versions are associated with which published reports.

- Multiple algorithms may have been used to produce similar data. In fact, one purpose of the research may be to compare the algorithms. Redundancy may be a virtue, not a vice.
- Research data often resides within the public domain even though there may be a privacy contract that the subject's data not be revealed without the subject's permission.

As part of the public domain, the data in the data base must be accessible easily and reliably to any legitimate user. However, out-of-house users may request copies of the data base if the data are worthwhile and if the analysis is noteworthy.

It should be possible to make copies of the data base without considerable delay, cost or inconvenience. No request should be honored, however, which in any way tries to violate the privacy of subjects who participated in the project.

In general, access to the data base must be fast and easy, but must at all times be under close scrutiny.

- As in the commercial setting, different levels of access for different classes of users must be maintained even in the research setting.
- Integrity (data safety) is a vital concern with projects that generate data for the purpose of writing public law. Data must be protected against inadvertent or other tampering. Documented versions of the data base must be recoverable upon demand. Analyses must be replicable.

Note that in the research setting, integrity is of considerably more importance than is security, whereas in the commercial setting, integrity and security are probably of equal importance.

- Research data that constitutes an archive must be maintained, fully documented, updated and kept accessible not only to researchers in-house but also to outside researchers who may desire to answer specific research questions or engage in large-scale scientific research projects involving secondary analysis of the data.
- Interactive use of the data base would be especially beneficial for the researcher wishing to navigate through the data formulating or refining hypotheses along the way. This mode is not vital but nevertheless would eliminate the need to communicate with the data base through a computer programmer or to tolerate the delays of batch mode.
- A graphics capability would provide hard-copy evidence of distributions and relationships and, in interactive mode, would offer a tool to help the researcher determine whether the distributions and relationships discovered by navigating through the data base warrant further exploration.
- Standard utilities should be available to permit audits of transactions with the data

(Continued on Page 32)

Package Aids Wang Users' Accounting

GRANTS PASS, Ore. — Users of Wang Laboratories, Inc. "T" and PCS II systems can now run their basic accounting work with a "high degree of user control and design" by utilizing the General Ledger 101 (G/L 101) package from Data Train, Inc. (DTI), according to a spokesman.

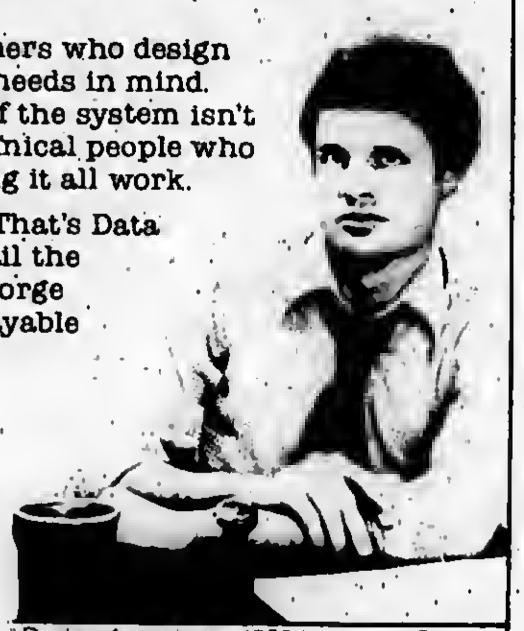
All necessary accounting reports and audit trails are included and the user may format the financial statements to meet internal or customer needs. The system provides balance sheets, comparative balance sheets, profit and loss statements, comparative profit and loss and change in financial position reports, he said.

The standard reports may contain up to eight columns of data, but special reports may be designed and generated through the package's report writer feature, the spokesman noted.

Typical limits on the Wang dual floppy-disk configuration currently supported are 2,000 monthly posted transactions with 500 general ledger accounts but the disbursement is under user control, the spokesman added.

Distributed in object code, G/L 100 costs $850 and is available from DTI at Suite 3, 840 N.W. Sixth St., Grants Pass, Ore. 97526.

"A good accounts payable/ purchase control system is more than just software."



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Datagraphix Enhances Package for COM Units

SAN DIEGO, Calif. — Direct access file management capabilities and expanded job accounting functions are part of a computer output microfilm (COM) package released by Datagraphix, Inc. for its Mini-Autocom and System 4500 minicomputer-controlled recorders.

Release 9.0 of Miniform utilizes an Advanced COM Executive (Ace) which replaces the previous stand-alone monitor control program and adds direct access facilities. The user can still access files sequentially, a spokeswoman stated, but is encouraged to convert to direct access formats.

The COM package also contains two utility programs. One converts sequential files to direct access and the other uses direct access methods for file listing, copying, deleting and updating, the spokeswoman added.

Other features of the release include a multiple character size option a disk-oriented initial program autoload; an optional real-time clock; and the addition of two input tape reformatting modules.

Release 9.0 also incorporates a memory driver that allows storage of index keys or job accounting records in a reserved portion of memory and an expanded label processing capability.

The COM software enhancement is free to prospective users of the firm's minicomputer-controlled line of recorders as well as to present users who want to update their facilities.

Additional information and specifications are available from Datagraphix, Inc., P.O. Box 82449, San Diego, Calif. 92138.

Macrocompiler Suits NCR 8200, Other Small Systems Using Cobol

TULSA, Okla. — Written in ANS Cobol 74 for use on NCR Corp.'s interactive 8200 series of small business systems, a Cobol Macrocompiler developed by Brad Jensen, CDP, should be easily transportable to any other small system using Cobol, he said.

The Cobol support was built around the Fastbol precompiler Jensen created two years ago to reduce the amount of coding needed, by allowing use of abbreviations, for example, that were expanded into full Cobol statements before the program was to be compiled.

To that, the developer has added both a macro-instruction generator and a cross-reference facility. Macros are, generally speaking, single-line instructions including a verb and various parameters which tailor a previously developed section of code to the specific situation and then insert that code in the user's program where the macro was written.

Jensen claims several advantages accrue through the use of macros. First, they are quicker to use than conventional Cobol coding, and second, since they utilize logic that has been previously developed and presumably debugged, they avoid the problem of untested code, he said.

The developer also claimed that macros can be created by anyone who can write Cobol code and who can follow the instructions provided in the user manual.

Object code for the Cobol Macrocompiler system — the macro generator, Fastbol and Xref — for NCR's IMOS environment on 8200 and 8450 CPUs costs $750.A user manual is available separately for $25, which is refundable if the software is ordered.

Jensen can be reached at 1419 S. Quincy, P.O. Box 4159, Tulsa, Okla. 74104.

Researchers' DBMS Needs Unique

(Continued from Page 31)

base; updating or editing of data in the data base; recovery from disasters; and of course altering the set of key variables available to the researcher for querying.

- A querying capability in an English-like language would enhance for the computer novice the research potential of the data base and in general facilitate the use of the data base.
- Interfaces of the DBMS with programming languages would be useful to permit more powerful manipulation of the data base by the user with computer programming sophistication.

More Demanding

Features of the research environment demand more of a DBMS than typical commercial products provide. To achieve the generality and flexibility required in the research environment, the DBMS no doubt must sacrifice something; usually performance.

The advantages of the hierarchical and network approaches to data base management derive from their ability to match certain (but not all) real-world examples. They gain in performance by sacrificing generality, but they sacrifice a generality that usually is not required in the commercial environment.

A general DBMS, probably a flat file or relational approach, is flexible enough to simulate any of the more specific models the hierarchical or network approaches are so well suited for, but probably without achieving the levels of performance attained by the hierarchical and network approaches.

On the other hand, the general DBMS required for the research setting will handle those applications the hierarchical and network approaches are not designed to handle. The designer must decide whether his needs fit the more restricted capabilities of the hierarchical and network approaches — which will then provide high performance — or require instead the more general capabilities typical of the research setting.

Trilling is with Rockwell International's Environmental Monitoring & Services Center in Durham, N.C.

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Bandwidth Conservation Urged

Cost Drops Linked to Line Efficiency

By Ronald A. Frank
CW Staff

HONOLULU — More efficient ways must be found to use existing communications links if the cost of data communications is to drop, according to David Horton, director of computer communications development at Hawaiian Telephone Co.

Bandwidth is a form of energy and must be conserved through more efficient use of existing facilities and improved tariff structures, Horton said in a recent interview here.

An example of an area in which efficiencies are possible is private-line networks. Private-line tariffs were initially a response to the threat of private microwave systems, but private-line users tie up a line for 24 hours — whether or not he utilizes it — and this is not efficient, Horton pointed out.

One solution to wasteful allocation of bandwidth is the integration of services, he suggested, acknowledging this is difficult. Packetized and digitized voice is one type of integrated service that will be available in about five years, he predicted, allowing alternate voice/data traffic to operate on packet nets.

While there are inefficiencies in private-line networks, Horton does not support a recent recommendation by Italian telecommunications experts to do away with flat-rate pricing in favor of volume-sensitive tariffed offerings. As alternative integrated services become available, private-line rates should rise, but they should remain priced on a flat-rate basis and not become time- or volume-sensitive, he said.

CW Photo by R. Frank

David Horton

A pioneer in the development of public data networks who helped implement the Dataroute and Datapac offerings in Canada, Horton once believed private-line nets were not needed at all. He has come to understand however, that they have their place in certain user applications, he said.

The evolution toward widespread availability of public nets got a big boost with the CCITT X.25 standard agreed upon several years ago, Horton noted. However, X.25 is now only a host-oriented interface, and other standards must be developed for terminal use of X.25 packet nets, he said.

AT&T's announcement of its Advanced Communications Service (ACS) goes a long way toward providing compatibility on a common network among terminals that now cannot talk to each other, he added. When ACS begins operation, it will inhibit the proliferation of terminals, he predicted.

The user will have to decide whether to use microcomputer-controlled terminals or existing terminals with ACS capabilities. The trade-off lies in whether the intelligence will reside in the terminal or in the network.

Proprietary barriers could be erected against the use of ACS if users do not want to entrust their corporate traffic to such a network, but this will be rare and most users will go along with the concept, he said.

As the ACS concept catches on, there may be a smaller demand for communications managers, Horton said, since much of their network configuration and operation responsibilities will shift to the carrier. These managers will still be needed to optimize costs, however.

Simpler Nets Coming

Terminal-based networks will be improved by simplification in the coming years, according to Horton, The average manager does not want to get involved with complex access methods, and today's executive wants to have a system that can accept voice input and provide CRT and hard-copy output with a minimum of effort; these capabilities are not that far off, he indicated.

AT&T will remain as a regulated — not competitive — carrier, Horton predicted. ACS will ultimately be viewed as a needed communications service with "some processing elements in it." The ACS proposal is not really a DP service at all, he added.

At present Hawaiian Telephone is connected to Telenet Communications Corp.'s packet-switched network, but will interconnect to ACS when it is operational. There is nothing to stop U.S. carriers from tying into packet nets provided by other vendors such as Telenet or Tymnet, Inc. if they really want to, he explained.

There is currently more intrastate than interstate data traffic, resulting in a need for carriers to offer intrastate public data network facilities, Horton said. Hawaiian Telephone is doing this in the Hawaiian Islands with its Dasnet service [CW, Oct. 16].

Police Forces in Great Britain Now Connected via a Network

HENDON, England — The Police National Computer (PNC) is now providing police forces in England, Scotland and Wales with immediate access day and night to an increasing amount of necessary information of national as well as local significance. The computer installation here at Hendon is linked to all police forces in the country by a terminal-based communications network that is operating with speed and reliability.

Information is held on the PNC in the form of separate indexes, each dealing with a particular subject. The information is designed to help police officers decide on an initial course of action and to provide a guide to the location of more detailed information which might subsequently be needed.

The indexes cover such categories as stolen vehicles, fingerprint data and wanted and missing persons.

PNC is believed to be one of the most advanced computer-controlled police networks in the world, and its success has been attributed to the coordinated efforts of the Home Office, local government and the police service.

A network of private lines provided by the British Post Office connects terminals in police stations and headquarters to the computer complex at Hendon: More than 500 terminals have been installed in police locations throughout the UK.

Links beween the PNC and local police computer systems are an additional feature of the network.

Two types of terminal devices are provided in each police force area. A form of semielectric teleprinter called a Dataprinter is used when a printed copy of an exchange of information with the computer is required by a police force. For all other purposes CRTs are provided. The CRTs are silent in operation and work faster than a Dataprinter, so they are preferred for operational work, and the number in service greatly exceeds the number of Dataprinters.

The latest is a Delta Data Systems Corp. Model 4050 terminal which includes a programmable microprocessor and up to 16K bytes of memory. It can perform I/O operations, text editing, memory management and

(Continued on Page 38)

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Docutel Upgrades Total Teller 300 ATM

DALLAS — Docutel Corp. has introduced the Total Teller 2300, an automated teller machine (ATM) that permits financial institutions to protect their investment in Docutel equipment, according to the vendor.

More than 900 financial institutions have already installed a total of more than 3,800 Docutel Total Teller 300 ATMs domestically.

For users who already have the Total Teller 300, the added components of the 2300 can be installed into the existing 300 vault. Users don't have to make any software changes, the firm said.

A financial institution can now have a Total Teller 300 for lower transaction volume locations, replace the Total Teller 300 parts with Total Teller 2300 components in high-transaction volume locations and buy the Total Teller 2300 as an ATM program expands, Docutel suggested.

The Total Teller 2300 includes its own intelligence with an expandable memory. If the host processor fails, the ATM continues to function, a spokesman noted.

The Total Teller 2300 includes a two-denomination bill dispenser with a capacity of 4,400 new bills. Specifically designed for used currency, it needs no adjustments to handle new, used or mixed bills.

The Total Teller 2300 printers have larger capacities than existing equipment. The customer receipt printer is balanced with the money supply to minimize restocking and to meet the weekend demand.

The cost of supplies for the 2300 has also been reduced; $80 should cover supply costs for 50,000 transactions, the firm said.

Other improvements include a more durable card handler and a touch-sensitive keyboard that eliminates the reliability problems of push-button microswitches, according to the spokesman.

Field upgrades of the Total Teller 300 cost $14,000 while a Total Teller 2300 is priced at $31,500. First deliveries are scheduled for April. Nationwide service is provided by TRW, Inc., the spokesman said.

Docutel can be reached through Box 222306, Dallas, Texas 75222.

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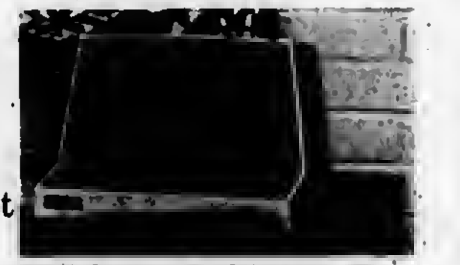

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You: How do I find out more about Randal?

Randal: We were hoping you'd ask that. Just call this number, (213) 320-8550, collect. Or fill out this form, mail it back to us, and we'll send you more information. It was nice talking with you.

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Bank Offers Programs to Run On BCS 90

FORT SMITH, Ark. — The First National Bank of Fort Smith is offering 75 software programs that support the Bunker Ramo Bank Control System (BCS) 90.

First National developed the programs under the standard Bunker Ramo Banktran transaction processing software to generate configuration tables and screen formats for most BCS 90-based teller terminals.

The teller terminals employ a built-in CRT screen to display customer data in real time, substantially reducing transaction time at the teller windows, the bank explained.

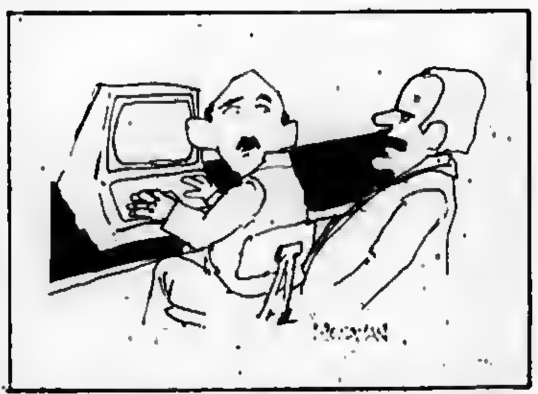
The Customer Information File (CIF), one program from the library, reportedly allows an authorized bank official to key in any one of five customer account numbers covering savings, checking, installment loans, certificates of deposit or commercial loans and display the entire file in summary form.

Other programs support query and memo posting, on-line data base creation and review; control of automated teller machines and large-screen graphics for displaying savings account statements, commercial loan listings and installment loan transactions.

With the exception of a few CIF and teleprocessing batch programs written in PL/1, all First National programs are in assembly coding, the spokesman said. Most of the programs are less than 4K bytes long, "with none longer than 8K bytes."

First National's central CPU is an IBM 370/135. The programs are stored on IBM 3340 disk drives with a total capacity in excess of 350M bytes. The operating system is DOS/VS with a Cics/VS telecommunications monitor and Power/VS spooler, the spokesman said.

The entire library of programs costs $50,000. The CIF program by itself costs $25,000, the BCS 90 control program is priced at $15,000 and the program to drive the automated tellers sells for $10,000, the bank said from 602 Garrison Ave., Fort Smith, Ark. 72901.



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preprogrammed function keys,
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We took a long, hard look at how you use a simple CRT terminal. We applied 10 years of experience producing sophisticated, high-performance computer products, so the newest member of HP's terminal family is engineered from just one point of view: yours.

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Interactive sessions go faster if you can look back at what you've already done. So we designed two full pages (48 80-character lines) of continuously scrolling memory into the 2621.

Recognize the 2621's keyboard? It's a lot like the familiar typewriter almost everyone's used to. Which makes the 2621 easier to learn, faster to use. And to accelerate keying in numbers, we put the numeric keypad right in the middle of the keyboard.

Then we increased the capability of the 2621's simple keyboard with eight special keys. In regular use, they control the cursor, rolling and scrolling. But they're also labelled on the screen with preprogrammed functions which, with a touch of the shift key, control self-testing, terminal configuration, display functions and editing.

Editing? On a simple CRT? Sure, because editing gets more work done faster. The 2621's comprehensive editing includes character and line insert and delete, clear line and clear display. What's more, the 2621 keeps your input separate from your CPU's so you can edit data before sending it to your CPU. And all without rewriting a line of your system's software.

And the 2621 is Bell 103A compatible and communicates with your CPU at 110 to 9600 baud through an RS232C interface. Which makes interfacing a snap.

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Try this on your favorite CRT: With the 2621P, you just hit a key and walk away in seconds with hard copy of your CRT display. The built-in thermal printer prints upper and lower case at up to 120 cps.

The 2621's bright, high-resolution CRT displays the full 128-character ASCII character set, including upper and lower case, control codes, and character-by-character underline, in 24 80-character lines.

Eight screen-labeled preprogrammed function keys magnify the power of the 2621's keyboard. Preprogrammed functions include editing, terminal configuration, printer control and self-test.

To make numeric data entry faster and easier, we put the 2621's numeric keypad right in the middle of the keyboard, instead of at one side.

The 2621's familiar 68-key keyboard is almost as easy to use as a typewriter.

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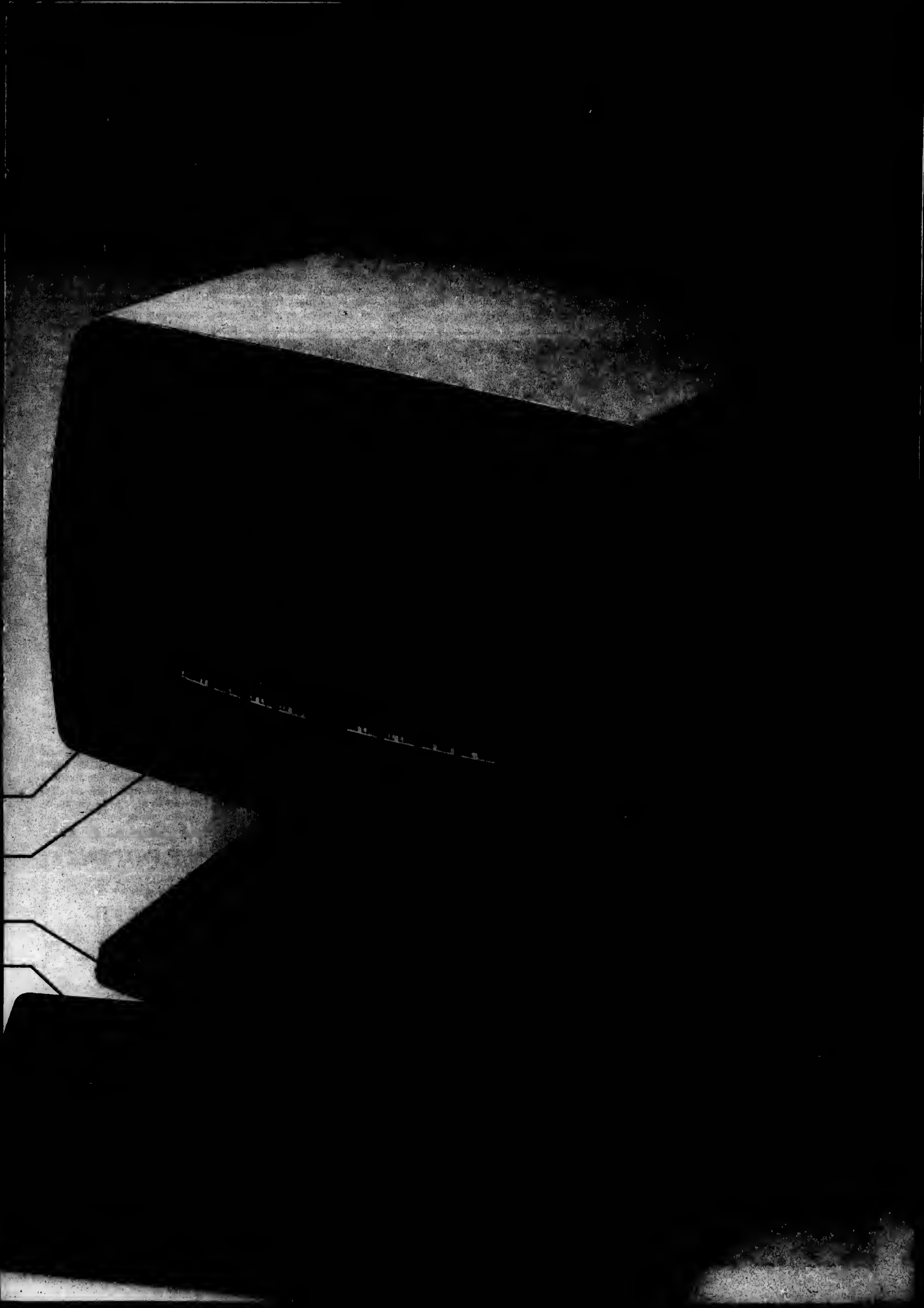

Net Links Police Throughout Great Britain

(Continued from Page 33)

interfacing operations; its 25-line display offers a maximum of 80 char./line for a total of 2,000 characters.

Centralized Training

The terminals situated in police premises throughout the country are operated by police officers or civilian staff. The training of terminal operators has been undertaken centrally by a group of police officers from various forces, assigned to the Home Office for this purpose.

The PNC's DP center at Hendon includes a Burroughs Corp. B7700 mainframe with three central processors, two I/O processors and four data communications processors. These work as an integral unit that provides protection against the failure of individual units.

Hardware, including processors and core storage, may be added or removed from the system with minimal disturbance, according to a spokesman. The system may be divided or split into two separate parts for maintenance or test purposes.

Fail-Soft Equipment

The configuration is fail-soft. An equipment failure need not stop the system, but may merely degrade the service until the failed component is isolated and removed.

The B7700 processors normally work as an integrated unit, but can work independently if required. The system is capable of enhancement to at least twice its present capacity, the spokesman said.

Storage consists of four memory control modules, each supporting 256K (48-bit) words, giving a total capacity of 1M word over 6M bytes. Each processor is connected to each module and six simultaneous accesses to memory can be made.

The I/O processors are responsible for passing data between core memory and peripherals. Each processor has 28 data-switching channels, enabling it to deal with 28 simultaneous interleaved data transfers.

The data communications processors are small computers in their own right: two are connected to each I/O processor. Their purpose is to control the use of the network and terminals without recourse to the power of the main computer.

Line-Terminating Units

Communications adapters are the basic line-terminating units. There are two types, one for low-speed links and another for medium-speed links.

An adapter cluster can control up to 16 mixed-speed connections and is responsible for multiplexing/demultiplexing the data received from and transmitted to terminals over the links.

Each adapter cluster is connected to two data communications processors at the DP center.

The original PNC net consisted of terminals supplied by Systems Engineering Laboratories, Inc. (SEL). The Delta Data 4050s were added last year, when the network was expanded.

The SEL terminals are used in the south of England, while the Delta Data 4050s are used in the north. There are currently about 150 of the 4050s on the network.

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With Materials Savings to 87%

On-Line COM Speeds SYSOUT Reports

By Thomas E. Ferguson
Special to CW

ROCHESTER, N.Y. — Although computer technology changes rapidly, its uses sometimes change slowly. The use of printouts and computer output microfilm (COM) is a good case in point.

Paper output has been around for nearly as long as computers, while COM is a comparative newcomer to the industry. In the past, the time and effort involved in converting DP-generated reports to microfilm was prohibitive, and various SYSOUT reports — dumps, listings needed for debugging, SYSVLOGS and other output — traditionally were (and still are) printed on paper, even if a department had ready access to COM.

Lately, however, users are finding that on-line COM can provide SYSOUT reports at speeds up to 10 times faster than the average impact printer at a materials savings up to 87%.

For example, an East Coast-based insurance company with an IBM 370/158 dedicated the machine to testing and debugging for its 600 systems and applications programmers. The installation of a laser microfilm printer negated the need for additional impact printers, trimming materials costs by more than 75% and avoiding a capital investment that would have been three times the cost of the COM unit.

In addition, the company found it gained additional savings in increased productivity because of the faster access to printouts. Space savings — microfilm consumes only about 2% of the space taken up by paper — and better integrity for reports retained were bonuses. The laser film printer is producing in excess of 75,000,000 SYSOUT print line/mo.

Element of Success

The key to the success of COM in SYSOUT applications is that adding a laser film printer is quite unlike adding early-technology COM equipment to a computer system. The laser printer may be considered just another system printer and installed on that basis. It differs from conventional paper printers in that it operates up to 10 times faster, uses materials that cost up to 87% less and represents a much smaller investment than that associated with the large number of impact printers it may replace.

Although it can be operated off-line, when on-line, the laser printer appears to a computer system as any other printer. Software needed to operate the COM unit is resident in a built-in minicomputer.

The laser printer is transparent to programming and virtually transparent to computer operations. It operates unattended for up to 13 hours, at which point a new self-threading microfilm magazine can be inserted faster and easier than paper can be changed in an impact printer.

A helium-neon laser writes on the microfilm at 10,000 line/min, and the exposed microfiche or microfilm roll is processed by an integral nonchemical dry-heat technique.

These features all make the unit an attractive output alternative for SYSOUT reports, providing a means for reducing the highly visible paper costs associated with internal DP reports, as well as the more subtle cost of file space and search time.

SYSOUT reports can be generated for four major DP functions that occur in every DP operation: operations; facilities management; systems programming and support; and applications programming.

Computer logs are good candidates for conversion to COM, since they are often stored for as much as a year. Within Eastman Kodak Co. alone this year, approximately 2.5 million pages of these logs will be generated by a 370/158 and two 370/168s.

Although physical storage for this output is a problem, the problem of maintaining the integrity represents a more significant problem, since a missing page can destroy an audit trail that might be needed later. Obviously, this possibility is eliminated with the use of COM.

Another operations report Kodak has converted to microfilm is the CPU scheduling report, which is generated daily and has a short turnaround time and rapid-access requirements. Having this report on film has made operations more efficient, since each user need not go to a central location to find out what the next sequence of jobs sched-

(Continued on Page 42)

Move to Multiprocessors Seen Continuing, Accelerating

By Howard A. Karten
CW Staff

PITTSBURGH, Pa. — The trend toward multiprocessor systems will not only continue but will accelerate since such systems are highly reliable and easily available, according to Daniel P. Siewiorek, associate professor of electrical engineering and computer science at Carnegie-Mellon University.

This information was excerpted from System Reliability and Integrity, *a 1978 Computer State-of-the-Art Report compiled by Infotech International Ltd. of Berkshire, England, and distributed by Auerbach Publishers, Inc.*

In a paper titled "Multiprocessors: Reliability Modeling and Graceful Degradation," Siewiorek stated that the multiplicity of resources such as processors, memories and buses that characterizes such systems can be used to economically create fault-tolerant systems that will degrade gracefully, instead of "crashing" with possible catastrophic results. Such graceful degradation is necessary because "computers are being applied in more situations where a computer malfunction could have catastrophic results . . . [such as] the space shuttle, airlines, hospital patient monitors and power system control," Siewiorek believes.

The problem is compounded, he continued, because the more widespread use of computers means that users are less knowledgeable. This also means there is a greater possibility of inadvertent user abuse.

Several factors have contributed to the attractiveness of multiprocessor systems, according to Siewiorek. LSI technology has provided the low-cost, high-complexity system building blocks that have encouraged a modular design of systems using standard, "off-the-shelf" technology. In addition, this technology makes system expansion easy.

Further, the paper stated, since all resources are duplicated, a system failure involving a critical or unique resource is less likely. In addition, of course, critical or expensive resources can be shared, it noted.

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Users Warned to Proceed Slowly With DDP

Special to CW

NEW ORLEANS — When designing and implementing a distributed DP (DDP) system, "Set your first sights low; make sure the plan is solid and cut and fit the prototype until the user is happy. Then, and only then, install the other systems," Asa Whitehead, director of programming for Southern Railway System, told International Data Corp.'s recent conference on DDP here.

Southern Railway is currently installing 82 systems in railway yards, after changing its ideas several times about the type of processor it needed and the scope of jobs the distributed systems should perform.

In 1973, Southern originated what it called the Terminal Information Processing System (Tips). "We didn't recognize it at birth. It was sort of an ugly child but later we realized we had distributed DP," Whitehead remarked.

It started as an automatic switching system and later became an inventory reporting system.

Southern began with a Data General Corp. 20K-byte machine with a 2.5M-byte disk, but the programs were specific to the machine and in assembly language, therefore not maintainable by the central DP staff. Other peripherals were needed, and the system was not expandable.

Enter the DG 840 with a 10M-byte disk that was operative switching cars in mid-1975.

But then, Southern decided to expedite the processing of way bills. It removed this task from the central site batch environment and instead placed data entry at each source of entry. In this way, reports about where the information was needed could be made in a more timely manner to the distributed mini.

The next upgrade in software and hardware involved the installation of a Nova 3 with 40M-bytes of disk. Since the system came with Cobol, the central DP staff's Cobol programmers could keep busy.By late 1976, the way bill application was completed.

The central computer and the mini in the yard interact in a variety of ways to give each system the data it needs. During the sytsem's evolution, Southern discovered it could get several byproducts from the data handling that were "gravy" and have proved to be good cost-savers.

One such item is demurrage, or billing for the use of cars. This information is now up-to-date, and customers can be billed accordingly.

In addition, the number of cars misassigned to trains has been cut dramatically. In the past, if Southern mistakenly sent a freight car with perishable goods to the wrong designation, it usually had to buy the car's contents.

By mid-1977, the system was built around a 192K-byte DG S/130 Eclipse with 20M bytes of disk, Whitehead said.

The systems at two prototype yards paid for themselves in terms of labor savings, he noted, adding the reduction in personnel occurred through attrition.

Environmental Enemy

Whitehead cautioned users to pay special attention to factors affecting an installation's environment, for instance. Not only can railroad yards be hot, for example, but the dust from railway beds can be deadly to disks.

To conquer some of these problems, Southern's systems sit in cast iron, air-conditioned "caskets." Printers in various parts of the yards that show yard crews where to move cars are encased in specially designed environments, people-proof shacks that look like "one seaters."

One should plan for future demands, Whitehead also warned. "You can be sure users will want to grow devices like mushrooms if they're allowed," he commented.

Maintenance, especially when systems are so remotely located, can be a real problem. "Beware the field engineer" and make sure to negotiate for spare parts on site, he said.

In addition, the user should "examine a fallback position and make sure your rear flap is down," he said, even if this means a manual system.

Southern does not have software maintenance on site but sends out software engineers periodically. It plans to do this via down-line loading in the future...

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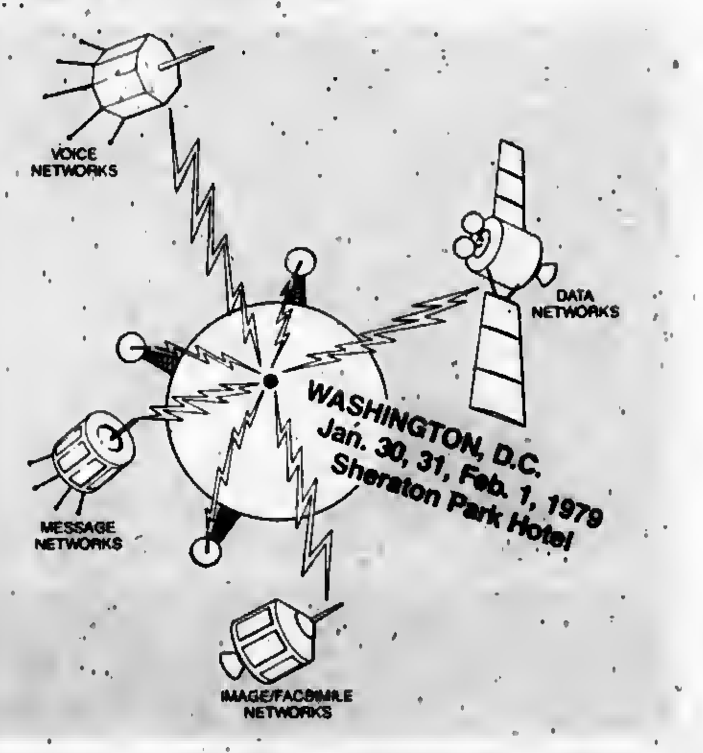

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SYSOUT Reports Good Candidates for COM

(Continued from Page 39)

uled for the system will be.

Having a number of microfiche readers in the computer room and other locations means that users can look up the information rapidly, without leaving their workstations.

Duplicating Material

Another consideration in the use of COM is duplicating: it is not uncommon to find that five copies of a particular production report are needed. Although impact printers can generate multiple copies, high-speed, nonimpact printers must print a report in its entirety every time an additional copy is needed.

However, microfilm duplicators, working off-line, can produce copies at rates up to 900 unit/hour. They can also automatically collate copies as they are produced.

Obviously, other areas can also be economically converted to COM, such as data base audits, the information in a data base and so on. In these cases, microfilm can provide security as well as save space and materials.

Applications programming is another area that generates an extremely high volume of essential listings and reports. Although programmers and systems analysts typically want paper reports on which to write, studies have shown that this habit can be replaced by the use of a scratch pad for program changes, which can then be turned over to keypunchers, suitably marked.

Kodak has found that its programmers have become more productive after making the switch, largely because of the time savings in the operation.

Listings of directories, Volume Table of Contents, catalogs and so forth can also be converted to microfilm. Some of these reports have a long life and many are updated daily. They all have a direct effect on the productivity of the programming staff. Kodak has put these reports on microfiche, and they are duplicated and distributed to seven central locations. Not every programmer or analyst needs a complete copy of each report, and the move has provided better access to these reports.

For its own use, Kodak has calculated a "break-even" point for conventional COM vs. paper, taking into account the obvious costs such as microfilm, computer time, chemicals, labor and amortization of the COM unit. It found that any program, test, or list longer than 1,125 lines — about 23 pages — is more cost-effective when output is on microfilm instead of paper.

As the great majority of reports in any DP department will be much longer than 23 pages, this break-even point effectively justifies the conversion of all SYSOUT-type reports to microfilm.

The calculations did not include the additional savings possible when an on-line unit such as Komstar equipment is used instead of conventional COM equipment.

Many DP departments are finding it is possible for them to cost-justify a laser film printer solely on the basis of their savings on SYSOUT reports. Because they are buying, in effect, a high-speed printer rather than a "microfilm department," they are able to do so without going to the higher levels of management for approval that is often necessary with conventional COM.

Since Kodak has attempted to use microfilm output in every case in which it will do the best job, it has found it could convert 75% of its output to microfilm. Yet the cost relationships are the converse: The remaining 25% paper output accounts for 75% of the materials costs.

In summary, while on-line printout of production reports on microfilm is an important consideration, DP departments can use microfilm to save a significant portion of that 17% to 25% of their paper output that is SYSOUT. A direct dollar savings is possible through space, material and labor savings. Improved turnaround time, accessibility and file integrity are other benefits.

Ferguson is a marketing specialist in computer information systems at the Business Systems Markets Division of Eastman Kodak Co. in Rochester, N.Y.

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To Return West in '79

Mini/Micro Ends Road Trip in Houston

By Jeffry Beeler
CW Staff

Photo by J. Beeler

Some 80 exhibitors and an estimated 6,000 visitors assembled in Houston recently for this year's second Mini/Micro Conference and Exposition.

HOUSTON — Road-tested and only slightly worse for the wear, the Mini/Micro Conference and Exposition capped its first venture outside its California home base when the show pulled into town here recently for a three-day layover in sprawling Astro Hall.

The visit, which formed the second and final leg of a road trip that began last April in Philadelphia, culminated an experiment designed to test the show's drawing power in areas of the country other than its West Coast backyard.

Next year, Mini/Micro will return briefly to the security of its native Anaheim, Calif., before hitting the road again in 1980 for a relatively short trip north to San Francisco.

Reflecting on this year's experience here and in Philadelphia, show floor director Bob Rankin admitted some disappointments but defended the decision to take the event on tour outside the large West Coast computet market that has traditionally formed Mini/-Micro's main base of support. "It's true we drew only 4,500 visitors in Philadelphia, and that was less than we had hoped for, but at the second show we expected attendance to jump to 6,000 and the number of exhibitors to total 80."

But even if registrations here proved less than expected, Rankin would still hesitate to dismiss the show as a failure. "A lot of people who come to Mini/Micro expect to see mobs and are disappointed when they don't find them," he explained. "But you have to keep in mind that this isn't the National

(Continued on Page 44)

Session Speakers Counsel Mini Users

• *Net Upkeep Outlined At IDC's DDP Show*

By Molly Upton
Special to CW

NEW ORLEANS — After a user has bought a raft of minicomputer-based systems and placed them in a nationwide network, how can he make sure the vendor will fulfill his network maintenance requirements?

Fireman's Fund Insurance Co. constructed an incentive plan that ties the amount of maintenance fees to the monthly level of performance sustained by the network, according to Ben Bevis, Fireman's assistant vice-president for distributed systems.

When Fireman's was procuring 60 systems for data entry and local processing in offices across the country, maintenance was a key criterion in vendor selection, he told attendees at an International Data Corp. (IDC) conference on distributed data processing (DDP) here recently.

Bevis felt a "best efforts" assurance was inadequate; because vendors told him their systems didn't fail, he felt they should stand behind these statements. Not only is uptime critical, but the costs of maintenance are not inconsequential, he noted.

As a rule of thumb, maintenance charges run about 1% of the purchase price, which in Fireman's case was about $6 million for 60 Computer Automation, Inc. Syfa Systems. CA was selected after a rigorous selection process that included six vendors running benchmarks at Fireman's for about three months; he said.

To evaluate the vendor's maintenance performance, Fireman's devised an efficiency index both for individual systems and the network. The index defines performance in terms of instances and duration of downtime. Performance is calculated by divid-

(Continued on Page 46)

CA Cuts LSI 4/10 Prices

HOUSTON — Computer Automation, Inc.'s Naked Mini Division has cut the prices of its largest LSI 4/10 minicomputer/memory combinations by up to 42% and the prices of its high-end Alpha 4/10 packages by as much as 45%, company spokesmen announced at the recent Mini/Micro Conference Exposition.

At the same time, the firm announced plans to sell its LSI 4/10 CPUs with half-card, 16K-word and 32K-word random-access memories (RAM) equipped with battery backup.

With the price cuts, which will take effect in February, a 4/10 CPU that now sells for $2,125 (including battery backup and a 16K-word RAM) will cost $1,365.

Meanwhile, the price of a packaged Alpha 4/10 with a 32K-word RAM, power supply, clock, five-card chassis and operator console will drop from $4,690 to $2,560.

CA credited the price cuts for the LSI 4/10 mini/memory combinations to the availability of higher density memory boards and the price reductions for the packaged Alpha configurations to the use of the 16K-word half-card RAMs. Before the company packaged its 4/10 CPU with half-card memories, it used full-card memories.

Despite the price cuts for the 16K-word and 32K-word 4/10 CPUs and systems, the prices of entry-level 4/10 products will remain unchanged. A 1K-word and 4K-word 4/10 CPU will still cost $520 and $645, respectively, while a minimum Alpha 4/10 configuration with processor board, power supply and chassis will continue to sell for $995.

CA's Naked Mini Division is located at 2181 Dupont Drive, Irvine, Calif. 92713.

• *Go On-Line Slowly, Mini/Micro Talk Says*

By Jeffry Beeler
CW Staff

HOUSTON — Don't believe the oft-tepeated vendor claim that you can automate all your applications in one day, Basic/Four Corp. systems manager Cheryl Krumlund urged users and prospective users at the recent Mini/Micro Conference and Exposition here.

Although feasible in theory, one-day implementation usually proves difficult if not impossible to accomplish in practice. The problem lies not in preparing systems for their users, but in getting users ready for their systems, Krumlund explained.

"One of the most common mistakes users make is to underestimate the need for preparing their data for computerization," the systems manager noted during a conference session entitled "Keys to Success in Selecting and Installing a Minicomputer for Business." As a result, applications that under ideal circumstances would require only one day to automate frequently take much longer to prepare.

Because the human element of computing poses such an obstacle to speedy installations, Krumlund advised users to implement their applications gradually. "Never try to place more than two jobs on-line at the same time — and preferably only one," she admonished her listeners.

Which applications a user should implement first depends on the company's job priorities, she added. If a user installs a system primarily to control its inventory, then inventory control should probably go on-line before any other application. "But if you have no critical needs to meet, start with an easy job like payroll or accounts payable," she told users.

(Continued on Page 46)

'S' Version of HP 9825 Addresses 24K Bytes

PALO ALTO, Calif. — Features that are optional with the Hewlett-Packard Co. 9825A desktop computer are now standard with a less expensive, memory-enhanced version of that product — the 9825S, according to an HP spokesman.

Compared with the HP9825A, which provides a minimum main memory of 8K bytes, standard 9825S reportedly stores 24K bytes. In addition, the S version incorporates a strings/advanced programming read-only memory (ROM) plus an HP 9872 plotter/general/extended I/O ROM.

These two features are said to be standard with the 9825S, whereas with the 9825A they are available only as extra-cost options.

When acquired together as part of an S version package, the two ROMs and an HP 9825 desktop computer cost 10.5% less than they would if bought separately, the spokesman explained.

In other product news, HP announced a 50% price cut for the 9825A's ordered, field-installed memory plus price cuts of up to 40% for some of the desktop computer's ROMs. With the reductions, a 9825A field-installed memory sells for 10 cent/byte, while the strings/advanced programming ROM and the 9872 plotter/extender I/O ROM now cost 29% and 25% less, respectively, than before.

No Compiling

Elaborating on the 9825S' features, the spokesman credited the desktop computer with eliminating software loading and compiling. Moreover, editing functions are implemented in software, and an audible alarm warns of syntactical programming errors, the source said.

The strings ROM allows users to manipulate large amounts of data by adding statements to the 9825S' resident language, while the advanced programming ROM provides language enhancements that allow users to increase the sophistication of their programming techniques, the spokesman ex-

(Continued on Page 46)

Mini/Micro Ends Tour in Texas

(Continued from Page 43)

Computer Conference."

Among the event's strongest attributes, he said, was its conference program. With 30 sessions covering seven main topics, the program here was said to have been perhaps the strongest in Mini/Micro's four-year history.

Few Oases

The exhibit floor, however, was another story. Because of Mini/Micro's largely regional appeal, many vendors used the occasion less as a vehicle for launching new wares than as an excuse for rehashing old ones. In fact, as a setting for formal product announcements, the show proved a kind of DPer's desert — an impression heightened by the transplanted cacti adorning Texas Instruments, Inc.'s extensive exhibit.

Even the harshest deserts have oases, however and the Mini/Micro exhibit area was no exception. One of these new product "oases" — Information Processing, Inc. (IPI) — announced its entry into the microcomputer software field with the disclosure that its Blis/Cobol operating system can now support the Data General Corp. Micronova.

With the introduction of the ANS 74 Cobol-based product, Micronovas for the first time can concurrently perform functions like data entry, applications development, transaction processing and inquiry response for multiple users, according to IPI sources. Competitive Micronova operating systems, by contrast, can provide only single-user environments, they added.

Capable of supporting DG's 10M-byte disk units, the multiuser operating system reportedly allows Micronova users to expand upward through the Nova and Eclipse series systems without having to recompile their programs.

As a virtual memory operating system, the IPI product also provides features like dynamically updated indexed files with up to three alternate keys, spooling, screen management through Cobol, on-line debugging, Cobol programs as large as 200k bytes and system utilities.

Priced at $4,000, the Micronova version of Blis/Cobol is available from IPI at Suite 320, 1850 Lee Road, Winter Park, Fla. 32789.

Remex Debuts

Remex, meanwhile, used the show as an occasion to announce two products — its Data Warehouse storage system and the RFD 4000/4001, a dual-head floppy disk product that emulates its Shugart Associates and IBM counterparts.

Consisting of a sealed, Winchester disk system from California Computer Products, Inc. and two Remex floppy disk units, the Data Warehouse reportedly provides 17M bytes of fixed storage and 730K to 2.5M bytes of removable storage. Remex credits the product with transferring 960K byte/sec from the fixed medium up to 62.5K byte/sec from the removable media.

The Data Warehouse costs $6,700 in OEM quantitites.

The RFD 4000/4001, by contrast, comes in single- or double-density configurations with capacities of 800K or 1.6M bytes, respectively, Remex officials said. In addition to being media-compatible with the single-sided IBM 33FD and double-sided IBM 43FD, the dual-head unit is physically and electrically compatible with the Shugart SA850 and SA851R, Remex said.

Among its other features, the product rotates at 360 rev/min, provides an 83 msec latency, settles in 15 msec and accesses in an average of 91 msec with 3 msec track-to-track access, Remex spokesmen added.

Like the Data Warehouse, the $740 RFD 4000/4001 will become available during the first quarter 1979 from Remex at 1733 E. Alton St., Box C19533, Irvine, Calif. 92713.

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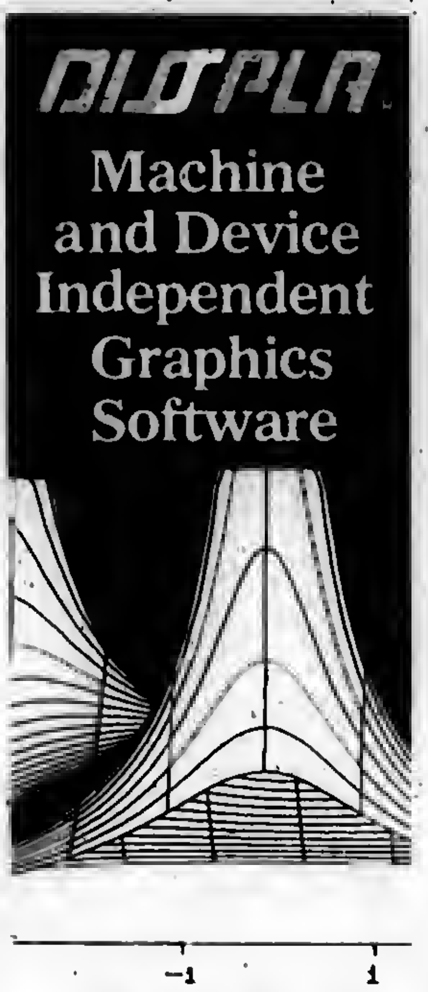

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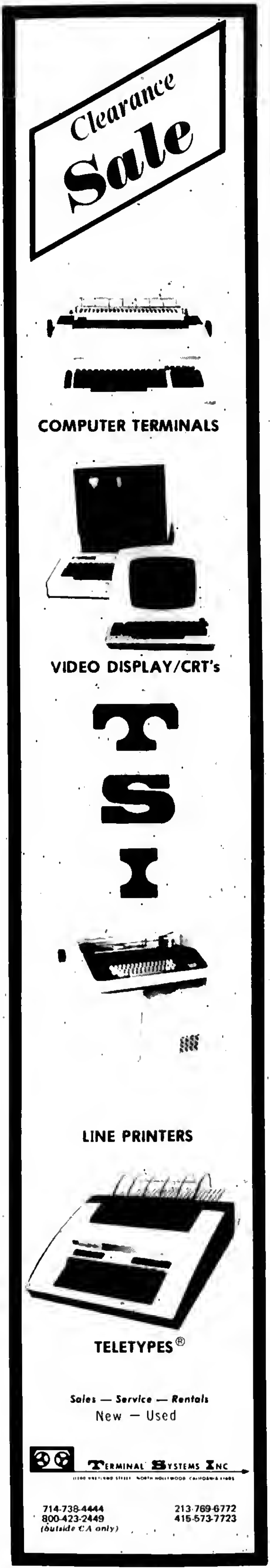

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HP 9825S Has More Memory

(Continued from Page 44)

plained.

Like the advanced programming ROM, the three I/O ROM versions also provide programming language enhancements that let users address peripherals and external devices through five I/O cards. Each additional ROM reportedly contains 8K bytes of nonuser-addressable memory.

Minimum Configuration

Although the 9825S typically supports a maximum main memory of 24K bytes, the desktop computer can expand to 32K bytes "in special cases," the spokesman said. That increase, however, robs memory space usually allocated to ROM.

A minimum 9825S incorporates a 9825A desktop computer with 8K bytes of main memory expandable in 8K-byte increments. In addition, the computer concurrently supports up to four 500K-byte flexible disk units, a built-in 16 char.-wide strip printer that outputs 32 char./sec and up to 14 additional printers.

The 9825S also supports an integral CRT unit plus an optional second terminal. But as a basically stand-alone unit, the computer loses its interactive capability with the second terminal, the spokesman cautioned.

Optional peripherals available with the 9825S include a 30 char./sec impact printer, a 200 line/min line printer and a 240 line/min thermal printer.

Although the machine does not compete directly with any other unit, it does belong in roughly the same product class as Digital Equipment Corp.'s PDP-11/03-based Minc system, a packaged configuration for laboratory applications, the source said.

Like the 9825A, the S version reportedly suits engineering, mathematics and statistical applications as well as instrument control functions.

Designed for operation by non-DP personnel, the 9825S attaches to instruments and peripherals through 16-bit parallel, bit serial or BCD interfaces or through the HP interface bus.

The package costs $7,700 and is available from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Network Upkeep Paid on Point System

(Continued from Page 43)

ing the number of points the vendor earned by the total number of available points, which is the number of systems multiplied by 50. A system earns 50 points for perfect performance during a month.

Amber, Yellow and Red

There are three different statuses, each with different point penalities, Bevis explained. Amber status is when a system is degraded for nine consecutive hours or inoperable for more than 30 minutes. Each amber status costs five points.

A yellow status occurs when a system is degraded for 18 consecutive hours or inoperable for four consecutive hours; it costs 25 points. A red condition, which happens when a system is degraded for 36 consecutive hours or inoperable for 18 consecutive hours, costs 50 points.

The scheme is calculated on a network-wide basis, and the network maintenance charges consist of the efficiency index multiplied by the maximum monthly maintenance charge. However, if the efficiency index is .90, Fireman's pays 100% of the maintenance charge; if the index is .45, it pays nothing.

A .90 rating allows every system to have two Amber conditions in a month, Bevis pointed out.

The clock starts running when Bevis calls the vendor. Fireman's has instituted its own network service center to act as the focal tracking point.

Bevis has found that many of the trouble calls pertain to users' ignorance about the vagaries of applications programs. He has therefore added an applications specialist to handle hot-line calls.

During the selection procedure, Fireman's subjectively evaluated each vendor's maintenance responsiveness and ease of development in addition to performing benchmarks tests.

Some of the considerations Bevis focused on were whether the vendor performed his own maintenance, who does the maintenance report, the type of downtime reporting system maintained by the vendor and whether the gear had dial-up diagnostic and downstream loading capabilities.

Fireman's required the vendor to do his own maintenance and was leery of firms whose maintenance functions were profit centers in their own right. Bevis felt these vendors would be less likely to make calls than if they reported to their marketing departments.

During the benchmarking, Fireman's found a high level of competition among vendors, with prices declining, performance increasing, software development accelerating and delivery schedules improving, Bevis said. The finalists included IBM, Four-Phase Systems, Inc., Digital Equipment Corp., Computer Automation, Microdata Corp., and Datapoint Corp.

Four Fireman's programmers attended each vendor's classes for a week and then wrote a data entry and query program which was run on the machines

Stopwatch Verdict

Vendors, armed with stopwatches, followed Bevis as he timed machines with his set of stop watches. When they were dissatisfied with their results, they altered their system software and then tried again, he said.

Some of the tasks timed included data entry — measuring two aspects: the number of 50-character data records entered by six terminals in one minute and then with the benchmark load, including two terminals performing disk lookup, a printer and communications.

Other tasks included disk file lookup, both with and without the benchmark load, and various aspects of a system under the benchmark load, including data entry, disk file lookup and print spooler.

In addition to the stopwatch verdict, there was subjective evaluation of relative vendor responsiveness and ease of development.

Slow Move On-Line Urged

(Continued from Page 43)

Speaking on the subject of minicomputer hardware implementation, Krumlund also advised users to question the familiar vendor claim that they can continue to rely on their old processing methods until they are sure their newly installed system can perform its intended functions.

Old Approach Not Possible

"The old notion of operating parallel systems is just not possible for most applications," she asserted. "Most people who install a minicomputer were already overburdened with their previous system, so it's not likely that they will be able to manage the extra load of a new computer system."

In other advice, Krumlund urged users to place responsibility for managing a new system in the hands of one individual. Without some form of central control over system operations and procedures, each user will set his own job priorities and anarchy will quickly ensue, she warned.

Once appointed, the systems manager in turn must appoint a systems operator or team of operators and institute the appropriate training programs.

Software houses provide one source of operator training, and other sources are also available. But wherever they train their personnel, managers must make sure they have two qualified individuals to perform each computer job.

Without some form of personnel backup system, minicomputer users could soon get into trouble.

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Micros Help Score New York Marathon

NEW YORK — As close to 10,000 runners crossed the starting line of last month's New York City Marathon, more than 40 volunteers and an array of computer equipment — including two microcomputers — prepared to time and score the runners at the finish line in Central Park. The 26.2-mile race through the five boroughs of New York was billed as the largest such race anywhere, and the 8,588 runners who crossed the line over a five-hour period were the greatest number ever scored by an automated system.

Included in the system were three Computer Identics Corp. bar code scanners, two Intel Corp. 8080 microcomputer systems and a Data General Corp. Eclipse C/330 minicomputer. The scanners and the Intel systems were located in a van at the finish line, while the minicomputer was in a midtown Manhattan office.

The system consisted of two phases: The first was the data capture system provided by New York Telephone Co., a corporate sponsor of the marathon, on the Intel micro system. Push-buttons at the finish line were wired directly to the micro; whenever a runner crossed the finish line, a button was pushed and an interrupt was generated within the computer.

This caused a time to be registered along with a lane identifier. Three adjacent but logically separate finishing lanes were used because of the volume and density of the finishers.

After crossing a finish line, runners were directed to one of three holding chutes, where bar-coded tags attached to each runner's number were torn off and placed in order on a wire spindle. The spindles were numbered consecutively as new holding chutes were opened (only one of the three chutes per finishing line was open at any moment).

When chutes were closed (after 60 to 100 runners), the completed batch of tags was brought to a nearby van. There the tags were scanned with the bar code scanners, which were wired to the micro system.

In order to keep all three scanners continuously busy, batches of tags could be scanned out of order since the micro could reorder them using the sequential batch identifiers. Unscannable or missing bar-coded tags were hand-entered via the scanners' keyboards.

Once the data was input into the micro, runner numbers and times were combined for each of the three finishing lanes. The lanes were then merged into a stream of data which was sent to the minicomputer over a 1,200 bit/sec phone line and a simple packet protocol set up for the application.

Scoring Phase

Tho second phase of the system was the scoring facilities provided by Personnelmetrics, Inc., a small consulting firm here that was responsible for the computer scoring of the 1977 New York City Marathon and the 1978 L'Eggs Mini Marathon. The scoring was handled on the minicomputer running under DG's Advanced Operating System.

One program read the data coming from the micro and stored it on disk and magnetic tape (the tape was used as backup). A second program read the time and runner number data stored on disk and looked up the runner's name, sex, age, country and team in a direct-access data base that had been developed over the preceding three months.

This data was written to a finishing list which was printed on a 1,200 bil/sec Digital Equipment Corp. Decwriter back in the van in Central Park. This second program also

(Continued on Page 48)

E-H Builds Portable System For Eprom Programming

OAKLAND, Calif. — Described as a self-contained, portable system that eases the programming of erasable programmable read-only memory (Eprom), the Model 4 from E-H International, Inc. can be used to program different Eproms from keyboard commands.

The system contains all the pin drivers to program, emulate, verify and alter all Eproms with 4K to 128K memory. The Model 4 can emulate incircuit devices to aid troubleshooting, communicate directly with a development system through a serial data interface and upgrade Eproms in program capacity by use of the 2K by 8-bit random, access-buffer memory and move routines.

A serial I/O port enables the Model 4 to communicate directly with a development system, terminal or teletypewriter, E-H said. It can also perform check-sum verification and execute move and list commands; it has fully buffered and cold sockets, a spokesman noted.

A companion system, the Model 16B production programmer, was designed to repeat a program into 16 memories at once for fast Eprom duplicating, the firm said. The Model 16B features replaceable plug-in mother sockets and bypass lights to show program status at each socket, according to the spokesman.

The system automatically blank-checks programs and verifies all Eproms when started, he added.

Both models program triple-supply 2704, 2708 and 2716 Eproms and single-supply 2508/2758, 2516/2716 and 2532 Eproms as well as 2732, 2564 and 2764 Eproms. The Model costs $2,495 and the Model 16B costs $4,995 from E-H International, 515 Eleventh St., Oakland, Calif. 94607.

Sort/Merge Designed for 6800

W. LAFAYETTE, Ind. — Users of 6800 microprocessors can now take advantage of a full-disk sort/merge package that was designed for high speed and convenient operator interface, according to its vendor, Technical Systems Consultants, Inc. (TSC).

Written in 6800 Assembly language, the package is compatible with the standard 8-in. Flex disk operating system found on Southwest Technical Products Corp.'s DMAF-1 floppy disk system. Any type and size file may be sorted, TSC noted.

Features include any size of fixed- or variable-length input records, fixed or variable length fields, user-definable record and field terminators and up to 20 input or output keys.

Included in the price of $75 for the sort/-merge package (AP68-10) is a user's manual and 8-in. Flex disk containing the object code. The manual may be purchased for $15.

A catalog of microcomputer software products mainly for the 6800 and 8080 microprocessor is available for 25 cents from TSC, Box 2574, W. Lafayette, Ind. 47906.

Systems With 8-Bit Ports Get Analog Input Module

BROOKFIELD, CONN. — Connecticut Microcomputer has introduced the AIM16, an analog input module for its data acquisition modules systems.

The Aim16 has 16 8-bit analog inputs which are individually addressed; conversion time is 100 microsec. The AIM16 can be used with any system that has an 8-bit output port and an 8-bit input port.

The AIM16 costs $159. A starter kit with the AIM16, power supply and input and output connectors is priced at $189 from Connecticut Microcomputer, 150 Pocono Road, Brookfield, Conn. 06804.

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Probe From Intel Extends Troubleshooting to 8085

SANTA CLARA, Calif. — Intel Corp. has introduced a probe subsystem that reportedly broadens the applications range of the Uscope 820 microprocessor system console. With the Probe 8085, the Uscope can be used to troubleshoot systems based on 8085 and 8085A as well as 8080A microprocessors, the firm said.

The Probe 8085 connects the Uscope 820 console to the system under test via the microprocessor socket. This allows the microprocessor actually used in the system under test to continue to operate during testing so total system operations can be diagnosed, a spokesman noted.

Used in combination with the Uscope 820 console, the Probe 8085 allows a user to simplify fault isolation by executing automatic diagnostic programs on the 8085 system; enter a detailed troubleshooting mode via the Uscope 820 console's 32-bit-wide break point, 128-byte overlay random-access memory (RAM) and 256-level machine cycle trace memory; and examine the actual flow of an 8085 program.

The Uscope 802 console and Probe 8085 can be purchased as a kit for $2,795.

The Probe 8085 alone costs $825 from Intel, 3065 Bowers Ave., Santa Clara, Calif. 95051.

'Z,' Xitan Users Organized

SAN ANTONIO, Texas — Two users groups have been formed recently, the Z Users Group and the Xitan Users Group.

The Z Users Group was formed to exchange information between Z8, Z80, Z8000, Mostek 3880 and other microprocessor users in the same family.

The group plans to publish a newsletter with information on systems and applications software, interfacing problems and solutions, evaluations, extensions and modifications to products.

The Xitan Users Group will also publish a newsletter with information relevant to Xitan, Inc. products on such things as modifications, extensions and evaluations of Xitan products, difficulties encountered, clarification of documentation and products to be bought, sold or traded.

Dues for both users groups are $5 a year. More information can be obtained from contacting either the Xitan or Z Users Group, 1015 Navarro, San Antonio, Texas 78205.

S-100 Debug Board Allows Stepping Through Program

TALLAHASSEE, Fla. — The Tracer is an S-100 board that provides complete program control by a combination of hardware and firmware, according to its maker, Objective Design, Inc.

With interrupts, the Tracer enables the user to single-step through a program, whether in programmable read-only memory (Prom) or read-only memory (ROM), and contol all ongoing processor actions, a spokesman explained.

The debug software resides in on-board firmware (Proms); customized software to match a user's system is available, the company indicated.

No Restart Vectors

The on-board interrupt hardware does not require use of the restart vectors or the low address space, the firm said. Five unused interrupts are available for system use, with vectors to any address in memory.

The Tracer is available in kit form with two Proms for $244.95 from Objective Design, P.O. Box 20325, Tallahassee, Fla. 32304.

Report Evaluates Micros

PENNSAUKEN, N.J. — More than 65 microcomputer vendors and approximately 600 different products are discussed and evaluated in a report recently released by the Alltech Publishing Co.

"Introduction to Personal Computing" compares and defines the major products and equipment of each vendor and lists the computer stores and catalog houses the material can be found, a spokesman said.

The report also identifies key literature sources and personal computing publications that might aid the user in equipment selection, he said.

The publication contains a full listing of the names, addresses and telephone numbers of each vendor, the spokesman added.

The report costs $25 from the publisher at 212 Cooper Center, Department 2, N.Park Drive and Browning Road, Pennsauken, N.J. 08109.

Two Micros Help Score Marathon

(Continued from Page 47)

notified race officials as runners qualified for any of the more than 125 awards offered by the New York Road Runners Club and other organizations.

With this system, copies of the finishing list were available for runners to check their times and places at the awards ceremony that evening. After final editing of the finishing list (largely deletions of unregistered runners), an official list was prepared.

Automated Typesetting

In addition, a tape of the finishing data was sent to Data Reduction, Inc. of Woodbury, N.Y., for automated typesetting that will be used in the preparation of a results publication.

In addition to the scoring work, Personnelmetrics created and maintained the data base of all entrants. Any deletions, additions or editing were processed on this data base; reports such as listings by running number or name and statistical lists — distributions by country or by state — were also produced from the data base.

Aside from reports, the system produced acceptance letters, registration cards, bus passes and mailing labels.

Tilewick and Anderson are with Personnelmetrics, Inc.

Beginner Pens Book on Basic

HOUSTON — A book for beginners written by a beginner, *"The User's Guide to North Star Basic"* by Robert R. Rogers, is now being published by Interactive Computers.

Rogers, a microbiologist without any prior knowledge of computers or the Basic language, has chronicled his learning experiences from start-up to program completion, according to the company.

Step-By-Step

The book takes a step-by-step approach with discussions and examples covering 36 major topic areas. A number of programs for games, teaching and business are included to demonstrate particular programming techniques.

The 200-page book costs $14.95 and is available from computer stores or from Interactive Computers, 7620 Dashwood, Houston, Texas 77036.

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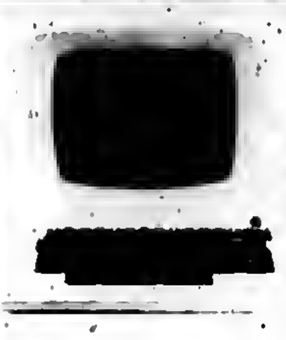

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Hewlett-Packard ends the computer compromise.

The HP 250

The lowest-priced computer with true data base management, the HP 250 was designed to be simple both to program and operate. The keyboard is like an electric typewriter, the numeric pad like an adding machine, and the CRT adjusts vertically and horizontally for comfortable viewing.

Eight soft keys underneath the screen can be programmed to lead the user through each task step-by-step. They'll also help you cut corners in writing applications software, especially when working with the other tools we provide—IMAGE/250 DBM and its inquiry scheme QUERY/250, FORMS/250, and REPORT WRITER/250.

The system can accommodate four terminals and has up to 256K bytes of main memory. You can also get up to three flexible discs, or one flexible plus one fixed disc, built right into the unit. (Total storage can expand to 40 megabytes.) A self-test system and easy maintenance of the CPU and memory boards, all on a roll-out chassis, are two more features of this exceptional computer. Another is the price: it starts at just **$24,500.**

The HP 300

Virtual memory, silicon-on-sapphire (SOS) technology and an Integrated Display System gives the HP 300 big performance in a very compact frame.

It can handle up to 16 users simultaneously, grow to a megabyte of main memory and over 250 megabytes of disc storage, do transaction processing and sort-and-print jobs simultaneously, and control every application from the central console. Its eight programmable soft keys can be captioned on the display to give the user a series of choices in running a job. And the display itself divides into multiple 'windows' for viewing several different parts of an application. They can even be scrolled individually, both vertically and horizontally, to a width of 160 columns and several thousand lines in length.

Two widely used languages are available—RPG II and Business BASIC. And our IMAGE data base management, plus an English-like inquiry facility, makes it much easier to write your programs and manage your information. The price? From **$36,500.**

The HP 3000 Series 33

The latest addition to the HP 3000 family, the Series 33 also uses SOS to
lot of power into a simple desk unit. Designed for multiple users at remote term
the system can expand to a megabyte of error-correcting main memory, and grow
megabytes of disc storage. It offers both the operating system (MPE III) and IM
data base management that set the HP 3000 line apart from other interactive comp

The basic system consists of the CPU (now on three chips totaling less th
square inch instead of 700 square inches of PC boards), 20 megabytes of cartri
disc storage, a double-sided flexible disc with one megabyte capacity, and a microp
sor-based console that doubles as a service 'window' on the system, with a plug-
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to configure the system precisely the way you want it.
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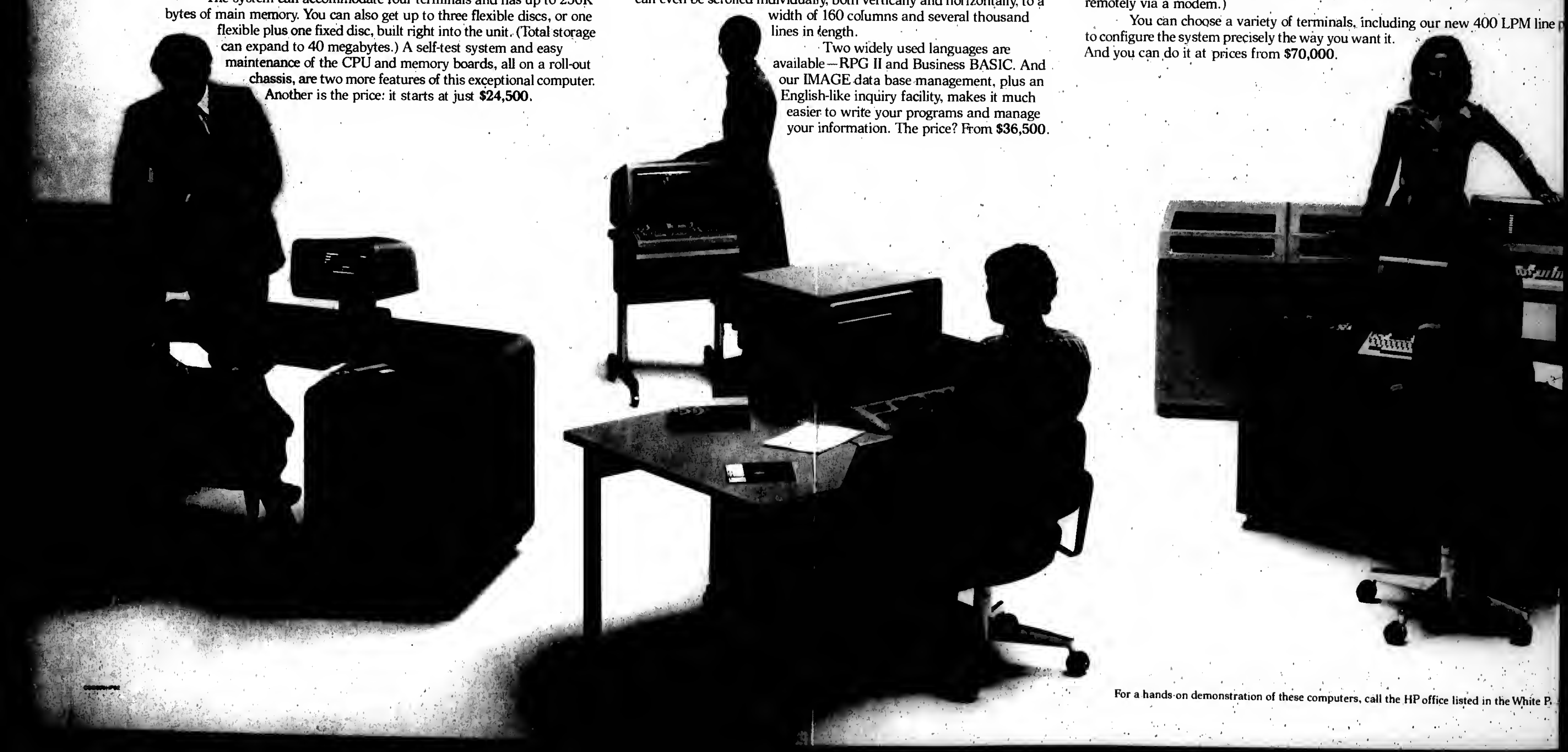

For a hands-on demonstration of these computers, call the HP office listed in the White P n-sapphire (SOS) technology and ives the HP 300 big performance in

sers simultaneously, grow to a over 250 megabytes of disc storage, ort-and-print jobs simultaneously, and he central console. Its eight program- on the display to give the user a series the display itself divides into multiple ifferent parts of an application. They y, both vertically and horizontally, to a 160 columns and several thousand ength.

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The HP 3000 Series 33

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The basic system consists of the CPU (now on three chips totaling less than one square inch instead of 700 square inches of PC boards), 20 megabytes of cartridge disc storage, a double-sided flexible disc with one megabyte capacity, and a microprocessor-based console that doubles as a service 'window' on the system, with a plug-in self-test cartridge that runs a complete check in less than two minutes. (It can even be done remotely via a modem.)

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And you can do it at prices from **$70,000**.

The HP 3000 Series III

The top of the line HP 3000 Series III offers more power than the Series 33, while sharing the same powerful operating system and data base management. It has six high-level languages (COBOL, RPG, APL, FORTRAN, BASIC and SPL), as well as networking and manufacturing software* for inventory control and materials planning. And 16K RAM semiconductor memory is available for the unprecedented price of $32K per megabyte.

Virtual memory and our extremely powerful operating system allow up to 63 users to interact with the Series III at the same time. Other new wrinkles: multi-point terminal capability, remote data base access in a distributed network and transaction logging. Starting price: only **$115,000**.

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Input Peripheral for Range Of Uses Comes in Kit Form

SCOTTSDALE, Ariz. — Talos Systems, Inc. has introduced the Digikitizer, an input peripheral for architectural and mapmaking functions, mathematical analysis, motion picture film generation and medical and dental analysis, the firm noted.

The Digikitizer has an active surface area of 11 in. by 11 in. and a resolution of 200 line/in. The data rate is 100 coordinate pair/sec and is switch-selectable from point to continuous operating modes.

Features include an RS-32 option with selectable transmission rates and a high-resolution Apple Computer, Inc. interface add-on board. Interface boards to the Radio Shack Co. TRS-80 and Imsai Manufacturing Corp. systems will be available soon, the company said.

The Digikitizer costs $449 from Talos Systems, Inc., 7419 E. Helm Drive, Scottsdale, Ariz. 85260.

Zilog Reduces Prices For Systems, Components

CUPERTINO, Calif. — Users of Zilog, Inc. systems can now take advantage of price reductions in selected systems, boards and components.

The MCZ-1/20 tabletop MCZ floppy disk and the MCZ-1/25 rack-mount MCZ floppy disk are available for $6,490 each, a reduction of $850. The MCZ-1/05 tabletop MCZ floppy disk has been reduced from $6,100 to $5,990.

The Z80 RMB/48 price for quantities of one to nine has been reduced from $1,850 to $1,350; the Z80 MDC/48 from $2,095 to $1,495 and the Z80 I/O board from $350 to $295.

The Z80 and Z80A CPUs in the same ceramic packages and temperature range are now available in quantities of 100 or more for $12.85 and $15.45 respectively, less than half their former prices, according to the firm.

In the same package and temperature range, the dual-channel Z80 and Z80A serial I/O circuits, formerly priced at $54 and $68, in lots of 100 or more, have been cut to $35.70 and $39.30 respectively.

More information is available from the Zilog Publications Department, 10340 Bubb Road, Cupertino, Calif. 95014.

Word Generator Fits TM-500

SAN PEDRO, Calif. — A four-channel by 32-bit 30MHz word generator that plugs into Tektronix, Inc. TM-500 series power modules is now available from Pulse Instruments Co.

The Model PI-210 was designed to operate with Pulse Instruments' PI-100A clock generator to provide the industry's only digital word pulse generator, the firm said.

The combination of the two devices is intended for testing high-speed digital circuits and systems.

Additional features of the PI-210 include a variable word length up to 32 bits, 12k-bit maximum word length by cascading and serial or parallel data format.

The PI-210 costs $850 from Pulse Instruments Co., 1536 W. 25th St., San Pedro, Calif. 90732.

Lab Users Get Z80-Based Micro

BURLINGTON, Mass. — Described as a desktop Z80-based microcomputer, the Eastern Analytical Bluebird from Eastern Analytical Laboratories, Inc. was designed for running laboratory routines and mathematical and statistical analyses.

Using self-prompting software written in 14.6K Extended Basic, the instant-on system features a high-resolution monitor, full Ascii keyboard, math pad and 13 user-definable keys. Other features include 32K random-access memory expandable to 64K and dual magnetic tape cassettes, each with 500K bytes of storage.

The Eastern Analytical Bluebird costs $8,700 and the thermal printer $1,550 from Eastern Analytical Laboratories, Inc., 1 "A" St., Burlington, Mass. 01803.

Objective Design Unveils S-100 Card

TALLAHASSEE, Fla. — Objective Design, Inc. is offering the Syscon, an S-100 card designed to complement a user's CPU by providing programmable read-only memory (Prom), 254 bytes of scratchpad random-access memory (RAM), true Call-type interrupts, power-on jump, real-time clock, on-board generation of Mwrite and an 8-bit parallel output port.

With the proper bootstrap program in Prom, Syscon can get a disk-based system going while providing the real-time clock and interrupt characteristics of a high-power computer, according to the company.

The Syscon board without Prom is available in kit form for $207.95 from Objective Design, Inc., P.O. Box 20325, Tallahassee, Fla. 32304.

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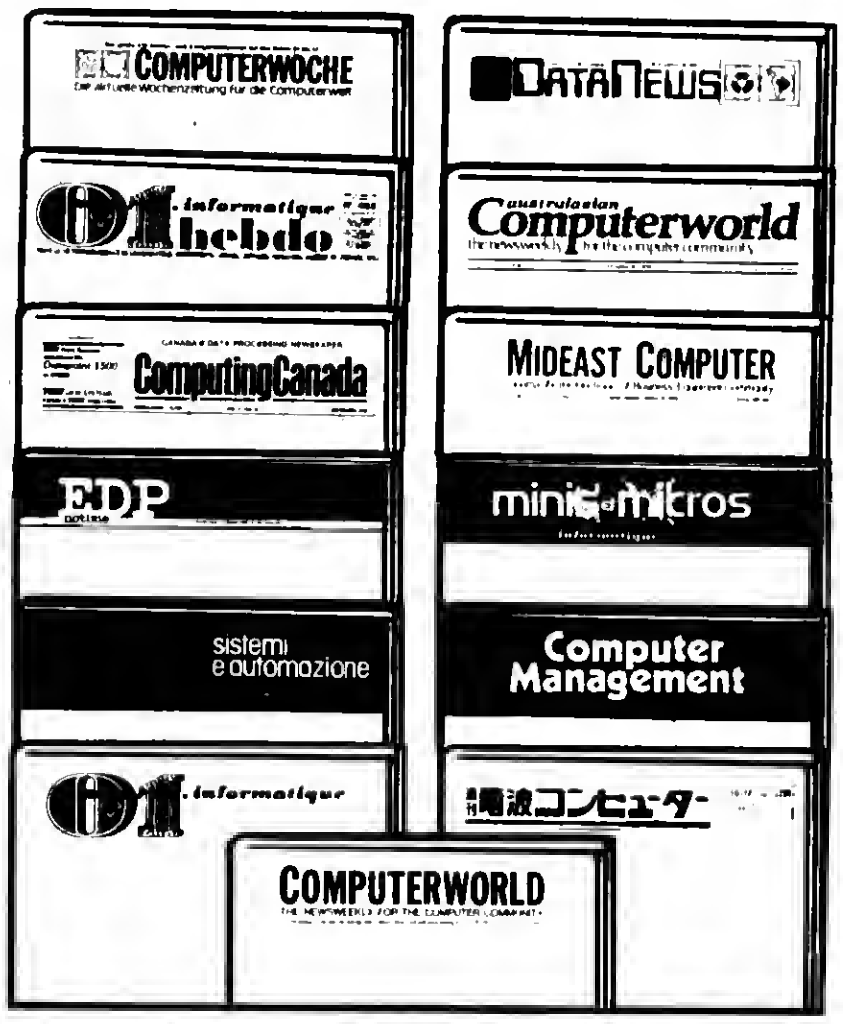

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United States	36,100	45.3%	1
Japan	8,331	10.0	2
W. Germany	6,527	7.9	3
United Kingdom	4,794	5.8	4
France	4,768	5.8	5
Canada	2,301	2.8	7
Italy	2,119	2.6	8
Australasia	2,044	2.5	9
Brazil	532	.8	17
Middle East	328	.4	22

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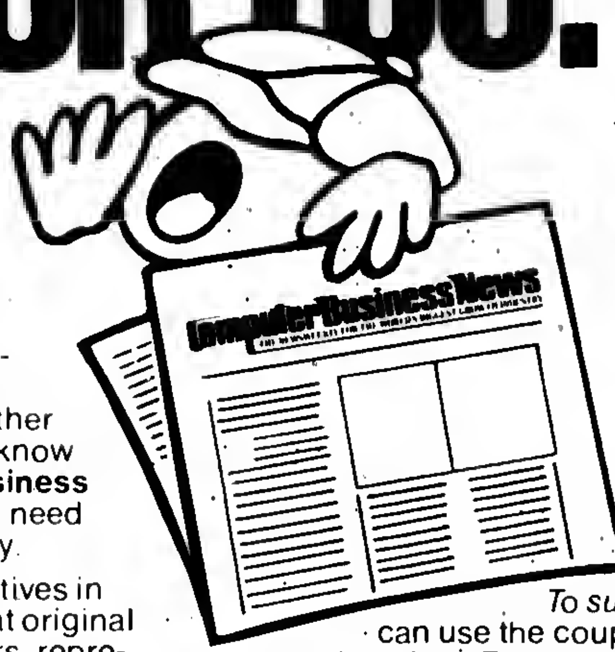

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Computer Business News is edited to serve key executives in management, engineering, production and marketing at original equipment manufacturers, systems houses, distributors, representatives, internal systems groups at sophisticated end user organizations, and other multiple unit buyers of computer products and services. According to International Data Corporation, the world's leading EDP market research firm, this marketplace is over $4 billion now, and should grow rapidly to $9 billion in 1981! So the need for good, up-to-date information is especially important.

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Cost of Capital Not a Factor

Industry Seen Weathering Recession

By Marcia Blumenthal
CW Staff

How will the computer industry fare as the prime rate — expected to rise even higher — clocks in at 10.5% to 11% and a recession, the third of the decade, threatens to hit in mid-1979?

"There is reason for concern but not panic for 1979 and 1980," Frederick Withington of Arthur D. Little, Inc., said succinctly. Withington's comment summarized the generally unpessimistic mood of computer industry observers who were recently interviewed about the effects of high interest rates and a predicted industry recession.

Most analysts agreed that high interest rates will swell the demand for leased equipment. However, if the money supply becomes tight, lessors would be seriously affected.

Lessors generally don't think there will be a shortage of capital as there was during the recession of 1974 and 1975 (see story on Page 60). Users would willingly absorb the increased cost of leasing resulting from the higher interest charges incurred by lessors in financing their lease bases, they maintained.

No Postponement Seen

Users will probably not put off the acquisition of mainframes unless the recession is particularly severe, according to Withington. Users of large-scale systems have long-range plans; even during the 1974-1975 recession, there was only a brief postponement in acquiring large systems, which was quickly made up by a surge in demand, Withington recalled.

However, those users contemplating the acquisition of large and medium-size equipment typically want long-term leases. Vendors, who are in a strong financial position today, want to use their funds for inventory and expansion, rather than to finance leases for their customers at high interest rates.

Consequently, Withington concluded, manufacturers at all levels within the industry will be trying to induce customers to purchase equipment, but customers will want to lease.

"I'm more concerned with the cost of money slowing things down than I am about a drop in demand caused by a recession. But, if the Administration and the Federal Reserve Board stick to their guns and hold to policies they have recently announced, I wouldn't be surprised to see interest rates hit 15%," Withington said.

Although interest rates could hit 15%, the duration rather than the level of these interest rates was the concern of one Wall Street economist.

However, users contemplating purchases or leases of add-on equipment such as memory or disk drives may hold back on expenditures, Withington continued. And, of course, vendors who cater to the small business user will feel the bite of a recession.

Hedge Against Inflation

At Drexel Burnham Lambert, Inc., staff researchers did not think most users contemplating near-term acquisitions of equipment will shelve those plans because computer equipment is viewed as a labor-saving device and hence an inflation hedge.

Most healthy computer firms have sizeable backlogs which will supply about six to 10 months' worth of annual revenue. Moreover, much industry revenue is derived from foreign sales; a repeat of the last recession, which was worldwide, is not expected.

Harry Edelson, vice-president of research for Drexel Burnham Lambert, said that, on the whole, the computer industry is in good shape to withstand a recessionary period.

"The likelihood of sustained high interest rates in 1979 could work to the disadvantage of the computer industry if large numbers of users elect to lease rather than purchase equipment. In that case, earnings would be depressed somewhat because outright sales are more profitable than leases in the short term," he said.

The major shift from leasing to outright purchase in the past three years may be halted, but pricing and investment tax credits will prevent a reversal of that trend, Edelson said.

Cleaner Balance Sheets

Edelson pointed out that computer firms have cleaned up their balance sheets, particulary their debt-to-capitalization ratios. For instance, he remarked, Burroughs Corp.'s debt-to-capitalization ratio slid from 34% in 1972 to 9% in 1977.

(Continued on Page 60)

AM Makes Bid To Acquire Microdata Corp.

LOS ANGELES — Addressograph-Multigraph Corp. (AM) has made a bid to acquire Microdata Corp., offering Microdata shareholders a one-for-one stock exchange.

Donald A. Graham, president and chief operating officer of Microdata, said his company's board of directors is reviewing the proposal: "Addressograph-Multigraph spent some time reviewing us and our board is now considering its offer in some depth." Although Graham would make no further comment on the offer, he said Microdata had not been seeking to be acquired.

On the other hand, AM has been active in acquisitions and has been moving into the computer industry. Since Roy L. Ash became AM chairman about two years ago, his aim has been "to move into new era markets through advanced technology." AM is currently in a strong cash position with $50 million reportedly on hand.

"We're moving the whole company in the direction of electronics for business management, particularly as it relates to information management systems," Ash said.

The acquisition of Microdata would mark AM's entry into the general-purpose computer systems industry sector.

Two Recent Buys

Aside from the proposed Microdata acquisition which at recent market prices would allow AM to acquire Microdata for about $47 million, AM has been involved in two other takeovers. On Oct. 16, the company agreed to purchase for $1.5 million Micro Data Corp., a small, privately owned firm in Dayton, Ohio, which specializes in micrographics for engineers.

To date, AM's largest acquisition is ECRM, Inc., a Bedford, Mass.-based firm specializing in laser-driven printing systems, text editing equipment, optical character recognition equipment and high-resolution facsimile systems for the newspaper industry. That acquisition should be completed later this month, with AM paying $4.50 a share for approximately 1.2 million shares of ECRM.

Microdata ended its last fiscal year with $64.9 million in revenues, a robust increase from 1977's revenues of $37.7 million. Earnings for 1978 totaled about $4 million or $1.81 a share compared with 1977 earnings of $1.9 million or 86 cents a share.

Small Lessors Exempted From At-Risk Tax Ruling

By Marcy Rosenberg
CW Staff

CHICAGO — The Computer Dealers Association (CDA), which had voiced objections to the Steiger-Hansen tax bill's proposal to apply the at-risk rule to small companies, gained some ground in the version of the bill that was passed recently.

The CDA also rallied, though unsuccessfully, to have the investment tax credit limitation raised to 90% in 1979 instead of 1982, as proposed.

Although the 1982 effective starting date prevailed, the CDA did win an at-risk rule exemption for equipment leasing activities of small companies under certain conditions.

Under the at-risk rule, an operating loss on a transaction is not deductible except when actual money is at risk, CDA legal counsel Joe Manello explained.

"What we objected to," according to Chris Ragland, CDA chairman of the Federal Government Liaison Committee, "was the proposed amendment which stated the at-risk rule would apply to any closely held corporation in which five or fewer individuals own more than 50% of the stock."

By this definition, "the rule would apply to 60% to 70% of our members and create disastrous accounting problems for us," he said.

This rule would have affected computer dealers because "they commonly borrow money from financial institutions to pay for the equipment they buy (and subsequently lease) and give these institutions a nonrecourse note exempting the dealer from personal liability," Manello said.

"Because they would have no money at risk, dealers could not deduct any net operating losses against other business income if the at-risk rule applied," he added.

One such operating loss for computer and other equipment dealers is depreciation which, in the early years of equipment life, usually exceeds net income, Manello explained.

Collective Effort

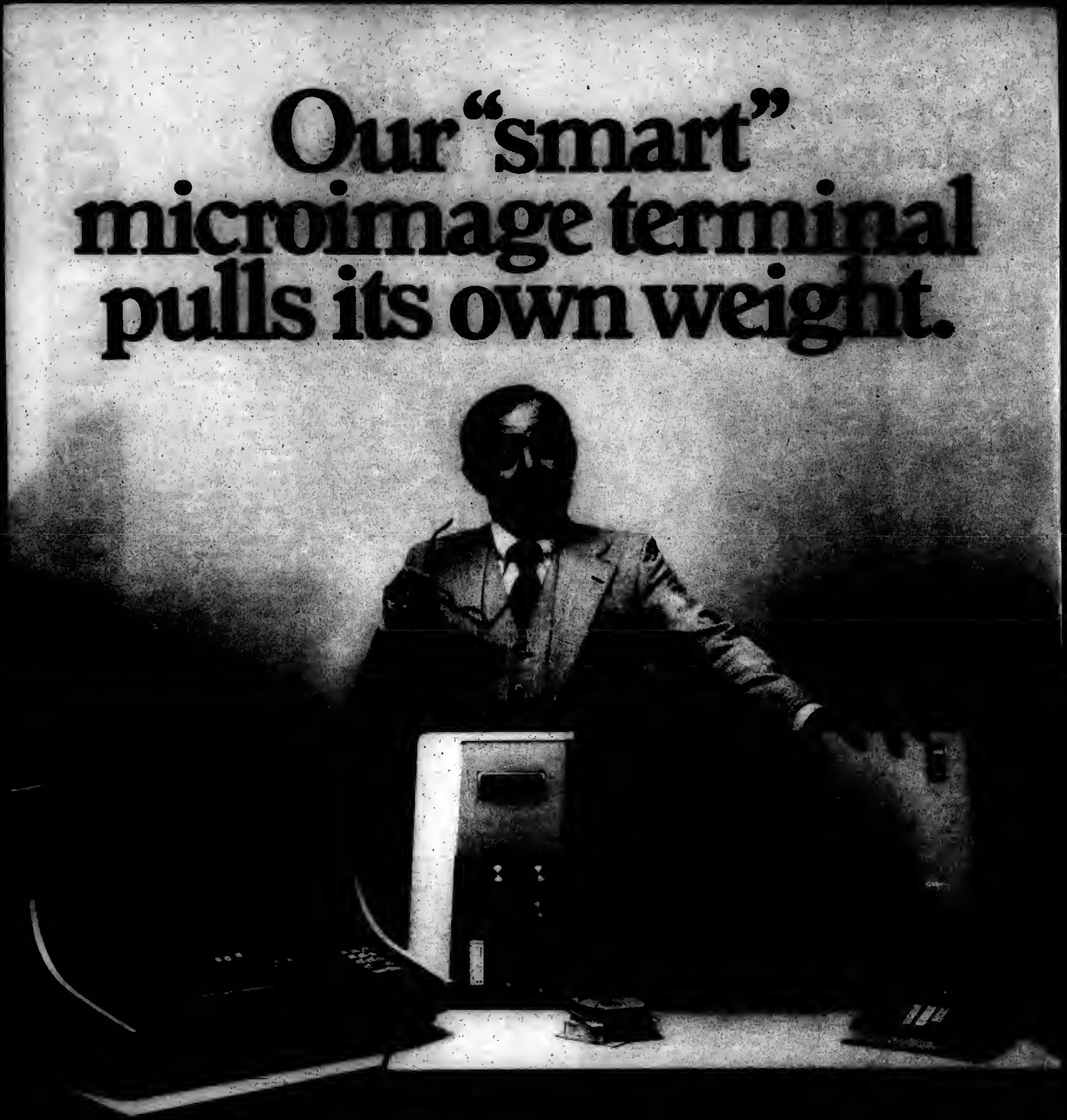
Initially, "a lot of associations such as rent-a-car people were individually fighting the extension of the at-risk rule," Ragland said.

The CDA, however, got these people together in a collective effort, he noted, to take the issue "out of the area of special interest groups."

What they got for their efforts, Ragland said, was another amendment to the bill which stated: "However, the equipment leasing activities of closely held corporations will not be subject to the at-risk rule if such corporation is actively engaged in equipment leasing. That is, if 50% or more of the corporation's gross receipts are derived from equipment leasing.

"For purposes of this provision," it further

(Continued on Page 63)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IBM, Nigeria in Venture

ARMONK, N.Y. — The Nigerian government has accepted in principle a plan for a joint venture between IBM and various Nigerian enterprises, according to IBM. If approved, the move will be IBM's first joint venture with foreign nationals, a spokesman admitted.

Spurred by the requirements of the Nigerian Enterprises Promotion Decree of 1977, the plan calls for the formation of a company, Data Processing Maintenance and Services, Ltd (DPMS). IBM will hold 40% of the shares of DPMS and will offer the remaining 60% for sale to Nigerian enterprises, the spokesman said.

At present, IBM is doing business in Nigeria through its wholly owned subsidiary, IBM Nigeria. DPMS will provide maintenance for IBM data processing equipment, as well as data services and DP systems engineering.

IBM intends to appoint a DP sales agent in Nigeria, the spokesman said. IBM said it seeks to comply with the law in each country in which it does business.

M.I.S. CONSULTING SERVICES

Massachusetts Bay Transportation Authority solicits letters of interest and statements of qualifications from persons or organizations capable of designing a Personnel Management Information System.

Services required will include:

1. Detailed review of current procedures and systems
2. Assessment of user needs
3. Evaluation of needs for conversion/modification/replacement of present systems to accommodate user needs
4. Development of functional specifications for the M.I.S. project along with documentation

The above services are not inclusive and will require the consultant to provide sufficient specification and documentation to enable the Authority or the consultant to search and evaluate commercially availale software packages versus in-house development.

The statement of qualifications should include in the following format:

1. Firm name and address
2. Name, title and telephone number of principal to contact
3. Balance sheet or published financial statement
4. Date firm was established
5. Type of ownership and if minority owned
6. Name of parent company, if any
7. Summary of consulting services and fees for the last two years
8. Work by firm which best illustrates current qualifications relevant to this project. List each project on a separate page indicating:
   - a. Nature of project and consultant's responsibility
   - b. Nature of client's responsibility
   - c. Client's name and address
   - d. Duration and completion date of project
   - e. Estimated cost — entire project
   - f. Estimated cost — work for which firm was responsible
9. Supply resume of employees that could be assigned to project and their responsibilities

Firms may submit additional information which will assist the MBTA in its evaluation.

Those firms adjudged most qualified will be furnished a more detailed scope of services statement and requested to submit technical and price proposals.

Closing date for this invitation is Friday, November 24, 1978 - 4:30 PM.

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Consideration will also be given to each firm's internal affirmative action policy, the use of minority businesses in Joint Venture or as subconsultants.

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Third-Party Lessors Not Daunted By Skyrocketing Interest Rates

By Marcia Blumenthal
CW Staff

When the cost of capital skyrockets, the demand for leased equipment quickens. Even with high interest rates, lessors are confident they can find the capital to finance the additional equipment needed to meet that demand, they said in recent interviews.

But the lessors interviewed did not appear to be basking in bonanza fever. They admitted banks and other funding sources will probably become more selective in granting loans, which could hurt some smaller leasing firms.

For example, financial institutions may hesitate to make loans to lessors featuring equipment from less well-known manufacturers, according to Donald Mikesell, product director of capital equipment leasing at Commercial Credit-McCullagh Leasing, Inc. Mikesell also pointed out, however, that many small leasing firms are very aggressive and are managed with a high degree of professionalism.

Rationing Feared

Sonny Monosson, president of American Used Computer Corp., is concerned about the prospect of banks rationing funds. Recently returned from a convention of the American Association of Equipment Lessors, Monosson reported that Peter C. Fitts, president of Citicorp Leasing, warned lessors they could expect aggressive competition from banks in all sectors of the equipment leasing market.

Those lessors financing equipment leases will find severe competition from leasing subsidiaries of banks, Fitts told convention-goers.

The degree to which lessors will be affected by the selectivity of moneylenders depends on how firmly a lessor's sources of financing are in place, according to Olie Swanky, president of Greyhound Computer Corp. Smaller leasing firms may not have access to the variety of funding sources used by larger companies, Monosson remarked, citing as an example double-signed notes with insurance companies used by larger leasing companies.

On the other hand, if the supply of money tightens, lessors may find a good market for used equipment, Swanky remarked.

Swanky said he is looking forward to a slowdown because it makes people more selective: "The 1974 crunch forced users to make better analyses of price/performance ratios."

Lessors with portfolios of older equipment may stand to reap better returns than they would if the emphasis were on new equipment, Swanky added.

Expensive But Available

Whatever stratosphere interest rates enter, the user will have to absorb the cost of capital. Kenneth Pontikes, president of Comdisco, Inc., said users would be willing to absorb those costs.

"Capital is expensive, but it is available," Pontikes remarked, observing that capital was not available in 1974.

Like many Wall Street observers of the computer industry, lessors are counting on companies going ahead with DP expenditures realizing that the productivity and cost savings gained from using computer systems are a trade-off to the marginal costs of capital incurred in financing that equipment.

Industry to Weather Recession

(Continued from Page 57)

Another Wall Street observer, who asked not to be identified, noted that today's computer products are more credible than those of 1974 and 1975 and are in the early stages of their lifecycles, still attractive to users.

Another factor which may quell the move toward leasing, that analyst pointed out, is that the purchase-rental ratio of computer equipment has improved dramatically since 1975. In 1975, for instance, a 40- to 50-month rental was required to equal the purchase price of the equipment. Now that time period has dropped to 30 months.

Carter Campaign

Although the Carter Administration has asserted that its inflation-fighting campaign will not cause a recession, which is defined as two consecutive quarters of falling national output, private economists are not so sure.

Citibank economists are predicting that Carter's meaures to defend the dollar on world money markets may cause the nation's money supply to tighten, causing a recession by mid-1979.

Otto Eckstein, president of Data Resources, Inc., said that "for the first time in my life I am predicting a recession."

Whether the computer industry will fare as well as industry experts think remains to be seen, but a clue may be gained from Kenneth H. Olsen, president of Digital Equipment Corp.

At the company's recent annual meeting, Olsen said "the future is something we don't see clearly, and we don't believe the people who do. We're planning for all possibilities."

For the next year, Olsen predicted "far less than the 40%" growth the company had in 1978.

Executive Corner

- Timothy J. Conroy has been named vice-president of corporate services at Software International Corp.
- William W. Dryfoos has been promoted to director of federal marketing at Inforex, Inc.
- Louis J. Finnegan has been named eastern regional sales manager for Xylogics, Inc.
- Matt Stein has joined Estey-Hoover advertising and public relations agency in Newport Beach as an account executive.
- Robert A. Weaver has been appointed vice-president of finance at Wordplex, Corp., a wholly owned subsidiary of AES Data Ltd. of Montreal, Canada.
- Donald M. Edam has been named vice-president and general manager of Applied Digital Data Systems' new Draper, Utah, facility.
- James P. Campbell has been appointed to the position of vice-president of administration at Data General Corp.
- Michael Clements has been promoted to vice-president of engineering at Amdahl Corp.
- Dharam Ahuja has been named product line director at the Large Systems Group at National Semiconductor Corp. James Ashbrook has been appointed manager of market planning and strategy at the firm.

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POS Market Seen Topping $2.4 Billion by '82

WALTHAM, Mass. — By 1982, the dollar value of the installed base of all segments of the point-of-sale (POS) equipment market will top $2.4 billion, boasting installations of more than 720,000 devices.

The collective POS market grew 23% in dollar value and 20% in the number of units installed between 1976 and 1977, according to a recently published report from International Data Corp. (IDC) here. By the end of 1977, a total of 316,000 POS devices were installed in the U.S., up from the 1976 count of 262,000.

The discount and specialty store sectors, both offshoots of the giant general merchandise sector, have the most promising future, IDC predicted.

While the use of POS equipment is now trickling down to the smaller, low-volume end of the retail industry, POS vendors are transforming the traditional general merchandise and supermarket sectors with the introduction of second-generation POS equipment which incorporates Universal Product Code (UPC) scanning and electronic funds transfer (EFT) capabilities, IDC noted.

This development, according to *Autotransaction Industry Report* (AT/IR), an IDC publication, coincides with the growing maturity of POS in the general merchandise sector. In fact, AT/IR pointed out, 94% of general merchandise POS installations are in department stores, and industry experts believe that sector is 70% saturated.

NCR Corp. has captured the leading market share in both the general merchandise and supermarket POS sectors, according to IDC.

Maturity Means Markets

One of the older markets, POS has overcome user and consumer resistance, slow development of source-marking codes and conflicts between retailers and bankers and among retailers themselves, AT/IR said.

The growing maturity of the POS industry is spurring acceptance of POS devices in new market segments. By 1982, IDC predicted, the number of POS devices installed in discount stores will top 46,000 units, with a value of nearly $140 million.

The specialty store sector is even more promising, with a projected 1982 unit installation volume of 31,000 devices accounting for more than $170 million.

The use of low-cost microprocessor-based equipment is the ripple spreading this trend. The result is cheaper machines offering considerable power to small retailers who don't need extensive systems backed by mainframes or minicomputers, AT/IR reasoned.

For example, Data Terminal Systems Corp.'s Model 150 electronic cash register has 4K bytes of read-only memory with 64 random-access memory locations and is priced at $795, AT/IR noted.

Traditional Sectors

While POS equipment is gaining wider acceptance among smaller retailers, the more traditional general merchandise and supermarket sectors are not napping.

The number of general merchandise terminals installed at the end of 1977 increased 16% from the previous year. The major action was in the supermarket sector, IDC noted, with year-end installations darting ahead 59% from 1976, racking up a 51% dollar value increase for a total of $210.8 million at the end of 1977.

By 1982, IDC predicted, general merchandise POS will still be the largest sector, with an installed base valued at over $1 billion and annual growth of 11%. However, supermarket POS will grow 20% between 1981 and 1982 alone, IDC estimated.

Second-generation equipment incorporating scanning capability will be in demand, AT/IR predicted. There are now about 300 supermarkets nationwide with UPC scanning, and that number is expected to double by the end of this year.

Ironically, AT/IR pointed out that Univac's decision to discontinue its Accuscan supermarket POS system because of the slow growth of UPC scanning came at just the time when UPC scanning is starting to proliferate. AT/IR reported 36 scanning sites were started in August.

The healthy market for POS equipment is fattening the coffers of NCR, which currently holds 36% of the general merchandise installed base, according to IDC. NCR has taken over market dominance in the general merchandise sector from the defunct Singer, AT/IR said, suggesting that with Singer's machines now ready for replacements, competition is heating up.

TRW, Inc. and ICL, Inc. are the two leading contenders for the Singer replacement business, AT/IR said.

In the supermarket sector, NCR dominates with 59.7% of the market and National Semiconductor Corp. follows with 25%.

AT/IR forecast a replacement for NCR's aging Model 255 and noted that National Semi's Datachecker is well received by supermarkets, but said the company appears to be constrained by limitations in its marketing and maintenance forces.

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Software Firms in Need of Systems Personnel

By Marcia Blumenthal
CW Staff

ORLANDO, Fla. — Unless software companies can attract systems personnel in greater numbers, the growth of that sector of the computer services industry will suffer.

An informal *Computerworld* poll of representatives from software development firms during the recent annual meeting of the Association of Data Processing Service Organizations, Inc. (Adapso) corroborated that view and revealed that many positions for systems personnel in those companies are currently unfilled.

Adapso President-elect John Imlay, who is also president of Management Science America, Inc. (MSA), noted that a major mandate for Adapso's Software Issues Committee is to seek ways of attracting personnel to the industry.

The dearth of applications software in the marketplace was made embarrassingly explicit during a conference session as executives from major mainframe and minicomputer companies practically begged software vendors to write applications software compatible with their hardware. Burroughs Corp., Honeywell, Inc., Data General Corp. and Digital Equipment Corp. were among those hardware makers seeking software.

While not disparaging hardware makers who are now investing in software development, Imlay said their approach has been to develop software so they can sell hardware. To be a successful competitor in the industry, he said, hardware companies must set up separate corporate entities or divisions which do not relate the software aspect of the business to the hardware side of the business.

There are currently about 676 independent software vendors. The typical vendor in this group, according to Imlay, has been in business eight years, has about 30 employees and markets one to two software products. Because most of these companies are small, he continued, they cannot afford to develop applications that will run on several different vendors' hardware.

Consequently, software developers tend to write applications that can be run on the largest installed base of computers — those from IBM, with the result that other hardware vendors have lots of machinery but very little software to run on it, Imlay noted.

Rustling Up Interest

While hardware makers are hot on the trail of applications software, software companies are trying to rustle up interest in the software industry, particularly among recent college graduates. Imlay said he spoke to 19 college audiences last May attempting to attract students to the industry.

Why hasn't the software industry been able to attract new personnel? Well, for one thing, the concept of standardized packaged software is just starting to become widely accepted. When the software industry started, it didn't have much of an image, and most DP installations had a "not made here attitude," he said.

Graduates entering the job market cannot readily identify with the software industry, he observed. Consequently they are absorbed into DP installations or into software research and development for hardware manufacturers. "Many recent graduates want a stable environment with plentiful resources," Imlay declared.

"If a systems analyst is willing to move around from project to project rather than being confined to one installation, he or she will gain a broad sense of the industry and will be able to develop state-of-the-art technology by learning what potential users want a system to do," Imlay observed.

The "freedom to do what you want" theme is the marketing tack independent software firms are taking, Imlay noted, adding, "When software people see the systems they have created sold several times, it gives them a great sense of pride."

SI Division to Serve Small Systems Needs

ANDOVER, Mass. — The demand among small systems users for applications software for stand-alone and distributed DP functions has resulted in the formation of a new division of Software International Corp. (SI).

In making the announcement, SI President William G. Watson said, "The new division is a complete organization dedicated to providing and supporting applications software systems to users of the most popular small business computers and minicomputers."

Donald K. Lane, formerly executive vice-president of SI, heads the new division.

SI began offering its general ledger and financial reporting, accounts payable and accounts receivable applications products to users of small systems more than a year ago, Lane said. Since then, the company's sales have been 155% better than projected, he added.

Now all of the company's financial applications products are available for both small and large systems. "Computers for which our packages are now or will soon be available include IBM System/3 and System/34, the Hewlett Packard Co. 3000, the Univac 90/30, Honeywell, Inc.'s H62, Interdata's 7/32 and 8/32, Burroughs Corp.'s B1700/1800, ICL, Inc.'s 2903/2904 and the Wang Laboratories, Inc. 2200," Lane said.

The company expects to supplement its financial packages in the near future with manufacturing applications software products.

Contracts

General Automation, Inc. has received a contract from the Montana Energy and MHD Research and Development Institute, Inc. to design, develop and install a distributed data acquisition network valued at more than $1 million.

Kennedy Co. has been awarded a contract in excess of $250,000 by Seiko of Tokyo, Japan for its Model 9100 tape transport to be used in Seiko's IBM Series/1-based small business systems. This agreement is for two years with renewal options.

Paradyne Corp. has received a lease contract from Tennessee Building Products for implementation of a PIX-II "virtual data link." The three-year contract is valued at $39,600.

General Telephone & Electronics Corp. has been awarded a five-year contract by Paine, Webber, Jackson & Curtis, Inc. for its GTE Financial System One. The system will be installed in the brokerage firm's 149 offices throughout the country.

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Selling Information Products Arm

Omron Sets Deadline on Purchase Inquiries

CHICAGO — Parties interested in acquiring the Information Products Division of Omron Electronics, Inc., a Sunnyvale, Calif., facility that manufactures user-programmable CRT terminals, have until 5 p.m. Thursday, Nov. 30, to submit inquiries for details regarding the division's sale, the company said.

The cutoff date was established to assure an orderly consideration of inquiries received since the divestiture plans were made public on Oct. 18, according to Omron executive vice-president Robert J.J. Gaudio.

"Several large, terminal-oriented and DP equipment manufacturers have begun discussions on possible terms of purchase," Gaudio explained, "but other interested parties continue to appear. In order to move negotiations ahead with qualified bidders, we must exclude any inquiries received after the end of this month."

Customers Notified

All customers of the Information Products Division have been notified of Omron's divestiture plans, Gaudio added.

The division maintains all design and manufacturing operations in Sunnyvale and sells to U.S. markets through a direct sales force of eight Omron representatives plus 12 independent representative firms. Sales and service offices are in: Englewood Cliffs, N.J.; Washington, D.C.; Schaumberg, Ill.; El Segundo and Sunnyvale, Calif.; and Seattle.

Has Been Profitable

The Information Products Division has been profitable, Gaudio noted, contributing 12% to 15% of Omron Electronic revenues. With current employment at around 110, the unit has grown steadily since its founding in 1973, developing both design engineering and software capability.

The division's sales are exceeding forecasts. Its recently introduced Model 8038 Uniscope Emulating Terminal has been well received, the firm noted. The division remains one of the few independent CRT terminal manufacturers to lease equipment directly to commercial and governmental accounts, with a profitable lease base now in existence, Gaudio said.

"We are divesting primarily because the unit is no longer aligned with the growth plans and direction that have been established for Omron Electronics, Inc. Long-range plans place top priority on components for the industrial automation marketplace," he explained.

Firms Exempted From Tax Ruling

(Continued from Page 57)

stated, "equipment leasing gross receipts is to include gross receipts derived from the sale and servicing of the same type of equipment leased by the corporation."

Also affecting the CDA was the bill's tax limitation provision regarding investment tax credit. This provision increased the investment tax credit limitation from 50% to 90% on a phased-in basis of 10 additional percentage points per year, beginning with taxable years which end in 1979. In addition, the used property limitation was increasd from $50,000 to $100,000.

Not to Exceed 50%

Before, the federal government allowed anyone who buys capital equipment to deduct 10% of the equipment cost from taxes immediately, Ragland said, but the amount of tax credit accumulated in one year could not exceed 50% of the firm's earnings.

The House of Representatives made the proposal to add the additional 10% per year through 1982, at which time the maximum amount of tax credit allowed for one year would be 90% of earnings.

Sen. Russell Long (D-La.), chairman of the Senate Finance Committee, wanted that 90% maximum to start next year instead of in 1982 to spur capital investments, and "We were in perfect harmony with Sen. Long," Ragland noted.

Spur Capital Investment

Getting the 90% right away, he said, would "spur corporations, dealers and leasing companies to make capital investments in computers and also have the ripple effect of freeing more used computers that dealers could sell or lease to smaller companies that may not be able to afford new computers."

He estimated the used computer market at about $1 billion.

The House proposal was made permanent, but Ragland maintained, "We'll be back next year to get the 90%. This year, we were 'Johnny-Come-Lately,' trying to jump in at the 11th hour and do a Mexican hat dance."

However, Ragland thinks he will have a better shot at it next year if, as expected, 1979 brings a recession. During a recession, he said, "the first thing that goes is capital investment and I have no doubt that the tax limitation would then go to 90%."

Looking back.
And ahead.

All indications have it that 1978 will go down as another banner year for the computer industry. User spending for 1978 should at least match the IDC — projected $42+ billion, up 15% from 1977. Budgets in almost every major category show increased growth over 1977, and 1979 is shaping up to be a repeat performance.

Our December 25/January 1 Combined Issue Special Report takes a look back at the year in computers, as well as a look ahead for 1979. The *Computerworld* editorial staff will take a break from the holiday season just long enough to give you some hindsight and foresight on topics like:

- *The impact of inflation on computer use and configuration*
- *User-vendor relations*
- *Market trends — products projections for '79*
- *The year in court — IBM and Memorex*

If you're concerned with the trends in the computer industry, you won't want to miss our Year-End Review and Forecast. And if you market products for the computer world, here is a good place to advertise. Color close is December 8; black and white close, December 15. Your *Computerworld* representative can give you all the details, and assistance in ad planning. Or, to reserve space, call Terry Williams at (617) 965-5800.

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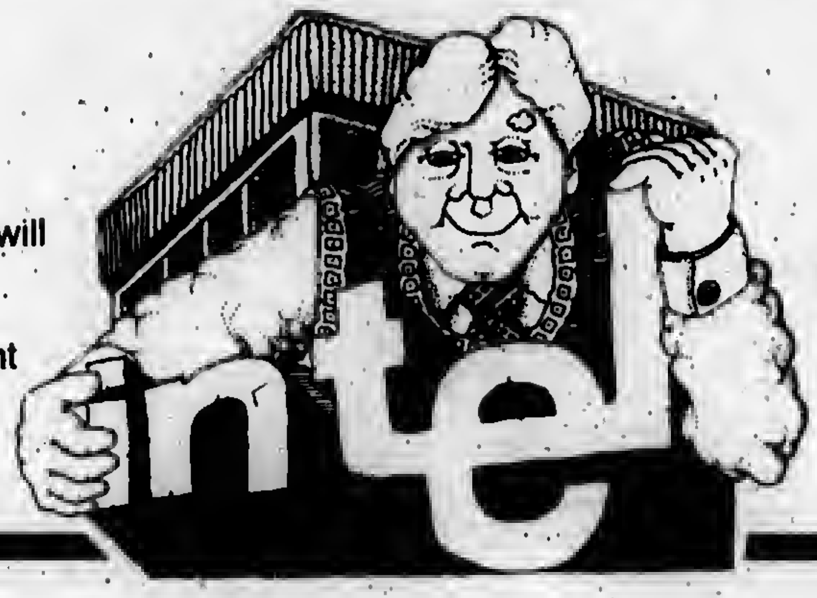

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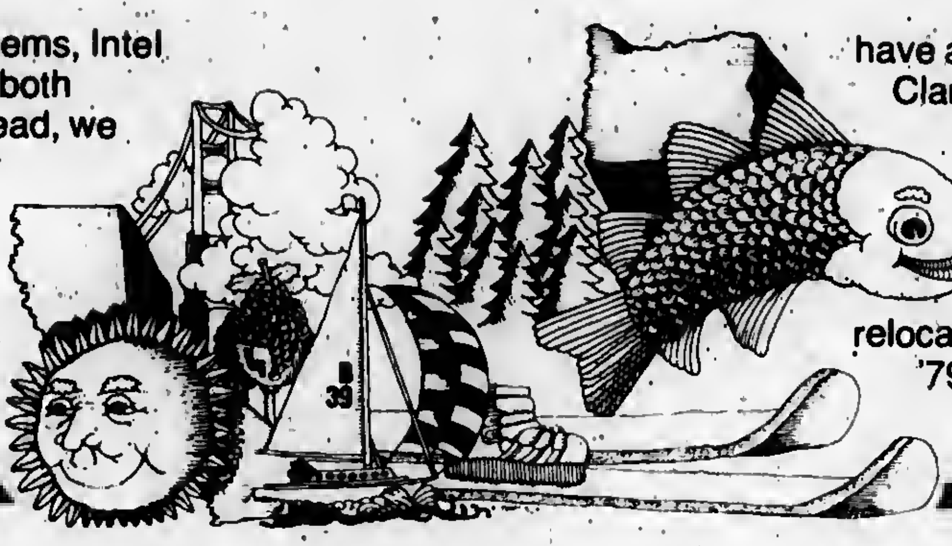

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We need aggressive, self-motivated EDP experienced Marketing Managers looking for top corporate visibility. Must be capable of managing and implementing imaginative product development projects, supporting them and bringing them to the field, generating enthusiastic response, and aggressive sales efforts. Responsibilities will include existing and new computer products and systems. You must have 8-10 years of experience in the computer marketplace, including a strong computer sales track record. Good communications skills are required for presentations to top level management. Your background must also include development, planning, or promotion of computer hardware/software products.

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We are looking for a number of individuals throughout the country to maintain and support our Wang VS computer system. The individuals we seek should have a minimum of 2 years experience in the maintenance of various medium to large scale computer systems, as well as the maintenance of sophisticated computer peripheral equipment. An ASEE or equivalent is required.

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At Wang, we've developed a remarkably sophisticated interactive business computer system. It's called the Wang VS, and it's the kind of large system that the marketplace has been waiting for. If you have large system sales experience, familiarity with corporate data centers, and the expertise to work with experienced data processing professionals, there's a place for you on a Wang VS sales team. A proven track record in hardware/software sales is required. Positions are located throughout the country.

Field Analyst

We need individuals who can support corporations and work with both their management and their technicians. You will be required to make corporate product presentations, conduct product demonstrations, determine configurations, and work with our sales personnel to develop proposals. The individuals we are seeking should have experience in IBM 370s, COBOL, BAL, some form of RJE, and either CICS or IMS. Experience with BASIC and/or RPG-II would be of added benefit. Openings exist for various geographic regions.

Marketing Specialists

We need EDP professionals who can provide technical sales support to Wang's worldwide field sales organization on our new VS computer. Data processing experience is a key requirement. You will need competitive knowledge of the computer industry and of commercially oriented large-scale sophisticated computer systems plus a technical understanding of computer hardware and software. Bring with you good communications skills, a proven track record of successfully supporting an aggressive field sales organization, and a college degree; and we'll show you individual growth opportunities you have been waiting for. Previous sales/marketing experience with a vendor would be a definite plus.

Marketing Analyst

We are currently looking for an individual for our marketing development group who will be specifically responsible for increasing our market penetration within the manufacturing industry. Analysis and recommendation of software offerings along with the responsibility to manage activities with our advertising, systems development, training and sales departments requires an individual with strong communications skills. The ideal individual should have a successful sales background in the data processing industry, experience selling to manufacturing firms, and a good understanding of general business applications. Corporate marketing experience plus an MBA are highly desirable.

We offer excellent salaries and benefits. Please submit your resume, including salary history and indicating position or positions of interest, to Gary C. Bionglewicz, Manager Professional Recruiting, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851; or call him at (817) 851-4111.

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Computers
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SYSTEMS PROGRAMMER

The Touchette Corporation
Syracuse, New York

TOUCHETTE needs qualified Systems Programmer with a minimum of three years' experience in OOS/VS, POWER VS systems generation. Responsbilities would include Sys Gen, Software Evaluation and Planning, and Technical Support.

**Salary Open—
Company-Paid Benefits
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University of Nebraska's Nationwide Survey rates Syracuse #1 in New York State. Call collect or send resume to:

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The Touchette Corporation
5701 Enterprise Parkway
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Telephone: (315) 445-0291

Programmer Analyst

We are looking for a professional who desires advancement and takes pride in personal accomplishments.

We require at least 2-3 years Burroughs COBOL experience. Oata managemant experiance in DMS 2, or FORTE preferred. Ideal candidate could be promoted to Systems Analyst within 1 year.

We offer a competitive starting salary and excellent company benefits. Please send resume in confidence to, or call:

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Minimum of two years of Administrative Data Processing with a knowledge of Oata Base Systems and COBOL. Experience with Burroughs B6700, Burroughs COBOL and ALGOL highly desirable.

Outies include working directly with administrative users to implement, modify and maintain the programs and systems for their offices.

$14,500-$16,000 plus excellent benefits and FREE TUITION.

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- **Microprocessor Applications**
- **Digital and Analog Circuits**
- **Electrical Control Circuitry**
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Familiarity with microprocessor programming helpful for all positions.

PROGRAMMERS/ANALYSTS

- **Microcomputers**
- **Minicomputers**
- **Operating Systems**
- **Distributed Processing Systems**
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Requires background in Assembly and COBOL languages.

We offer an outstanding compensation and benefits package, wide open career paths, and a location that offers friendly, lower-cost midwestern living at its very best.

**Please send resume and current salary requirements promptly to:
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Complete Computer Systems

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Position requires a minimum of 3 years OS applications, with high proficiency in ANS and COBOL. Must have personally designed, programmed and installed a multi module medium to large scale OS application. Other helpful experience would include on-line transaction applications (CICS), interactive programming (VM/370), BOM, MRP, shop floor, costing, inventory, and structured designing and programming.

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For confidential consideration please forward resume and salary requirements to: Harris Corporation, Web Press Division, Personnel Manager, Mechanic St., Pawcatuck CT 02891.

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Beckman Instruments, Inc., a leading manufacturer of medical and scientific instrumentation needs additionel systems programmers to maet company axpansion requirements.

As a Systems Programmer, you will provide support to Deta Processing in tha areas of MVS, Jes 2, on-line, TSO, program products, RJE, ITEL AS/6, 370/158 and other miscallaneous hardwera and software. Actuel experiance in generation or maintenence in some of these areas is desireble, but 1-3 years applicetions background with e strong desire to be involved with system software may qualify you for one of these positions.

Send resume and salary history to Jerry Stenger.

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BECKMAN INSTRUMENTS, INC.
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COMPUTER SCIENTISTS & SOFTWARE ENGINEERS

WHO ARE WE?

One of the San Francisco Bay Area's fastest growing software systems developers wants you to consider the oppportunities that we have for exceptionally qualified software professionals like you.

WHAT TECHNOLOGY ARE WE USING?

A strong program that blends IR&D, contracts and internal projects gives us the opportunity to participate in technological developments at the leading edge of software science. Our current high-technology contracts include:

★secure operating systems development ★distributed data -base studies
★computer network architectures studies

Here are some of the areas which are particularly important to Western Development Laboratories.

UNIX-based* Software Engineering
—PWB/UNIX
—Development support systems
—Software development tools
—Specification languages
(*UNIX is a trademark of Bell Laboratories)

Reliable Systems Technology
—Formal specification & program verification
—Secure computer systems
—Test and validation

Distributed Systems Technology
—Data base management systems
—Real-time data collection/synthesis
—Local network architectures
—Network protocols
—1 to 200 MPBS bandwidth

Operating Systems Architecture
—Capability-based systems
—Network systems
(micro, mini, midi, maxi)

WHAT JOBS DO WE HAVE?

Systems Development Programmer
You will use modern systems programming languages running in PWB/UNIX environment to develop operating systems, software tools, DBM's, and network implementations. These positions provide excellent opportunities for technical growth.

Operating System Designer
You will draw upon your experience with several operating systems, your academic training, and your aiblity to conceptualize and communicate in order to design and specify a new class of operating system. You will learn to express your design in a formal specification language and to subject your specifications to rigorous analysis.

Software Test Specialist
You will break new ground in design of test methods for provably secure systems. Using your familiarity with modern software testing methodologies, you will interact with the systems design team. As a result, you will become familiar with formal mathematical specification techniques for software.

Software Methodology Specialist
You will work in a PWB/UNIX environment to create tools to make the software development process more exact and less error-prone. Yor major contribution will be the direction of research and development that leads to the next generation of software tools.

Programming Language Specialist
Your knowledge of modern compiler-building technology and formal languages will be used in the evaluation and development of systems programming languages for use in support of our reliable systems technology efforts.

Computer Facility Manager
Your experience in systems configuration, maintenance, and operations will be used as you manage the Software Engineering Laboratory that presently consists of two large PDP-11 configurations running PWB/UNIX.

Software QA Specialists
You will use your knowledge of MIL-S-52779 and modern software QA systems to develop and apply WDL-wide software QA methodologies. Knowledge of modern systems development practices and high level systems programming languages is also required.

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If you have a BS, MS, PhD or equivalent related experience in one or more of the technology areas we've discussed, we'd like to talk with you. At Western Development Laboratories you will receive the professional recognition you deserve, excellent compensation, and one of the best fringe-benefits packages in the industry.

WHAT ARE YOU WAITING FOR?

Please send your resume and salary requirements to: Professional Employment, Dept. PF-110, 3939 Fabian Way, Palo Alto, CA 94303. Or call (415) 494-7400, ext. 6601 for immediate consideration. We are an equal opportunity employer, m/f. U.S. Citizenship Required for most positions.

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You must have a minimum of 2 years experience, including IMS, in an IBM environment, preferably in manufacturing areas. Responsibilities will be varied.

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Prefer a minimum of 2 years experience including IMS with IBM equipment plus a knowledge of one or more of the following languages: COBOL, PL1, and FORTRAN.

We offer qualified candidates excellent starting salaries and comprehensive company-paid benefits including paid relocation to Iowa. For consideration, direct your inquiry with salary history to:

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Comm Systems Engr	$35K
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Systems Programmers	$26K
Systems Analyst (APL)	$24K
Programmer Analyst	$22K

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7921 Jones Branch Drive
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EDP SPECIALISTS

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Fischer & Porter, an expanding leader in the commercial process control industry, has several key positions available for talented software professionals to develop advanced digital systems with the assistance of modern software technology such as:

- **An Interactive, UNIX* based computer network**
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To qualify you should have a technical degree, preferably advanced, with experience in one of the following areas:

- **Distributed System Architecture**
- **Portable Operating Systems**
- **Interactive Graphics**
- **Compiler Design**
- **Data Base System Design**
- **Software Tools**

We can offer you an excellent salary, a complete benefit package, a highly professional environment and an opportunity for technical career enrichment.

Our modern systems center is surrounded by a number of attractive communities offering excellent schools, shopping and cultural activities, plus the advantage of nationally known resort areas such as the Pocono Mtns. and the New Jersey seashore, all within a convenient drive.

To apply for one of these positions, or for further information:

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Any Time Day or Night

or send your resume to Mr. Tom Haines, (Dept. C) FISCHER & PORTER CO., E. County Line Road, Warminster, Pa. 18974. An Equal Opportunity Employer.

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User Support For Scientific Programmers

The Engineering User Services Department of Hughes Corporate Data Processing has an immediate opening for a scientific computing consultant.

Major responsibilities will consist of providing programming and debugging assistance to scientific computer users, conducting seminars and short courses in FORTRAN, TSO, JCL, and other programming subjects. Other duties will include writing user documentation, participating in software product evaluation, and software quality assurance.

A Bachelor's Degree in mathematics or related science is mandatory. The qualified applicant should have experience in FORTRAN, PL/1, TSO, and OS or VS JCL.

Good communication skills, and an ability to work well with people required. Teaching experience is highly desirable.

Please send resume to: Ground Systems Group, Employment, Dept. 63-CW, P.O. Box 3310, Fullterton, CA 92634.

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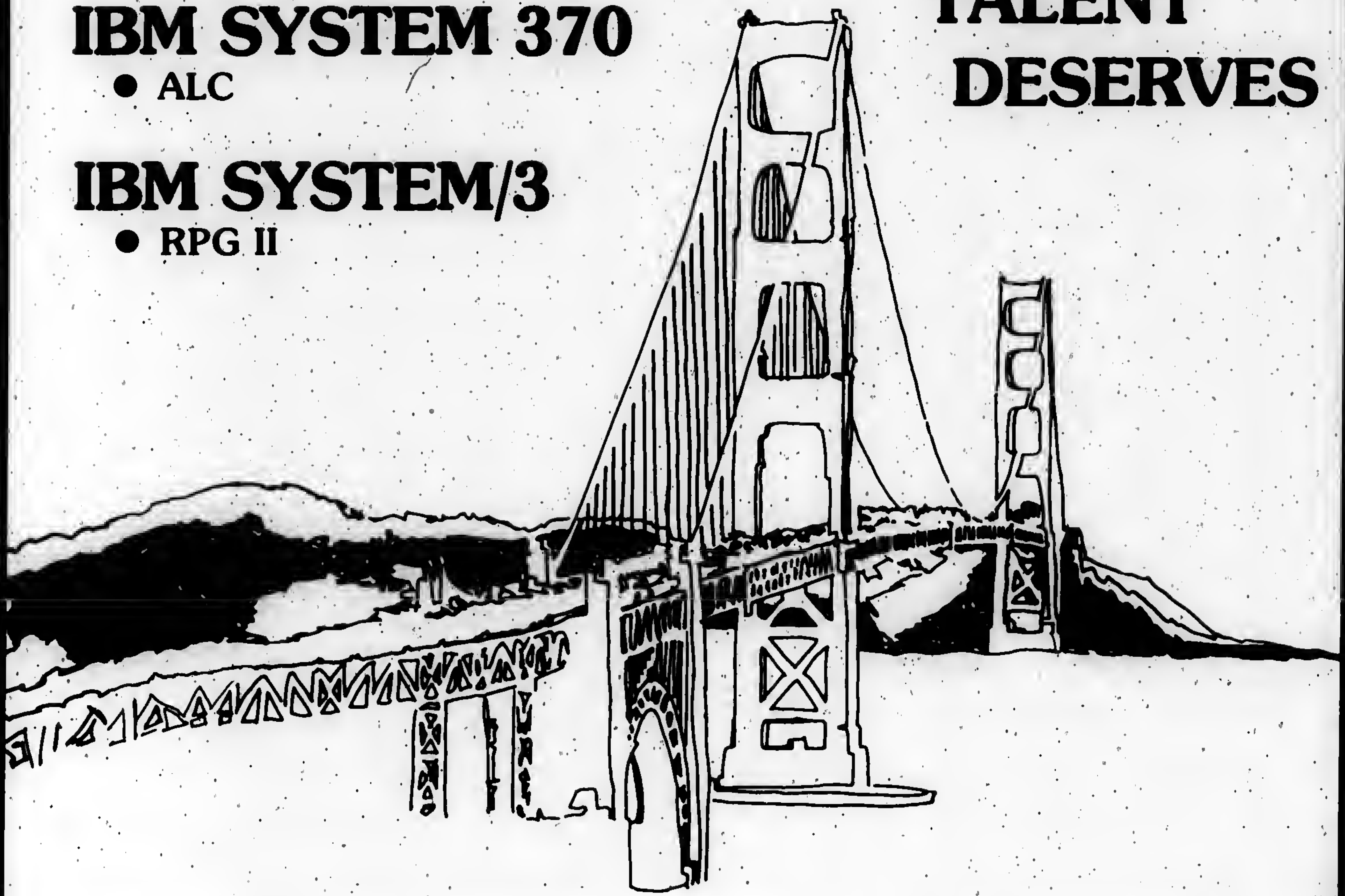

We are seeking Programmers/Analysts with 2 to more than 10 years' experience to design and develop business applications as well as the maintenance and enhancement of existing on-line systems.

Please call (415) 768-3196 (collect) or send resume in complete confidence to: Tom E. Lyon, Bechtel Corporation, Dept. 15-29-8, P.O. Box 3965, San Francisco, CA 94119.

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Entry and Senior level positions. Analysis, design, specification, and evaluation of message and packet switched networks. Knowledge of minicomputers and programming languages desirable.

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SYSTEM TESTING

Senior and Junior positions for individuals with software experience. Must be effective contributor in evaluating and establishing test methods and procedures to include automated testing concepts.

SIMULATION

At least 3-5 years' experience in the area of computer network simulation and systems analysis. Development of static and dynamic communication system and computer performance models. Strong programming and mathematical background is required.

**Western Union will be recruiting at
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Applicants should have at least a BS degree. An advanced degree in Operations Research, Computer Science or Electrical Engineering is desirable. Salaries will be commensurate with experience and education. Submit resume, in strict confidence, to: Mr. T.E. Simon, Director of Administration, Dept. CW 1120.

**Western Union
Government Systems Division**

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western union

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Mark IV

We are seeking two Mark IV programmer/analysts to become part of our new Task Team in Manchester, N.H. You must have 2 to 3 years experience as a Mark IV programmer/analyst in an insurance environment, with a solid knowledge of special features and experience with OS/VS1, VM/CMS, and IBM 370/158.

Programmer/Analyst

You must have 3-5 years experience including 370 OS background, with insurance experience as a definite plus.

Assistant Computer Support Services Analyst

Problem solving, communication skills and operations experience are required for results-oriented positions. Strong background in 370/158, OS/VS1, VM/CMS is preferred. Knowledge of Value Computing would be a plus, while knowledge of JCL is required.

American International Group Data Center is the data processing arm of one of the world's foremost insurance organizations currently doing business in over 130 countries around the world.

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EASTERN

DATABASE DESIGN SPECIALIST

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Applicants should have a college degree with extensive database design and administration experience in an online environment. IMS database design experience preferred. Exposure to other DB/DC software is a plus, particularly TOTAL-ENVIRON/1 and/or UNIVAC DMS.

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National Software Consulting Firm seeking Programmer/Analysts for their Mid-Atlantic clients with 2 to 10 years experience and at least two of the following technical requirements: COBOL, OS, JCL, CICS, MARK IV, TSO, IMS, BAL on IBM 370 or 360 hardware. Please submit resume and add a note with your salary requirement.

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DATA PROCESSING

CAREER OPPORTUNITIES

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Champion International, a major forest products company, is experiencing continuing growth of our distributed processing systems and increased development of our large-scale computer projects. Our expansion in these areas has created many challenging and rewarding opportunities for Data Processing Professionals with college degrees or equivalent experience in the following areas:

PROGRAMMERS & ANALYSTS

Positions require at least 2 to 7 years experience in business applications. ANS COBOL and OS JCL skills preferred, but not mandatory. Minicomputer experience a plus.

OPERATIONS ANALYSTS

Positions require at least 2 to 5 years experience in applications or technical programming. IBM JCL skills are necessary. An interest in the technical side of data processing would be beneficial.

STANDARDS SPECIALISTS

You must have good oral and written communication skills together with the ability to interact effectively with others. Responsibility will center on developing data processing standards and procedures for MIS department.

MINICOMPUTER SOFTWARE PROGRAMMER

You will be involved in software development on IBM Series/1 minicomputer. Responsibility will be for writing software for our distributed processing systems.

OS SYSTEMS PROGRAMMER — IBM S/370

Position requires 2 to 5 years systems programming experience. A background in performance measurement and telecommunications would be beneficial.

SHIFT SUPERVISOR—COMPUTER OPERATIONS

Two years of college is preferred, together with a required 3 years experience in computer operations or a related data processing field, such as programming or systems; prior supervisory experience is beneficial. You will supervise the employees and operations of the computer center.

In addition to an excellent working environment, we offer competitive salaries commensurate with your education and experience, plus a generous fringe benefits program including company-paid medical and dental insurance and a non-contributory retirement program.

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Champion International Corporation

We take affirmative action towards equal opportunity employment

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DATA PROCESSING

Director Data Processing

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We offer an excellent starting salary, a wide range of benefits and the opportunity to play an important role in our continued expansion process.

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The requirements for this position include e thorough understanding of todey's office operation and proceduras coupled with in-depth tachnical knowledge of the state-of-the-art in office eutomation. Prior work history should include a minimum of 5 yeers experience in word processing equipment evaluetion end selection, systems enelysis and programming and femiliarity with environmentel conditions, fecilities end menegement controls that permit office functions. Understending of recent developments in the smell computer field is desireble.

Sand resume including salary history in confidanca to:

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  Sr. P/A needed for e 370 instellation located in e beautiful Coastal community. OS COBOL required. Strong desire for POS or Telecommunications. Full relocetion. to $22,000.
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- **SOUTH BAY**
  Lerge corp seeks IMS & CAD/CAM anelysts. Requires either engr'g or mfg applications exp. Work is in on-line & communication networking system. to $32,000.

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SYSTEMS ANALYST
FOR PRIME COMPUTER

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Personnel Administrator
Box HY
NUS CORPORATION
4 Research Place
Rockville, Maryland 20850

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CSC

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If you'd like to find out about the opportunities available to you at the System Sciences Division of Computer Sciences Corporation, call us today. We can provide experienced professionals with the competitive incomes they seek, plus a generous fringe benefits package, and an excellent location in the Maryland suburbs just outside of Washington, D.C.

Positions Currently Open Include:

- IBM 360/OS System Generation and Maintenance
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- Physical Optics

These positions are in support of our Mission Support, Science and Applications, and Goddard Real-Time Systems Projects at the NASA Goddard Space Flight Center.

For immediate attention, please send you resume or call:

Staffing Department C-102
TOLL FREE: 1-800-638-0842
OR Call Collect: (301) 589-1545

COMPUTER SCIENCES CORPORATION

System Sciences Division
8728 Colesville Road
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Software Marketing

If you have a successful sales track record in the Data Processing Industry, preferably in software sales, the Cullinane Corporation would like to hear from you. The ideal candidate will also have a public accounting background and an advanced degree.

The Cullinane Corporation needs qualified Marketing Representatives to fill a number of positions that have been created through a major expansion of the Audit and Retrieval Systems Group.

Cullinane offers a very attractive compensation plan, a comprehensive benefits package, and opportunity for growth into sales and marketing management.

Applicants should send a detailed resume to Bob Wilbur, National Marketing Manager, Audit and Retrieval Systems Group, Cullinane Corporation, 20 William St., Wellesley, Massachusetts 02181.

We are an equal opportunity employer.

Audit Software: Cullinane

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For the results-oriented professional who possesses significant background in manufacturing systems, an exceptional career opportunity in state-of-the-art systems analysis can be found at SOLAR TURBINES INTERNATIONAL.

As a major operating group of a Fortune 500 company, Solar offers competitive salary, relocation assistance and an outstanding total benefits package.

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Requires several years experience in designing, programming and implementing manufacturing systems. This should include applications such as inventory control, shop order control, purchase order control, MRPS bill-of-material, standard cost, and capacity planning. Data base knowledge is desired.

Preferred is a degree plus familiarity with COBOL on a large scale IBM system.

PROGRAMMER ANALYSTS

Requires at least 2 years of COBOL programming in a manufacturing environment with strong background in the design and implementation of data base systems.

If you have the expertise we seek, please send us your resume including salary history and expectations. Applications will be acknowledged.

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Central Illinois Bank, $281 million, seeks #2 man in EDP Department. Must be trained in systems design, programming and operation of IBM 360-370 computer, model 35 or larger. Minimum two years banking experience and supervisory background. Send resume to Personnel Department, First National Bank of Springfield, 5th & Adams, Springfield, IL 62701. An equal opportunity employer.

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Metro area, multi-division mfg corp of health prods needs strong mgr to direct hq & div level systems. Small to med scale systems, mfg & acctg pkgs. Low travel, reports to V.P. Finance. Salary low $30's. Immed intv.

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N.J. corp hdqtrs has need for a sr level, mfg, EDP oriented individual. Responsibilities will be to develop and plan systems needs for multiplant environment. Degree and several years EDP req'd. This is a career oppty with one of N.J.'s leading corp. Salary range is at the $30K level.

F—O—R—T—U—N—E
EDP Division
agency 505 5 Av, NYC 10017

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Excellent opportunity for professional to participate in the planning, installation and support of 3033's using MVS. Additional responsibilities include support of current operating system and associated functions. Environment consists of multiple RJE batch and online locations both domestic and European countries. Experience with MVT, MVS or VS and BAL required. Knowledge of COBOL, Fortran, TSO Telecommunications or Data Base are additional assets

Send detailed resume and salary history in confidence to:

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PROGRAMMER ANALYST

We are a rapidly growing, major Bank Data Services Corporation located in Florida. We are seeking two technically qualified, highly motivated, Professionals to work in our IBM, DOS/VS environment. Bank applications should include Loans and/or Deposit Systems. These are career opportunities offering competitive salaries and an outstanding benefits package. Our employees know of this ad. Please submit resume complete with salary history, in confidence to:

CW Box 1784
797 Washington St.
Newton, Ma. 02160
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PROGRAMMER/ANALYSTS

Candidates must be familiar with structured programming and/or design techniques, as well as a variety of high level languages. We seek individuals who will maintain the currency of their knowledge of computer sciences while utilizing their excellent basic skills. Positions are available in all levels in both Montpelier, Vermont and Denver, Colorado.

DATA BASE DESIGNER

We are seeking a versatile and creative individual to work on the design of a large, complex, integrated data base. Previous involvement with this type of design effort is required, as well as experience with a variety of DBMS protocols. Knowledge of data base structuring must be current and thorough. This position is in Denver, Colorado.

Our company is a well known leader in public policy analysis and research. We are currently engaged in several major projects, including the automation of public welfare administration in several states. Our approach is interactive, distributed, and includes an extremely flexible software design.

Candidates can expect salaries ranging from $17,000 to $30,000 and excellent advancement possibilities.

We will be holding interviews for qualified candidates during the week of the ACM Conference, Dec. 4-8, in Washington, D.C. Please call Pam Tarwater at (303) 837-1500 (collect) for an appointment.

If you are not going to be in Washington, D.C., please send your resume, salary history, and location preference to:

Placido Herrera
Mathematica Policy Research
1410 Grant St.
Denver, CO 80203

MINI/MICRO PROGRAMMERS

Hercules Incorporated of Salt Lake City, Utah has immediate openings for mini/micro programmers.

The successful candidate will develop, implement, and support automated real time application systems for data acquisition, data reduction and reporting. Efforts include problem definition, software design/development, and hardware interfacing. This position requires a technical BS degree and knowledge of structured design/programming desirable. We offer a comprehensive benefits program.

Work and live in Salt Lake City, the city known for its healthy family environment and outstanding cultural and recreational opportunities. The center of scenic America.

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DIVISION D.P. REPRESENTATIVE

Philips Industries, Inc., with a headquarters in Dayton, Ohio is a manufacturer of quality products and components for the building industry. Sales this year exceeded $240 million. Our system provides information services for over 30 locations.

Working in a rapidly growing organization, you will report to the Corporate Manager of D.P., and work on-site at one of our operating divisions acting as liaison between the division and D.P. You will be responsible to work with the management of that division for a definition of business required to support them in the operation of their division. You will also be deeply involved in the analysis, design, and development of business systems with heavy emphasis on manufacturing.

Degree preferred or equivalent work experience with formal systems. Must have heavy D.P. programming and systems experience in manufacturing applications, such as MRP, Shop Scheduling, Cost Control, etc. Ability to perform technical systems design is a must, and experience with IMS data base preferred.

FOR PROMPT ATTENTION
Please call collect or send resume to:

Bonnie Filoso

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Dayton, Ohio 45401
(513) 253-7171
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CAREER OPPORTUNITY AT

AVCO COMPUTER SERVICES

Avco Computer Services, one of the largest and fastest growing New England based data centers, has a current requirement for a:

MANAGER TECHNICAL SERVICES

We are seeking an individual with appropriate experience in a large data center environment to coordinate our System Support/User Support activity, direct the system performance evaluation program and supervise all tele-processing functions. This position is also responsible for hardware and software planning and installation.

Avco is a national supplier of large-scale computer services and supports a variety of customers throughout the United States.

Our present environment includes an IBM 370/158 AP, IBM 370/158 MP, running MVS/JES 2 Multi-Access Spool, RJE and TSO.

The successful candidate should have a minimum of 5 years supervisory background in a large data center environment with several years of IBM MVS/JES 2 experience. In addition to strong writing and verbal skills, an understanding of end-user requirements is essential.

Avco offers an excellent salary compensation plan and provides an opportunity for professional growth in a creative environment. Our benefit program includes full tuition reimbursement for advanced education.

Forward your resume including salary requirements in confidence to:
Mr. Peter C. Dowd
Employment Supervisor

AVCO COMPUTER SERVICES

201 LOWELL STREET
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We Must Be Doing Something Right

In 1BB5, George Parker invented his first game in the basement of his Salem, Massachusetts home. We've been growing ever since. Today, we're a subsidiary of General Mills, and we are the second largest game manufacturer in the world. Parker Brothers is certainly doing something right.

Our continuous pursuit into new technologies has kept us growing, and will continue to do so. Recently we have entered the electronic game market providing new excitement within the company, and a chance for you to grow. Talk to us, it's the right thing to do.

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Reporting to the Manager of Information Systems, this position will interface with all levels of management to identify and translate user requirements into systems specifications, and provide technical supervision to subordinates.

Qualifications include a Bachelor's degree, five years experience in design and analysis of manufacturing systems, and a working knowledge of COBOL.

Programmer Analyst

An exciting opportunity exists for you to advance your career in the Financial Systems section of Parker Brothers. Here is a chance for you to utilize your talents in the analysis, design, and implementation of new systems, with some responsibility for existing systems. You will also be responsible for providing programming and analysis support, and for translating user requirements into defined business systems.

Two to five years of solid COBOL programming experience, preferably with a background in financial systems analysis, and the ability to communicate effectively is required. Analysis training and financial systems experience would be a plus.

If you are interested in these exciting positions with the company that does things right, please send your resume to:

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PARKER BROTHERS

PROGRAMMER/ ANALYST

The Anaconda Company is seeking an experienced scientific Programmer/Analyst to provide support for engineering and operations personnel involved in copper mining, milling, smelting and refining activities. Responsibilities include systems design, programming and supporting documentation. Applicants should have at least two years FORTRAN programming background and some experience in systems analysis and design. College degree in Physical Science and/or job related experience in mining industry preferred. Experience in COBOL, ASSEMBLER, IBM 370 computers, DOS/VS, CMS and statistical analysis would be an added plus.

In addition to an excellent salary and fringe benefit plan, this position will be located in beautiful South West Montana affording the successful candidate a small city environment with unlimited outdoor recreational opportunities. For immediate consideration please send your resume in confidence to: The Anaconda Company, Dept. GR, 555 17th Street, Denver, Colorado 80217. We are an equal opportunity employer m/f.

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Our data processing system consists of Dual Honeywell 6660's operating under GCOS and IDS II. It extends through all ereas of IBP's operations from basic financial systems to 4 process control operations which totally run our material hendling systems. This department is expanding rapidly end right now we are seeking the following additions to staff:

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You should have at least 2 yeers of COBOL programming experience and et least 1 year of experience involving systems design with emphesis on team leadership responsibilities for tha devalopment of a major computer system.

PROGRAMMERS

You must have a minimum of 2 years of COBOL experience working with large scale hardware.

Our progremmers receive challenges tough anough to satisfy the most ambitious. In addition, we offer an excellent compensation/benefits program that includes an annual cash bonus and relocation allowance. For more information, please send your resume in confidence or cell:

Walt Macieg
(402) 494-2061

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engineering

EMI

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As a leader in the field of computerized tomographic x-ray scanners, we currently have several positions available for Software Engineers with various levels of experience.

You should have a BSEE or Computer Science degree and at least one year of scientific programming using Fortran and assembly language on a mini-computer system. Our Systems require:

- Operating systems for instrument control.
- Machine-level programming of micro computer circuitry.
- Algorithms for image processing.
- Software testing and distribution to field sites.

These positions involve continual challenge in a small project group environment and are accompanied by an excellent compensation and benefit package.

If you qualify, and are interested in further career development, send your resume (including salary data) or call Steven Callisher at (312) 291-4434.

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4000 Commercial Drive
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SYSTEMS ANALYSTS DATA BASE DESIGN FORTRAN - COBOL

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WE OFFER:

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IF YOU QUALIFY, SEND YOUR RESUME WITH SALARY HISTORY TO DEPT. REG., RED LOBSTER INNS OF AMERICA, INC., P.O. BOX 13330, ORLANDO, FLORIDA 32859.

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BANK OF AMERICA HEADQUARTERS

In—house programming instructors needed for the following areas: COBOL, OS-370, ALC, STRUCTURED PROGRAMMING, DESIGN AND ANALYSIS. Salary commensurate with experience. Send resume to:

Dept. 3411, P.O. Box 37000 San Francisco, CA 94137.
ATTN: B. Rowe

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BANK OF AMERICA

COMPUTER SCIENCE DEPARTMENT

Permanent opening beginning Sept. 1979 at the instructor or assistant professor rank. Salary range: $11,937-$17,545. Duties include teaching beginning level and basic and upper level computer science courses in an applied computer science program and a background in Fortran and Cobol desired with some specialized experience. For instructor, Bachelor's in computer science or related field plus 15 graduate credits; for assistant professor, Master's in computer science or related field plus 10 graduate credits required. For instructor, three years of teaching and/or data processing experience; for assistant professor, four years of teaching and/or data processing experience required.

Please send applications to Gary L. Buterbaugh, Chairman, Computer Science Dept., Indiana University of Pennsylvania, Indiana, Pa. 15705, by Feb. 23, 1979.

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WARM AND SUNNY CENTRAL FLORIDA

Come and join a progressive county government in a rapidly growing area. The Polk County Information Systems Department is accepting applications for the following positions:

PROGRAMMER ANALYST I: Minimum of 2 years programming experience with team programming, writing user oriented programs, and familiarity with on-line systems $14,872 annually.

TECHNICAL SUPPORT PROGRAMMER/ANALYST: Minimum 2 years programming experience which includes a proficiency in programming in the following languages: COBOL, CICS and Assembler. $14,872 annually.

Applicants must be High School graduates with COBOL experience and preferably IBM training. Contact: Ms. Susanne Burley, Personnel Department, Board of County Commissioners, P.O. Box 60, Bartow, Florida 33830. (813) 533-1161, ext. 274.

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COMPUTER PROGRAMMER

Responsible and challenging position in a congenial educational environment to develop, maintain, and improve Administrative Systems and Programs. State-of-the-Art technology in Distributed Processing and On-Line Development utilizing both mini and large scale computers. Languages are COBOL, FORTRAN, and BASIC with plans for Data Base Systems. Benefits are superior and opportunity for advancement and personal growth is excellent. Requirements are a degree in Computer Sciences, Business Administration, or Mathematics, three years of intensive and progressive programming experience, advanced COBOL programming skills, ability to interface effectively with users and good written and oral communication.

Salary range is $13,000 - $17,500.

Send resume and inquires to Carl Holloman, Director Computer Services, Jersey City State College 2039 Kennedy Blvd. Jersey City, New Jersey 07305. Telephone number (201) 547-3352.

An Equal Opportunity Employer

CONSULTANTS/ INSTRUCTORS NEEDED

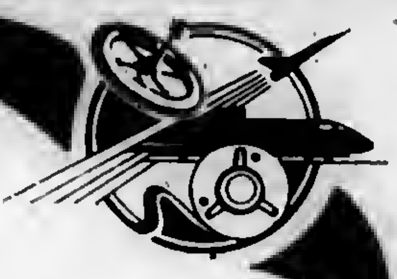
Consultants and/or instructors whose expertise is in but not restricted to the following fields are invited to submit outlines for these topics: DATA BASE MANAGEMENT SYSTEMS • ON LINE PROCESSING SYSTEMS • COMPUTER MICROFORM • DATA PROCESSING MANAGEMENT • MINI COMPUTER EVALUATION AND SELECTION CRITERIA • DATA COMMUNICATIONS • ON LINE REAL-TIME SYSTEMS DESIGN • MICRO PROCESSORS

We will require services for 2 to 3 day seminars given several times per year. Must be able to instruct at the highest level and communicate with experienced personnel in the field.

This is a unique opportunity for national and international recognition and compensation with a renown and prestigious sponsor.

For consideration please send a brief outline (2 to 3 pages) of each seminar you can teach plus a copy of your bio.

CW Box 1766
797 Washington St.
Newton, MA 02160



AiResearch Manufacturing

Phoenix, Arizona
Has Immediate Openings For

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- Systems Analysts
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Plan and perform analysis of major company activities and guide the subsequent design and implementation of systems in a large highly technical manufacturing and engineering company. Knowledge of transaction processing, data base design and manufacturing, engineering and financial systems is desirable. Current equipment is a 370-158; software is OS/VS1; total data base management system environ/1 teleprocessing monitor.

Paid moving and travel allowance plus extra company benefits.

Send resume of experience to C.W. Tindell, Employment Administrator, AiResearch Manufacturing Company, 3151 E. Airlane, PO Box 5217, Phoenix, Arizona 85010.

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INTERNATIONAL PROJECT TEAM

Ampex Corporation is creating an international project team to develop and provide data processing support for our worldwide marketing offices. We have immediate openings for:

Project Senior Programmer/Analysts

Programmer/Analysts

This team will be responsible for:

developing applications software for order processing, accounts receivable, accounts payable, inventory control and general ledger.

developing message switching software for European data communications network.

implementing these systems in our international subsidiaries.

Program development will be in BASIC on HP3000/III and the recently announced HP 300 systems.

If you are qualified for any of these positions, and enjoy international travel, please send a resume to C. Wright, Building 2, 2655 Bay Road, Redwood City, CA 94063. An affirmative action employer m/f.

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OPERATING SYSTEMS MANAGER

You will be responsible for managing the activities of the Operating Systems Group involving, design, installation and maintenance of operating systems software and associated software for a large computer center (360/370) in a University environment. Will also be involved in preparing hardware/software justifications, recommendations, and evaluations.

Requires a minimum of 6 years experience with strong technical knowledge and good managerial/leadership skills in planning, directing and supporting systems software. Must be knowledgeable in the areas of OS/VS, Hasp, online and telecommunications systems.

Resume should be sent to Beverly Mace, University of Nabraska Computer Network, University of Nabraska at Omaha, Omaha, Nabraska 68182.

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Ætna Life & Casualty has an immediate opening for an experienced Computer Based Education Author/Programmer. Applicant should have 1–3 years experience developing Computer Assisted and/or Computer Managed Instruction Courses using either the PLATO TUTOR or Coursewriter III languages. Instructional design, multimedia program development, or experience in developing insurance Data Processing Educational Programs are a definite plus.

Full Company benefits.
Send resume with salary history to Mark Grove,
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Manager
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$28,000 Range

370/OS, IMS Environment

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For Confidential Consideration Forward Resume With Present Salary

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BOX 623 COMPUTER PARK, HAMPTON, N H 03842

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Does your present employer regard you as a professional? If you think you should be a professional and want to change positions, programming for the "We Mean Business" Medical Computer Company is a Professional Career position as well as stimulating and rewarding.

* Senior Systems Programmer *
Qualifications: 3-5 years experience DOS Systems Programmer
3-5 years experience On-Line System
3-5 years experience Data Base Management
Exposure to OS
Hardware: IBM 370-155, 360-65, Honeywell Level 6 MINI

* Data Base System Support Programmer *
Qualifications: 2-3 years experience Data Base/
DOS Systems Programmer
Exposure to ENVIRON/1 and TOTAL is a plus
Hardware: IBM 370-155, 360-65, Honeywell Level 6 MINI

If you fit one of the two opportunities as listed, and if you are looking for a career opportunity with a Dynamic nationwide corporation providing data processing management services to the medical industry, AND if you want to relocate to a clean, family-oriented community with good schools and churches, but close to the big cities yet have immediate access to year-round vacation spots, then . . . please submit a resume and letter with your salary requirements to:

Chuck Mills,
Adm. Services Manager
Computer Consulting Service, Inc.
P.O. Box 1278
Dubuque, IA 52001

CCS
The 'we mean business' medical computer company.

TECHNICAL SUPPORT REPRESENTATIVE

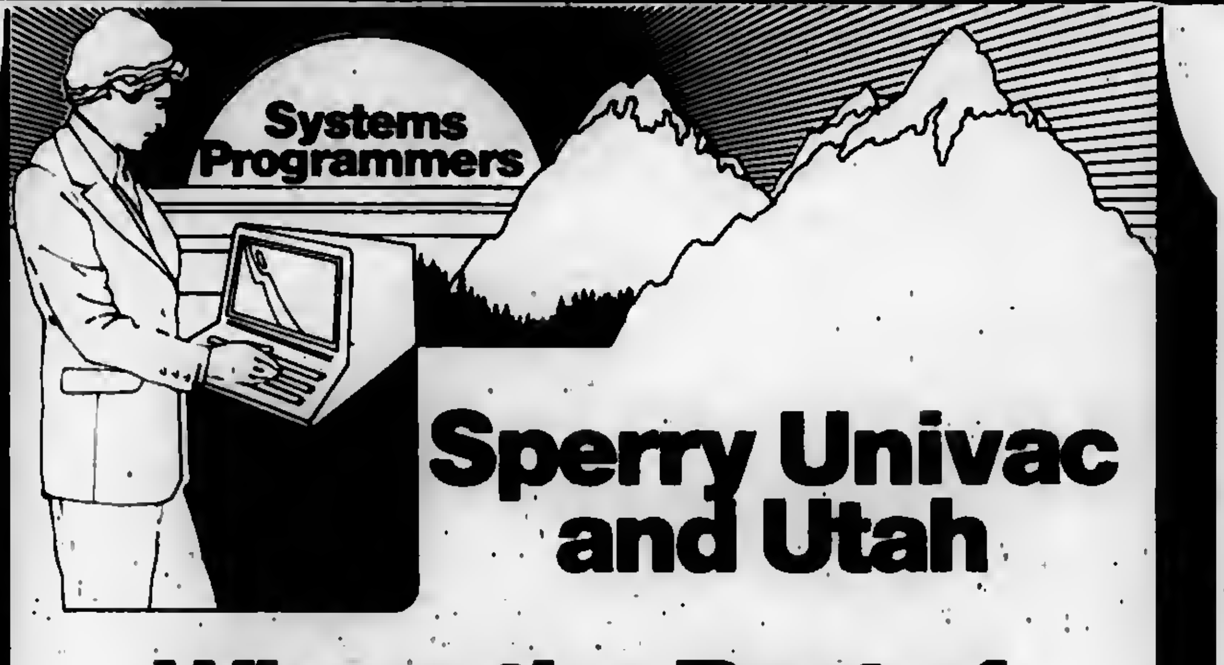
The Computer Software Company, a leader in operating systems, data base management systems and on-line systems, offers an excellent opportunity for the individual with a strong technical Systems Programming background in DOS or DOS/VS.

Accepted candidates will be trained to provide our customers with on-site and telephone systems programming/installation support for all TCSC products.

We offer an attractive starting salary, liberal company benefits, some travel, and association with other skilled DP professionals.

If this is for you, please write or call: Mr. Ernie Burnett, 804/276-9200.

THE COMPUTER SOFTWARE COMPANY
6517 EVERGLADES DRIVE, RICHMOND, VIRGINIA 23225
An Equal Opportunity Employer. PLEASE—NO AGENCIES



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WHERE we'll provide you the challenge of exploring the unexplored in meeting our communications and terminals need of today and in the future. WHERE you'll enjoy the excitement of a unique life style amid some of the most spectacular mountain scenery in the United States.

WHERE you can apply your analytical skills to the design, development, and implementation of systems software for data communications, networks, data entry, terminal handlers, and operating systems. Or participate in customer support of systems software for our communications and terminals products. Development will include formal design, documentation, coding and testing. BSCS or equivalent experience.

WHERE you will receive an excellent benefit package consisting of: Comprehensive medical and maternity; Life, dental and travel insurance programs; Retirement plan; Accident and sickness, sick leave and long-term disability (income protection); Paid holidays and vacation; Educational reimbursement; Stock purchase plan; Company-sponsored training programs.

Call toll free: **1-800-453-4534** or, send resume complete with salary history to:

Employment Department
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Salt Lake City, Utah 84116

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SPERRY UNIVAC

BURROUGHS B6800 SYSTEMS ANALYST

Must have experience with ALGOL, DMS 11. Desire GEMCOS and other Data-Comm experience. Excellent opportunity for the right person, with growth potential in a 2x2 B6800 environment. Send resume with salary required in first letter to

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Mild winters - low cost of living - no state income tax. PROGRAMMERS and ANALYSTS for business/financial systems on IBM OS hardware.

$16-24,000

Call Jim Fleming at 713-961-3271 or send your resume to:

ROBERT HALF
OF HOUSTON, INC.
"EDP Employment Specialists"
4801 Woodway, Suite 231W
Houston, Texas 77056

OREGON LEGISLATIVE INFORMATION SYSTEM

OLIS, leader in dp support to legislative process, opening for System Develop't Coordinator. Responsible for project development and implementation. Requires 5 years experience with IBM 360/370 knowledge of text editing and composition, facility with BAL, FORTRAN or PL1.

Resumes to: Legis Admin, S401 Capitol Building, Salem, OR 97310.

SENIOR PROGRAMMER/ANALYST

Minimum 5 years EDP systems and programming experience in the wholesale distribution industry. Must be proficient with COBOL and thoroughly familiar with IBM 370 systems using DOS/VS, Power V/S, and CICS facilities. Working knowledge of assembler language a definite plus. Requires a minimum of 2 years systems design and analysis experience. Excellent opportunity to progress to project leader quickly. Multi-division, rapidly growing company with EDP development staff located at corporate headquarters in progressive Southwestern Ohio city. Salary range $16K to $22K.

Equal Opportunity Employer M/F

Send resume in confidence to:
CW Box 1767
797 Washington St.
Newton, MA 02160

MANAGER DATA PROCESSING

DMI, Inc., an expanding farm implement manufacturer located in Central Illinois, is looking for an innovative, shirt sleeve individual to direct the activities of it's Data Processing Department.

You will have overall responsibility for organizational structure, policy, goals, and objectives, as well as evaluation of the department.

We require a minimum of 10-15 years experience in systems design, COBOL, RPG, on line application in a manufacturing environment and previous administrative responsibility.

We offer excellent starting salary and fringe benefit package to the qualified individual.

Send resume' including salary history to: DMI, INC. Route 150, East, Goodfield, IL 61742

IMS Database Consultants

To $30K—San Francisco

Our Bay Area client has 3 immediate openings for IMS Application Consultants. Positions require 5 years' experience in Data Processing with a minimum of 3 years' experience in architectural design, application program support, working with productivity aids, Data Base performance, tuning standards/procedures and exposure to internals. Relocation expenses will be paid and an excellent benefit package is included.

We are consultants to management. For immediate consideration, please send resume and salary history in confidence to: **Gery R. Schultz, One Maritime Plaza—Suite 1350, San Francisco, California 94111. (415) 956-7120.** Employer assumes fee.

professionals for computing, inc.

Head of Computer Center

Mississippi State University is seeking candidates for the position of Head of the Computer Center. Position responsibilities include management of a large-scale central computer, coordination with user personnel, leadership in systems development and long-range planning, supervision of approximately 35 employees, and the possibility of part-time teaching. Position also includes the possibility of academic appointment.

A large-scale Univac 1100 system provides computer support to teaching, research, service, and administrative data processing.

Applicants must meet the following requirements: doctorate in Computer Science or a related field; managerial, systems programming and/or programmer/analyst experience in large-scale computing; demonstrated state-of-the-art knowledge of computing.

Salary open. Send resume by February 1, 1979 to:

Dr. Fred Davis, Director
Division of Computing Affairs
Mississippi State University
P.O. Drawer CC
Mississippi State, MS 39762

Mississippi State University does not discriminate on the basis of race, color, religion, national origin, sex, age or handicap.

VICE PRESIDENT SOFTWARE

Rapidly growing $25 million turnkey systems company seeks individual to assume total responsibility for all software development and support activities.

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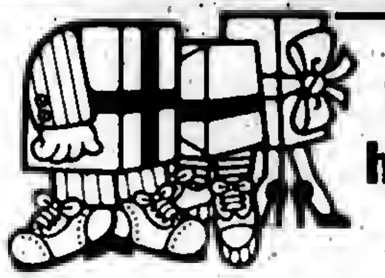

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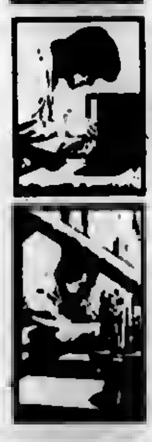

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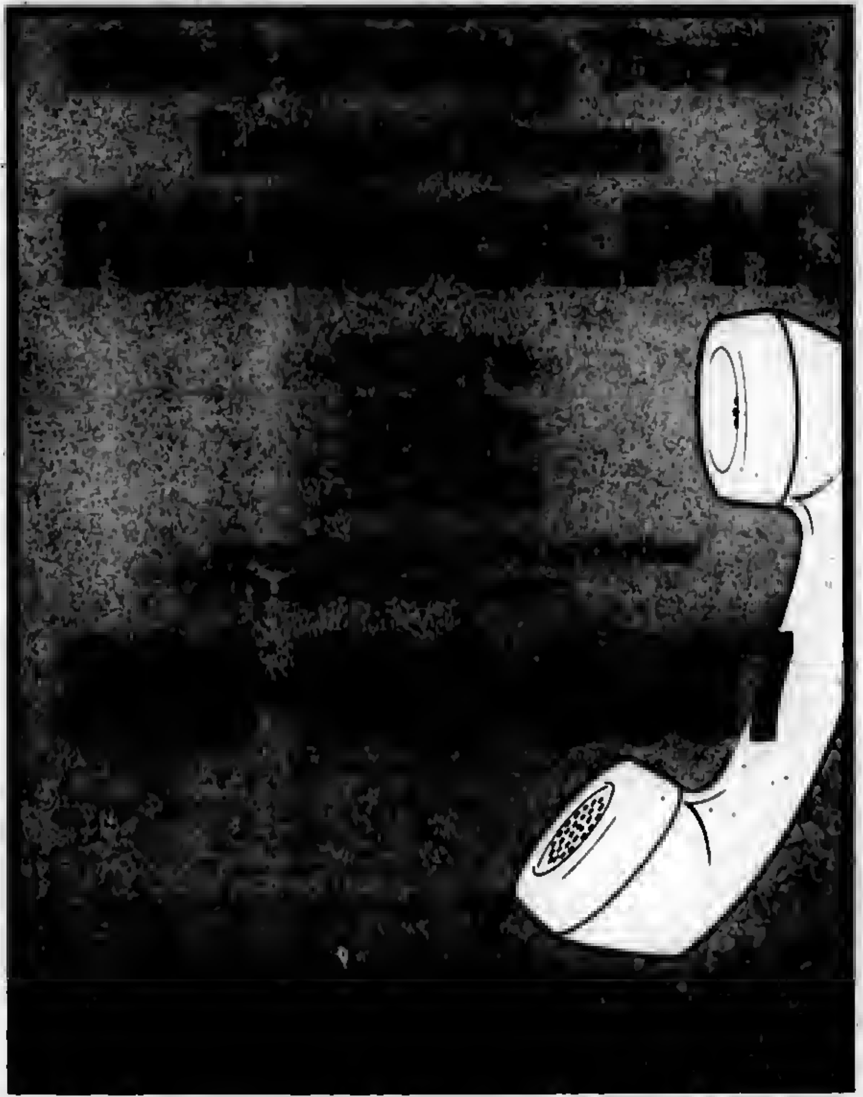

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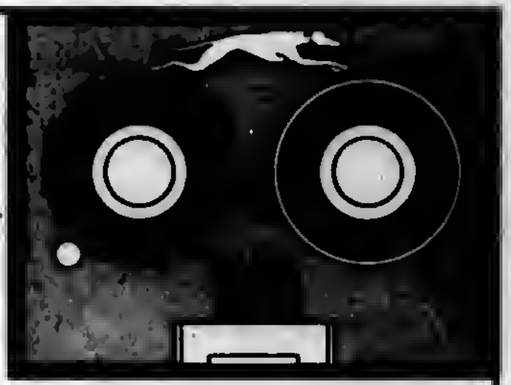

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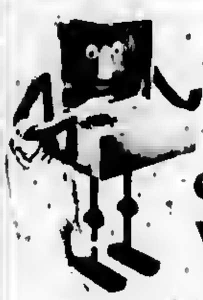

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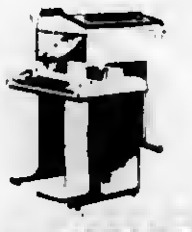

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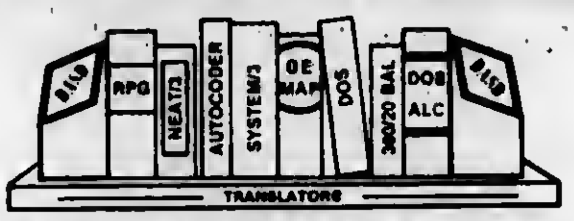

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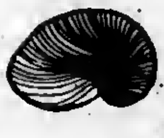

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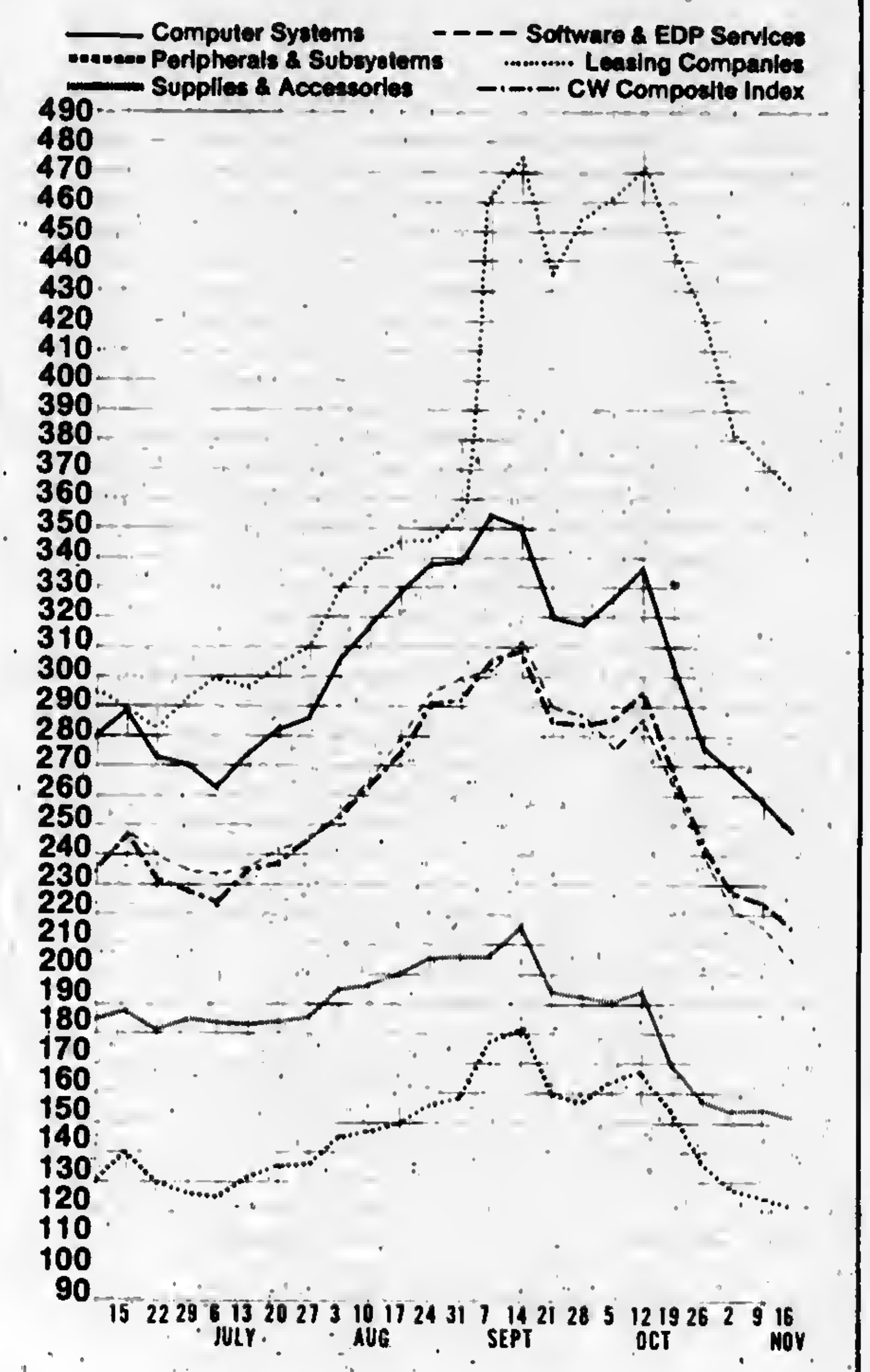

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	1976	1977
Shr Ernd	$.72	a$.33
Revenue	17,235,802	9,810,350
Earnings	3,380,810	1,550,887
8 Mo Shr	1.25	a.54
Revenue	30,844,482	17,678,578
Earnings	5,698,599	2,536,130

a-Adjusted for three-for-one stock split paid in January 1878.

HARRIS
Year Ended June 30

	1978	1977
Shr Ernd	$4.06	$3.12
Revenue	872,248,000	646,268,000
Earnings	52,188,000	40,058,000
3 Mo Shr	1.19	.88
Revenue	254,377,000	198,810,000
Earnings	15,479,000	12,487,000

NEWLETT-PACKARD
Three Months Ended July 31

	1878	1977
	(000)	(000)
Shr Ernd	$1.14	$1.07
Revenue	428,100	341,000
Earnings	33,200	30,500
9 Mo Shr	3.51	3.13
Revenue	1,211,500	980,900
Earnings	101,400	88,700

MONAWX DATA SCIENCES
Three Months Ended July 31

	1978	1977
Shr Ernd	$.24	$.25
Revenue	41,444,000	35,915,000
Spec Cred		e721,000
Earnings	1,861,000	1,892,000

e-Mainly from repurchases of debt

TELE-COMMUNICATIONS
Three Months Ended June 30

	1978	1877
Shr Ernd.	$.5	$.06
Revenue	15,212,000	12,920,000
aSpec Cred	578,000	284,000
Earnings	1,488,000	423,000
6 Mo Shr	.44	.11
Revenue	30,118,000	25,509,000
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Earnings	2,632,000	794,000

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CLOSING PRICES WEDNESDAY, NOVEMBER 15, 1978

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COMPUTER SYSTEMS

EXCH		1978 RANGE (1)	CLOSE NOV 15 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 89	42 5/8	-2 5/8	-5.2
N	BURROUGHS CORP	59- 8T	T0	-2 1/8	-2.9
O	COMPUTER AUTOMATION	15- 44	1T	0	0.0
N	CONTROL DATA CORP	23- 44	29 1/2	-2 1/4	-T.0
O	CRAY RESEARCH INC	21- 74	23 1/2	-2 1/2	-9.6
N	DATA GENERAL CORP	42- T1	55 1/8	- 1/4	-0.4
N	DATAPOINT CORP	34- T5	53	-2 1/2	-4.5
N	DIGITAL EQUIPMENT	39- 54	46 5/0	-1 1/8	-2.3
N	ELECTRONIC ASSOC.	2- 13	6 1/2	- 5/8	-8.T
A	ELECTRONIC ENGINEER.	9- 19	10 3/8	+ 3/8	+3.7
N	FOUR-PHASE SYSTEMS	19- 46	25	-2 3/8	-8.6
N	FOXBORO	28- 40	51	0	0.0
O	GENERAL AUTOMATION	7- 26	12 1/2	-1	-7.4
O	GRI COMPUTER CORP	1- 3	1	0	0.0
N	HEWLETT-PACKARD CO	62- 93	T8 T/8	- 5/8	-0.7
N	HONEYWELL INC	43- 72	61	- 1/2	-0.8
N	IBM	236-305	258 1/2	-T 3/8	-2.7
O	MANAGEMENT ASSIST	9- 29	15 3/0	-1 5/8	-9.5
O	MANUFACTURING DATA S	9- 23	17	- 5/8	-3.5
O	MICRODATA CORP	10- 23	15 1/2	-1 1/2	-8.8
O	MINI-COMPUTER SYST	4- 8	4 1/4	- 1/2	-10.5
O	MODULAR COMPUTER SYS	T- 17	T 1/2	-1	-11.7
N	NCR	3T- 67	57 1/0	-2	-3.3
N	PRIME COMPUTER INC	20- 43	26	-2 1/4	-7.9
N	PERKIN-ELMER	1T- 28	23 T/0	+ 3/8	+1.5
N	SPERRY RAND	33- 49	40 3/4	-1 1/4	-2.9
A	SYSTEMS ENG. LABS	11- 24	12 1/2	-1 3/8	-9.9
O	TANDEM COMPUTERS INC	13- 3T	24 3/4	- 3/4	-2.9
A	WANG LABS.	12- 32	20	-1	-4.T

LEASING COMPANIES

EXCH		1978 RANGE (1)	CLOSE NOV 15 1978	WEEK NET CHNGE	WEEK PCT CHNGE
C	BOOTHE COURIER CORP	13- 21	17 1/4	+ 1/4	+1.4
O	COMDISCO INC	5- 22	12 3/4	-1 1/4	-8.9
A	COMMERCE GROUP CORP	1- 1	3/8	0	0.0
A	COMPUTER INVSTRS GRP	1- T	3 1/2	+ 1/8	+3.T
O	CONTINENTAL INFO SYS.	5- 15	6 1/4	0	0.0
N	DATRONIC RENTAL	1- 3	2 3/0	0	0.0
A	DCL INC	3- 5	3 1/8	- 1/8	-3.8
N	DPF INC	0- 14	9 1/8	-1	-9.8
N	ITEL	16- 36	21 3/8	-3 3/8	-13.6
N	LEASCO CORP	24- 36	31 T/8	- 1/8	-0.3
O	LEASPAC CORP	1- 4	2 1/2	0	0.0
A	PIONEER TEX CORP	3- T	3 3/0	- 1/8	-3.5
N	U.S. LEASING	13- 20	13 T/0	+ 3/8	+2.T

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1978 RANGE (1)	CLOSE NOV 15 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1	0	0.0
O	ANACOMP INC	8- 22	10 3/4	-1 5/8	-13.1
A	APPLIED DATA RES.	8- 1T	9	- 5/8	-6.4
N	AUTOMATIC DATA PROC	24- 36	30	+ 7/0	+3.0
O	COLEMAN AMERICAN COS	1- 2	1	0	0.0
O	COMPU-SERV NETWORK	6- 12	6 1/4	+ 1/4	+4.1
O	COMPUTER HORIZONS	1- 9	5 1/2	- 1/4	-4.3
O	COMPUTER NETWORK	6- 16	6 1/2	-1	-13.3
N	COMPUTER SCIENCES	8- 17	9 5/8	- 7/0	-0.5
O	COMPUTER TASK GROUP	1- 4	3 3/4	0	0.0
O	COMPUTER USAGE	2- 4	2 1/8	- 3/8	-15.0
O	COMPUT AUTO REP SVC	4- 10	5 5/8	- 1/8	-2.1
O	COMSHARE	6- 19	12 1/2	-1 1/4	-9.0
O	CULLINANE CORP.	14- 33	14 3/4	-2	-11.9
O	DATA DIMENSIONS INC	4- 9	4 1/4	- 3/4	-15.0
O	DATATAB	1- 2	1	0	0.0
N	ELECTRONIC DATA SYS.	15- 25	18	+ 1/4	+1.4
O	INSYTE CORP	1- 3	1	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3 1/4	+ 1/4	+8.3
O	KEANE ASSOCIATES	3- 6	4 1/4	- 3/4	-15.0
O	KEYDATA CORP	1- 3	1 3/4	- 1/8	-6.6
A	LOGICOM	10- 19	10 1/4	- 1/4	-2.3
A	NATIONAL CSS INC	15- 36	22 T/8	+ 1/4	+1.1
O	NATIONAL DATA CORP	7- 13	8	+ 1/8	+1.5
A	ON LINE SYSTEMS INC	12- 30	13 3/4	-4	-22.5
N	PLANNING RESEARCH	4- 10	5 3/4	- 1/2	-8.0
O	PROGRAMMING & SYS	1- 1	1 1/4	- 1/8	-9.0
O	RAPIDATA INC	3- 7	4	- 1/2	-11.1
O	REYNOLDS & REYNOLD	18- 36	26 1/2	- 3/4	-2.7
O	SCIENTIFIC COMPUTERS	3- 9	5 1/2	- 1/4	-4.3
O	TYMSHARE INC	18- 33	23	- 1/2	-2.1
A	URS SYSTEMS	5- 0	5 7/0	- 1/0	-2.0
N	WYLY CORP	1- 7	3 3/4	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1978 RANGE (1)	CLOSE NOV 15 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	20 1/4	- 3/8	-1.8
O	ADVANCED MEMORY SYS	T- 18	10 5/8	-1 3/0	-11.4
N	AMPEX CORP	10- 19	15	+ 3/8	+2.9
O	ANDERSON JACOBSON	5- 10	5 1/4	+ 1/8	+2.4
N	APPLIED DIG DATA SYS.	9- 22	9	-1	-10.0
O	BEEHIVE INT'L	3- 7	2 5/4	- 3/4	-21.4
A	BOLT, BERANEK & NEW	6- 14	9 1/4	- 1/4	-2.6
N	BUNKER-RAMO	10- 20	12 1/8	- 3/8	-3.0
A	CALCOMP	3- 13	6 7/8	+ 7/8	+14.5
O	CAMBRIDGE MEMORIES	3- 9	3 5/8	- 1/2	-12.1
N	CENTRONICS DATA COMP	16- 37	24 1/8	- 7/0	-3.5
O	COGNITRONICS	1- 4	1 1/2	+ 1/4	+20.0
O	COMPUTER COMMUN.	6- 12	3 7/0	-1 5/8	-29.5
O	COMPUTER CONSOLES	4- 10	6	- 1/2	-7.6
A	COMPUTER EQUIPMENT	3- 6	3 5/4	- 3/8	-9.0
O	COMPUTER TRANSCEIVER	1- 3	3	+ 3/8	+14.2
O	COMPUTERVISION CORP	9- 30	21 1/4	+ 1/2	+2.4
O	COMTEN	9- 38	24 1/2	+1	+4.2
N	CONRAC CORP	14- 26	13 1/2	- 3/8	-2.7
O	DATA ACCESS SYSTEMS	3- 14	12 3/4	- 1/4	-1.9
O	DATA 100	9- 20	19 3/8	+ 1/8	+0.6
A	DATA PRODUCTS CORP	14- 25	14 1/4	-1 1/8	-T.3
O	DATUM INC	2- 6	2 5/8	- 1/4	-8.6
O	DECISION DATA COMPUT	2- 6	2 3/4	+ 1/4	+10.0
O	DELTA DATA SYSTEMS	1- 1	1 5/8	0	0.0
A	DOCUMATION INC	6- 34	17 5/8	-2 1/8	-10.T
O	DATARAM CORP	6- 52	20	- 1/2	-2.4
N	ELECTRONIC M & M	4- 9	4 1/4	- 1/8	-2.8
O	FABRI-TEK	1- 2	1 1/8	0	0.0
O	GENERAL COMPUTER SYS	1- 3	1 3/8	0	0.0
O	GENERAL DATACOMM IND	9- 21	10 1/2	0	0.0
N	HAZELTINE CORP	10- 1T	10 3/8	- 7/8	-7.7
N	HARRIS CORP	1T- 56	29 1/4	-1 3/8	-4.4
O	INFOREX INC	6- 11	6 1/2	+ 1/4	+4.0
O	INFORMATION INTL INC	T- 12	7 1/4	0	0.0
O	INFOTON	0- 0	2 1/4	- 1/4	-10.0
O	INTEL CORP	39- 62	46	-2	-4.1
A	LUNDY ELECTRONICS	4- 8	4 5/8	- 1/4	-5.1
O	MSI DATA CORP	10- 19	11 3/8	+ 3/8	+3.4
N	MEMOREX	27- 59	27 7/8	-2 3/4	-8.9
N	MOHAWK DATA SCI	6- 15	7 3/8	- 3/8	-4.8
O	ONEX	2- 6	5 1/2	0	0.0
O	PENRIL CORP	5- 12	9 1/8	- 1/2	-5.1
N	PERTEC CORP	9- 1T	10 3/4	- 3/8	-3.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 5/8	0	0.0
O	RECOGNITION EQUIP	7- 13	7 T/8	- 5/0	-T.3
O	SCAN DATA	1- 5	2	- 1/4	-11.1
N	STORAGE TECHNOLOGY	19- 46	23 5/8	- 3/4	-3.0
O	T BAR INC	11- 20	13 1/2	-1 3/4	-11.4
O	TALLY CORP.	4- 9	6 5/4	+1 3/8	+25.5
A	TEC INC	6- 13	6 1/2	- 1/2	-7.1
N	TEKTRONIX INC	33- 50	42	- 1/2	-1.1
N	TELEX	3- 9	4 5/4	- 3/0	-7.3
O	TESDATA SYSTEMS CP	9- 23	9 3/4	0	0.0
O	WILTEX INC	1- 2	1 1/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1978 RANGE (1)	CLOSE NOV 15 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	8.	- 1/4	-5.0
O	BALTIMORE BUS FORMS	2- 4	1	0	0.0
A	BARRY WRIGHT	14- 50	20	-2	-9.0
O	CYBERNATICS INC	1- 1	5/8	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	15 1/2	+ 1/2	+5.5
N	ENNIS BUS. FORMS	8- 1T	10 7/8	- 5/8	-5.4
N	3M COMPANY	43- 66	58	-1 5/8	-2.7
C	MOORE CORP LTD	26- 34	20 1/2	- 1/2	-1.7
N	NASHUA CORP	18- 5T	22 3/8	- 3/0	-1.6
O	STANDARD REGISTER	20- 2T	21 1/2	+ 1/4	+1.1
A	TAB PRODUCTS CO	8- 16	9 1/2	0	0.0
N	UARCO	19- 40	38 5/8	- 3/8	-0.9
A	WABASH MAGNETICS	10- 22	13 1/2	-1	-6.8
N	WALLACE BUS FORMS	18- 33	21 3/4	-1 1/8	-4.9

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NEWSPAPER

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Persistent Teens Pull Off Coup

By Jeffry Beeler
CW Staff

HAYWARD, Calif. — Overcoming al-ost insurmountable obstacles, two enagers scored a minor mathematical up recently when they found the rgest known prime number with the lp of a mainframe and advisors at Cali-rnia State University here.

Eighteen-year-olds Eaura Nickel and art Noll uncovered the number, ${}^{21,701}-1$, on Oct. 30 following a tempes-ous three-year search that included me 440 hours of computer time on the school's Control Data Corp. Cyber 174.

With their find, Nickel and Noll eclipsed a record set in 1971 when Dr. Bryant Tuckerman of IBM's Yorktown Heights, N.Y., research center found the largest previously known prime number, $2^{19,937}-1$. Tuckerman phoned his congratulations to the pair about three weeks ago after he and mathematician Dr. D.H. Lehmer of the University of California at Berkeley independently confirmed the primality of the Nickel-Noll find.

Throughout their long search for the 6,533-digit number, the two youths battled parental and administrative objections that frequently overshadowed the intellectual challenges of their enterprise. Nickel's parents particularly opposed the project because it forced their daughter — a Hayward High School dropout who has attended Whittier College in southern California — to spend long periods away from home.

"She was a bit wild," confessed Cal State math lecturer Dan Jurca, who aided the pair by providing research material and arranging for them to use the school's

(Continued on Page 6)

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The V-8600 mainframes unveiled by NCR Corp. last week — its largest CPUs yet — feature 64K-bit memory chip technology.

NCR's Biggest CPUs Yet Feature ECL, 64K-Bit Chips

By Howard A. Karten
CW Staff

DAYTON, Ohio — NCR Corp. announced its largest systems ever last week with the introduction of two mainframes featuring emitter-coupled logic (ECL), 64K-bit memory chip technology and gate speeds of 750 picosec.

Apparently aiming to compete with IBM's 3032 and 3033 processors, NCR said it will begin shipping the V-8650 and the V-8670 in the fourth quarter of 1980.

The smaller system, available with memory sizes of 4M, 6M and 8M bytes, gives 10% more throughput than the IBM 3032, according to a spokesman. The larger V-8670, available with 4M, 6M, 8M, 12M or 16M bytes of storage, gives 15% greater performance than the 3033, he said.

However, it is NCR policy to state these figures in terms of power or throughput, and they are not necessarily indicative of the units' speeds, the spokesman pointed out.

NCR claimed several technological advances for the systems in addition to those of circuitry. These include a high-speed cache memory, bus architecture, multiple virtual machine capabilities and a pipeline design.

(Continued on Page 8)

Itel Microcode Lets ECPS Run on 370/145

By Don Leavitt
CW Staff

SAN FRANCISCO — Through a substantial reworking of the microcode used on IBM's original 370/145, Itel Corp. has made the Extended Control-Program Support (ECPS) built into OS/VS1 available to users of that CPU, an Itel spokesman said here last week.

With the change, Model 145 users can gain performance improvements of 12% to 15% compared with operations under unenhanced VS1, he said.

The spokesman said a beta test site that runs its system 24 hours a day, seven days a week — "so they really beat it good and hard" — had seen useful problem program time rise from 60% to 72%. Since the shop normally runs at 100% utilization, the boost in user time had to be a reflection of reduced supervisor time, he asserted.

Introduced by IBM when it announced the 370/148, ECPS has been described as a "hardware assist" since it moves part of VS1 into microcode.

At the ECPS announcement, IBM said the facility could not be made available on the 145 since that CPU did not have enough microcode space or capability, according to Itel.

Currently, however, ECPS is available not only on the 148 but for VS1 users running on the 135-3, the 138 or the 145-3. It may be used if VS1 is running "native" or under the Virtual Machine facility (VM/370), according to an IBM manual.

Itel said it was convinced the support could be adapted to the original 370/145 so it set its engineers to work to determine what ECPS really did and how it could be fit into the space available on the 145.

They succeeded, the spokesman said, and the ECPS facilities can be utilized by any user after a re-gen of the system. The generation parameters have to specify a desire to use ECPS and, at Initial Microcode Program Load (IMPL), the Itel microcode is loaded from a magnetic tape.

While the vendor is ready to distribute the microcode generally on the basis of the single beta test site's experience, the Itel spokesman also said the company is looking for more test sites.

He apparently does not see the offering as a long-term solution to the typical user. Instead, he said it would probably be of the most benefit to "folks with a 145 that is just about out of gas." With Itel's ECPS in place, these users can "limp along for another couple of months."

ECPS provides no functional benefit, he acknowledged, adding that it does not, for example, support any peripherals that aren't available under non-ECPS-supported VS1. But it does provide the performance boost it was designed to give, he reiterated.

The microcode will be generally available after the first of the year. It will cost from $500/mo to $700/mo, depending on the term of the licensing agreement, the spokesman said from One Embarcadero Center, San Francisco, Calif. 94111.

ACS to Relieve Host CPU Of Some Net Tasks: Bell

By Ronald A. Frank
CW Staff

WASHINGTON, D.C. — Future users of AT&T's Advanced Communications Service (ACS) will find that certain functions now performed in host mainframes will be moved into the network.

This was one of the Bell System responses to a series of questions about ACS that had been posed by the Federal Communications Commission (FCC) in an attempt to get more details about the proposed AT&T network offering [CW, July 24].

ACS will allow a "decoupling" of the originating and receiving stations in a message transmission, resulting in independence of terminals and hosts, AT&T said.

"This decoupling reduces the terminal communications support burden experienced by hosts in many user net-

(Continued on Page 4)

A CW Special Report on Data Communications Networks appears after the In Depth section, which follows Page 60.

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Police Comb Through Printouts, Find Car That Hit Fellow Officer

By Tim Scannell
CW Staff

BOSTON — Aided by a Registry of Motor Vehicles computer, police here have located the car that struck and seriously injured Metropolitan District Commission (MDC) patrolman Harold MacGilvray in a recent hit-and-run accident. The vehicle's driver is still unidentified.

MDC detectives discovered the damaged aqua blue 1968 Chevrolet sedan after a massive two-day, round-the-clock investigation by more than 300 MDC patrolmen. MDC police officials combed through stacks of printouts containing approximately 16,000 possibilities that matched the description supplied by MacGilvray's partner, an eyewitness at the scene.

Officials narrowed the list to about 6,000 cars by eliminating various color combinations and separated the remaining printouts according to different geographic areas. More than 300 MDC policemen then worked both on- and off-duty to locate and examine every car on the final list.

The vehicle was found in nearby Weymouth and identified by matching the car's dented right-front side with a 4 in.-long piece of chrome left at the accident's scene and some paint flecks taken from MacGilvray's uniform.

'Matter of Seconds'

MacGilvray was hit exactly two weeks ago as he and his partner were questioning another driver in the breakdown lane of Boston's Southeast Expressway. The unidentified driver of the Chevrolet was allegedly traveling in the same lane at about 60 miles per hour and hit MacGilvray when he swerved to avoid the stopped car.

The force of the impact lifted the patrolman out of his shoes and tossed him more than 25 feet into the air, Henry Scully, MacGilvray's partner, explained. Scully witnessed the incident as he stood on the other side of the stopped automobile. "In a matter of seconds [MacGilvray] was in the air and the car gone," he recalled.

Extensive Surgery

The driver of the stopped car chased the speeding automobile and provided police with a vague description of the car's make and color.

MacGilvray was rushed to the Boston City Hospital for emergency treatment and later transferred to the Boston University Medical Center for extensive surgery.

Doctors toiled for 13 hours reattaching the patrolman's aorta, which had been nearly ripped from his heart, repairing a punctured colon and liver, setting two leg bones and rebuilding the circulatory system in the officer's lower right leg.

Doctors are optimistic about MacGilvray's survival, although his name was still on the hospital's critical list at press time.

Printouts Aid Search

This was the first time the MDC ever performed an investigation of such magnitude, MDC spokesman Frank Muelo said. "We were able to find the car through a lot of legwork and good investigatory techniques," he commented. "But we probably would still be looking door-to-door if we did not have the printouts from the registry."

MDC and other police agencies usually access the Registry of Motor Vehicles Control Data Corp. 3300 system via a computer located at the Massachusetts State Police headquarters. The registry maintains between 3.5 million and 5.5 million "valid" automobile files which are indexed according to the vehicles' identification and registration numbers, according to Robert Capasso, deputy registrar. However, in the MDC's case there was nothing to go on except the class of the vehicle involved in the accident.

Normally this type of search would first have to be cleared through the registry's Special Investigation Section and then the registrar before being submitted to the computer room staff. "But in this particular case, we stopped the shop and put [the request] right through," Capasso noted.

The registry's entire file was matched against the information supplied by MacGilvray's partner and the motorist who gave chase, producing several thousand suspected cars and ultimately leading to the correct vehicle.

Case Not Closed

The investigation, however, is far from over, Muelo observed. Although the owner of the Chevrolet has been identified and a suspect has confessed to driving the car at least two hours before the incident, the guilty driver is presently still at large. "We're not going to rush into it; we're going through it slow and making sure the process is complete," Muelo said.

"When a brother officer is hurt is hurt or something like this happens, everybody pools together," Muelo stressed. "You're fighting the court system; you're fighting a lot of different things as a police officer; you're more or less against the world. So you try to hold each other together."

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Virginia Today Conducting Canvass in Senatorial Race

By Tim Scannell
CW Staff

RICHMOND, VA. — The state Board of Elections here will complete its official statewide canvass of the U.S. Senate election votes today to settle a contest that has been troubled by computer foul-ups and human inaccuracies.

Unofficially, Republican John W. Warner defeated Democrat Andrew P. Miller earlier this month by 5,190 votes in what has been described as the closest general election in recent Virginia history. However, the accuracy of that figure and of the entire 1.2 million vote count was questioned because of the numerous delays and discrepancies which plagued the News Election Service's (NES) computer, used to process the Virginia returns on Nov. 7-8.

The NES computer, located in New York, apparently listed more voting precincts in Virginia than the 1,857 the state actually has. At one point, it failed in the middle of a vote count, according to election officials.

In fact, the NES computer went down intermittently throughout the election night, delaying returns and coverage across the country [CW, Nov. 13].

Richard Eimers, NES executive director, acknowledged that the computer was beset with various problems that night, but said he was unaware of any errors in the results.

In addition, the unofficial figures were clouded by the counting of absentee ballots. Some precincts included those votes with the Election Day results, while others processed and returned them separately, officials said.

Tables Could Turn

Because of the numerous errors and Warner's less than one-third of 1% unofficial victory margin, state election officials have cautioned that Miller could easily emerge as the victor following today's canvass. In last year's gubernatorial election, Gov. John N. Dalton unofficially lost to his opponent by 7,000 votes, but was declared a winner after the election results were officially compiled.

However, an unofficial survey of city and county election results conducted by both the NES and the Associated Press revealed that Warner's margin had actually increased by about 600 votes.

Meanwhile, Miller acknowledged that his rival for the U.S. Senate seat is the race's "apparent" victor and said he believes Warner received "the next higher number of votes." However, "that's no concession," he said.

The election board's official vote total is determined by using two sets of election documents — tally sheets, which are used to record the votes at each of the state's 1,857 precincts, and "abstracts," or the official vote totals compiled by city and county election officials. The state's official canvass is always held on the fourth Monday in November following each election.

Although neither candidate has accused the election board of any irregularities, Miller recently petitioned and received the circuit court's permission to review election documents before today's official canvass.

Mid-Sized CPU Joins NCR's I-8400 Family

By Howard A. Karten
CW Staff

DAYTON, Ohio — NCR Corp. has beefed up its I-8400 family with a medium-sized processor aimed particularly at businesses that need rapid file updating but don't want a superpowered system.

The I-8410 fits midway in power between an NCR I-8250 and an I-8430, a spokesman said. The unit uses the firm's previously announced I-8400 family software and is said to be totally compatible with those offerings. No new software was announced with the I-8410.

Scheduled for initial shipment in the first quarter of 1979, the processor can accommodate 256K- to 1M bytes of memory, in available increments of 256K. The device shares the bus-type architecture of other 8400 series systems and has a 112-nsec cycle time, the spokesman noted.

The system is aimed at small to medium-sized interactive DP users such as wholesale distributors and firms involved with order entry.

The system can also be used for batch and on-line applications through the use of floppy-disk-loaded firmware, the company noted. The firmware is not accessible to users.

In addition to being compatible with 8400 system software, such as NCR's Interactive Resource Executive, the system is said to be compatible with I-8100 and I-8200 software.

No peripherals were announced with the processor. However, NCR said it can accommodate from 81 million to 648 million bytes of disk storage, as well as previously introduced line printers, magnetic tape storage devices and CRTs.

A typical system configuration including 256K bytes of memory, four CRTs, 81 million bytes of disk storage and a 300 line/min printer sells for $105,130 and rents for $2,580/mo on a five-year agreement, the company stated.

ACS to Move Tasks From CPU Into Net

(Continued from Page 1)

work configurations today. As a result, the movement of certain communications functions from user host computers into the ACS network is supported," AT&T said.

Although the exact functions will depend on the user's application, the phone company said it could suggest some functions that might be included. The company mentioned polling, device handling, broadcast mode, authorization procedures, format and validation routines, error recovery and journaling.

Since terminal output and host input "need no longer be coupled," it serves no purpose for the host to furnish polling support. Even in inquiry/response applications, where no time delay is specified, advanced polling of terminals by the network and subsequent polling of the net by the host can generate efficiencies, AT&T wrote.

With ACS hosts and terminals decoupled, it is no longer necessary to have the host provide communications management functions for the terminals. Moving this task into the network allows the host to accommodate a much larger range of terminals.

Since current address lists are maintained within network storage, user CPUs need only generate suitable messages. These are then transmitted to the appropriate devices connected to the net, Bell told the FCC.

A sophisticated authorization arrangement enables a user to define private subnetworks within the shared ACS net. This capability "extends opportunities for intercompany networking," Bell said.

In addition, messages entered into the net at different times can be stored and consolidated into larger messages. This feature can obviate the need for format and validation support at the host, it added.

Error recovery is handled within the network because it is undesirable to burden the user's mainframe with this task, Bell said. In addition, the net will provide the ability to keep abbreviated records of transmitted messages at either transmitting or receiving stations. This journal capability has long been a feature of message-switching systems, AT&T added.

Unsuitable for Data Base

Responding to a query on whether ACS could be used as a data base system, AT&T told the commission that the only way for customers to store data on ACS would be in the form of messages or through customized communications programs. ACS is unsuitable for use as a data base system because "the techniques of data base management are absent from the service," AT&T wrote.

The service will not provide the means for developing relationships between items of data contained in different messages or to retrieve items from messages stored within the network. So while the customer's use of ACS for data base purposes is not precluded as a theoretical matter, "no practical application can be anticipated," Bell said.

Potential Costs

On questions related to potential costs for ACS, AT&T said it was working on a Cost of Records System that will allow costs to be allocated to specific ACS rate elements.

While it listed no specific cost data, Bell did describe the four components that will be used to calculate an ACS user's bill. These include a count of packets or bytes transmitted, the number of Network Resource Units (NRUs) utilized, the kilobytes of network storage used as a function of an as yet unspecified unit of time and the elapsed network time used by the customer.

The NRUs will determine the communications management functions within ACS that have been used. Packets will be counted for calls and bytes will be counted for messages to measure the transport facilities that have been utilized, Bell said.

Within the five basic classes of terminal devices ACS will support, AT&T cited more than 500 models listed in various DP reference publications. It is expected that terminals on the list will be ACS-compatible but this is not a certainty, according to Bell. In addition, other terminals not specifically listed may be ACS-compatible, AT&T said.

Applications that particularly lend themselves to ACS usage, according to Bell, include order entry between manufacturer or distributor and supplier; transmission and control of freight shipment documents between shippers, freight carriers and consignees; reservations processing for travel-related organizations; claims processing between medical centers, doctors offices and health insurance companies; and insurance policy and claims processing.

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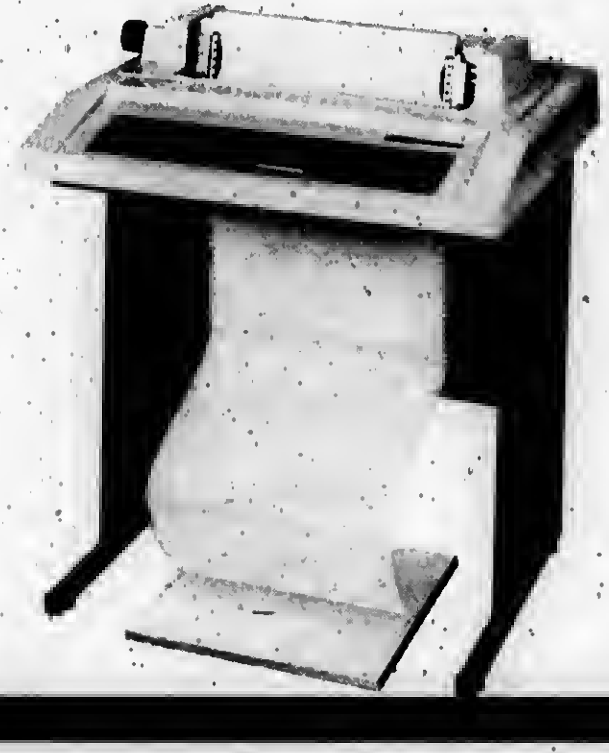

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ACM to Honor Weiss at Confab Next Week

WASHINGTON, D.C. — A series of DP professional awards and a government program featuring speakers from Congress and the executive branch will highlight the annual meeting of the Association for Computing Machinery (ACM) here next week.

The Distinguished Service Award, described as the ACM's chief prize for nontechnical achievement and one in a series of awards for DP excellence, will be presented to Eric A. Weiss of Sun Co.

The Distinguished Service Award will be presented to Weiss on Dec. 4 in recognition of his contribution to ACM and the computing community, particularly in the field of publications and publication policy.

The government program will include speeches by Rep. Jack Brooks (D-Texas), Rep. Charles Rose (D-N.C.) and Paul Bortz, deputy assistant secretary of the National Telecommunications and Information Administration (NTIA).

Other Recipients

Other award recipients will be Robert W. Floyd, a Stanford University professor, who will receive the A.M. Turing Award for technical accomplishment for his work to improve software, and Raymond Kurzweil, who will receive the Grace Murray Hopper Award for his development of a computer system that reads printed pages aloud to the blind.

As part of the government program, Brooks, the sponsor of the primary piece of legislation affecting government computing, will discuss the Brooks Act and its impact on federal DP over the last 10 years. Rose will describe the growing use of computers by Congress and the resulting opportunities for increased efficiency in the legislative branch.

Lester Fettig, administrator for federal procurement policy in the Office of Management and Budget (OMB), will describe the challenges facing the government as the single largest consumer of computer products.

Report on Reorganization

The results of President Carter's effort to reorganize federal DP will be presented by Wayne Granquist, also of OMB.

Addressing an area that is anticipated to have implications for the entire DP field, the NTIA's Bortz will discuss the prospects for a national information policy. Finally, Frank Carr, the commissioner of the General Services Administration (GSA) Automated Data and Telecommunications Service, will describe a number of efforts designed to better manage and coordinate computer and telecommunications policy.

Further information on the conference, which will be held Dec. 4-6 at the Sheraton-Park Hotel, is available from Dennis M. Conti, National Bureau of Standards, Washington, D.C. 20234.

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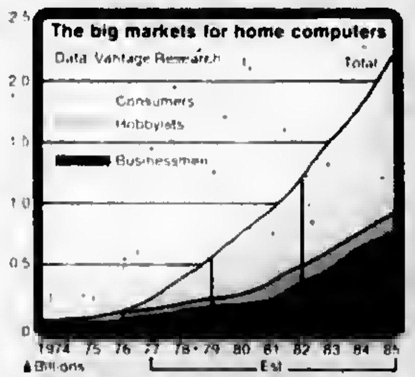

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Grand Jury Indicts Rifkin In $10 Million Theft Scheme

By Tim Scannell
CW Staff

LOS ANGELES — A federal court has indicted Stanley Mark Rifkin on federal charges involving the theft of $10.2 million from the Security Pacific Bank here last month, and the Federal Bureau of Investigation has arrested a local photographer on charges of hiding the alleged swindler in his apartment.

A federal grand jury charged the computer consultant with four counts of wire fraud, smuggling, interstate transportation of stolen property and entering a bank to commit a felony.

Rifkin was arrested earlier this month and charged with using Fedwire, the Federal Reserve's electronic funds tranfer system, to steal several million dollars from the Los Angeles-based bank [CW, Nov. 13]. The funds were transferred via wire to a New York City bank account and subsequently diverted to the Swiss account of Russalmaz, the Soviet government's official diamond broker.

Rikin allegedly purchased more than $8 million worth of polished stones which had an estimated retail value of approximately $13 million on the open market.

Closet Case

Meanwhile, the FBI recently arrested Daniel Wolfson and charged him with harboring and concealing a fugitive after he reportedly tried to prevent agents from arresting Rifkin by hiding the consultant in his closet.

Although more than one newspaper has reported that Rifkin had accomplices during the theft, special agent Roger Young of the FBI's San Diego office said the incident appeared to be a "one-man operation." The transaction with the Soviet firm was a "legitimate deal," Young added, because the company had no way of knowing the money was stolen.

No date has yet been set for Rifkin's trial.

Persistent Teens Compute Largest Prime Number Yet

(Continued from Page 1)

mainframe. "She'd stay out all night and periodically run away from home, and her parents quite rightly objected."

Noll, a Hayward High School senior who is taking an honors calculus course at Cal State, seemed to weather the project with little domestic fuss, Jurca added.

Administrative Opposition

In addition to causing strife at home, the Nickel and Noll undertaking encountered stiff resistance from Cal State administrators, who knew that a hunt for a very large prime number would consume hundreds of hours of expensive computer time.

Opposition to the project proved so great at one point that Jurca doubted the two would ever gain official approval to use the school's computer facilities.

But the youths ignored his dire warnings and persevered with an almost "fanatical" determination, the math lecturer recalled.

Nickel and Noll, who learned the basics of computer programming three years ago at Hayward High School, first became interested in computing very large numbers when they spied a Cal State math department poster showing a huge quantity that had been calculated by one of the nation's top young scientists.

Determined to duplicate the feat, they sought the advice of Jurca and Math Department Chairman Dr. Arthur Simon and in May 1977 began writing the first of five versions of a machine language program intended to find the world's largest prime number.

With Jurca's help, they finally gained access to the Cal State mainframe and on Oct. 11 began their computer search for the astronomical integer. After 44 tests and less than three weeks of hunting, the pair's persistence was at last rewarded.

Correction

General Telephone Co. has been responsible for engineering the home energy monitoring pilot program at the Top of the World School in Laguna Beach, Calif. [CW, Nov. 13]. "Schoolchildren to Monitor Homes' Energy Use" identified Pacific Telephone Co. as the firm involved. In addition, the students live in Laguna Beach, not in Newport Beach.

With Analysis Variance Programs

Disciples of Bacchus Automate Wine Rating

By Ann Dooley
CW Staff

DAVIS, Calif. — What's red or white, makes one "tight" and can now be data processed overnight?

Wine, of course — in an automated wine-rating system at the University of California at Davis.

Yes, Bacchus has traded in his wreath of grape leaves for a DP manual. Wine produced by Davis students is now being rated for quality and taste on a mainframe.

Students in the viticulture (grape production) and oenology (wine-making technology) departments here produce the wines by blending ethyl alcohol, polyphenols and several hundred other compounds. Although they still employ the traditional sniff, sip and taste method to judge the wines, the CPU is used to analyze and mathematically rate the blend of the different compounds in each of the wines.

The automated wine rating, which has been at work for nearly eight years, utilizes analysis variance programs on the university's Burrough Corp. B6500 to judge the chemical content of the wines. The time involved in analyzing wine compounds has been cut drastically; wine making is a long, involved process, so this is a real time-saver, according to Walt Winton, department research associate.

The system compares one wine's taste with another or compares wines which have received different treatments in order to determine which is the best quality. Wine can be changed by so many variables, and sometimes the smallest change can create a significant difference in taste and quality, Winton explained.

Different treatments can be conducted in the vineyard or in the winery, all of which affect the wine. Multiple regression techniques have become essential to predict the resulting product with any amount of accuracy.

The automated system allows students to determine what affect each variable has on the finished product and gives them an idea of what is needed to produce a good wine, Winton said.

In addition to the Burroughs system, a Tektronix, Inc. desktop computer with 32K of memory is used for some of the simpler variance changes.

Wine Goes, Data Stays

Much to any seasoned drinker's dismay, the wine produced by the students is discarded after it has been tasted and analyzed. The wine "goes down the drain" because of state laws and university tradition, according to Winton.

The data from the wine analyses, however, is stored on tape for future study, and 75 different wines are kept in a wine library to see how they age over the years.

While it is difficult to tell how much wine is discarded every quarter, each student is required to produce eight wines. There are more than 155 students in the department, and all must take the course at one time or another.

Many of the California vintners, such as the Gallo and Robert Mondavi vineyards, use an automated system to rate the wines produced, experiment with new breeds and blends or maintain a quality control system.

Another automated wine tester at the university is researcher Ann Noble, who performs sensory evaluations of the wines on the computer. Statistics involved in analyzing wine can be done by hand, but it's just too much trouble; computers are the only way to go, Noble said.

Noble's work involves separating and quantifying the wine. Using this weeding-down process of the finished product, she can split the effluent in order to determine the variables that create the various aromas in the wine.

Working primarily with Cabernet Sauvignon, Noble uses multiple regression tables to determine why something smells like a certain attribute of the wine. The work is purely descriptive analysis, with the computer used as a tool for statistical analysis techniques, she said.

Lightwave Test Set for Atlanta

NEW YORK — The Atlanta area will be the site of the Bell System's first standard lightwave communications system, which will use glass fibers and lasers to carry voice and data among three telephone central offices, AT&T has announced.

The Atlanta system will be placed in service by Southern Bell Telephone and Telegraph Co. in the fall of 1980, according to a spokesman.

In May of this year, AT&T reported the successful one-year trial of a full-service lightwave installation in Chicago. The Chicago test involved a 1.5-mile link under downtown streets between two Illinois Bell Telephone Co. switching offices and between one of those facilities and a downtown Chicago office building.

Other experimental or special application installations of lightwave systems are slated for Connecticut, Florida and Arizona.

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Use of Encryption on Fedwire Under Study

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Federal Reserve Board has undertaken a research and development project to determine the feasibility and cost of using data encryption devices to protect the Federal Reserve System's Fedwire operations.

Fedwire is an electronic funds transfer (EFT) system connecting "Fed" member banks around the country. With about 500 banks currently online, Fedwire last year handled 25 million transfers of funds and government securities representing $43.2 trillion.

Three firms have developed prototype encryption devices for use on the system, and the devices are currently in use in undisclosed locations around the country.

The Fed hopes to finish up this field-testing stage of the project within the next six months, according to Richard P. Anstee, program manager for EFT planning in the Fed's Division of Bank Operations. It is hoped, he said, that the project will provide enough information to judge the benefits and costs of using data encryption with the Fedwire system.

The prototype devices utilize the Data Encryption Standard (DES) developed by IBM and approved for government use two years ago by the National Bureau of Standards (NBS). It was the approval of the DES that prompted the Fed's R&D project, Anstee said.

The availability of DES and the state of current technology suggest encryption could be used on Fedwire much more cheaply than before. In addition, now that there is a public encryption algorithm, the devices will not require a large amount of protection, lightening the administrative burden associated with data encryption, Anstee said.

However, he added, "we felt that we just did not know enough about encryption or what the impact of it would be on our operations" to decide whether to use DES devices on Fedwire when the algorithm was first approved by NBS.

No Decision Yet

The Fed's Committee on Communications, which manages Fedwire, began talks last year with approximately 10 firms about undertaking a joint R&D program that would provide vendors with the opportunity to develop DES-based devices and provide the Fed with the information needed to decide whether to use the devices on Fedwire.

Anstee stressed that the project does not mean the Fed will necessarily use encryption and said there is no overwhelming concern about the security of the Fedwire operations. No encryption is used on Fedwire at this time.

The project was undertaken to allow the Fed "to make an enlightened decision" on whether to use encryption and, of equal importance, to determine the costs of such use, he explained.

The Fed eventually chose three vendors to develop prototype encryption devices for trial use on Fedwire. Anstee would not identify them or specify where their devices are being used, although he did say they are "in actual operational situations as much as possible."

It will be some time before the final decision on Fedwire use of the DES is made, he said, describing the R&D project as "long-term."

NCR Brings Out Its Largest CPUs Yet

(Continued from Page 1)

Although no software was introduced with the systems, the spokesman said an extended version of the company's Virtual Resource Executive (VRX) will be available when deliveries of the system begin.

The bus architecture is 32 bits wide and can transfer data between subsys tems at a rate of 72M byte/sec, the company said. The bus is the link between components of the system and functions as a single high-speed data path, the spokesman explained.

Contributing to the power of the processors are the pipeline design and the microcode, the company indicated. The processor cycles at 28 nsec and uses the pipeline design to execute instructions. This design breaks each instruction into segments, or stages, for concurrent processing.

The microcode, or firmware, is loaded from a flexible disk that can be biased for different applications or languages. This allows the systems to be "conditioned" for specific languages, providing faster compiling and execution than conventional processors which are not language-oriented, the spokesman said.

The power of the processors is further increased through the use of a cache memory, or fast access buffer, which is said to reduce memory access time by a factor of six. The V-8650 supports a 32K-byte cache memory, while the V-8670 supports a 128K byte cache.

The V-8650 uses a single medium-scale processor and the V-8670 uses two such units; these monitor all systems elements continuously. Each processor controls two CRTs that function as either operator consoles or system diagnostic units.

Either of the consoles can perform diagnostics concurrently with normal operations, NCR said.

I/O for the system is accomplished through the use of channel control processors. Two to four of these processors, each controlling up to 32 subchannels, can be attached to either system. Each channel has a 2M byte/sec transfer rate, the company claimed.

Memory cycle time on both systems is 380 nsec, according to the company, and both systems access 1G bytes per cycle.

The family of processors is based on NCR's "Migration Path Engineering," NCR said, which allows for transportation of both systems and application software from the company's smallest systems, the 8000 series and Century systems, to its largest, the V-8600.

Also introduced by the company was a disk drive with a capacity of more than 16 bytes. The Model 6550, said to offer twice the capacity of NCR's previously largest disk, has a transfer rate of 1.2 M byte/sec.

The disk drive costs $69,000 or $1,845/mo on a one-year lease.

A V-8650 with 32K bytes of cache memory and 4M bytes of storage will cost $1,776,500 or rent for $39,200/mo on a five-year rental agreement. That price includes an operator console and two I/O channel control processors capable of serving up to 16 I/O channels.

A V-8670 with 128K bytes of cache memory and 4M bytes of storage costs $2,555,000 or rents for $53,500/mo, also on a five-year arrangement. An additional 4M bytes of memory on what the company called "larger configurations" carry a purchase price of $196,800.

William S. Anderson, chairman of the company, said NCR's "continuing development of advanced large-scale systems means all current users of NCR systems — from terminals to minicomputers to mainframes — are assured the widest range of compatible processing power in the industry."

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Storage Element Goes Down

DP Failure Holds Up Traffic at Three Airports

By Marguerite Zientara
CW Staff

ISLIP, N.Y. — The brief failure of a single computer storage element compounded the usual morning rush hour problems at the Air Route Traffic Control Center (ARTCC) here 12 days ago and resulted in one-hour delays for about 75 airplanes at the three nearby major airports.

The breakdowns, which occurred between 9:02 a.m. and 9:30 a.m. on Nov. 15 affected departures from LaGuardia, Kennedy and Newark airports, with the longest delay — 61 minutes — recorded at LaGuardia, according to Ian Wolf, data systems officer at the ARTCC.

The ARTCC here is one of 26 flight control centers in the country that contol planes between their departure points and their final destinations.

Too Much to Handle

The runway slowdown problems were caused by the ARTCC's inability to accept the normal traffic flow within a certian time frame from the airports involved, according to Peter Nelson, chief of the Common Instrument Flight Rules (IFR) Room at Kennedy Airport.

The Common IFR Room at Kennedy, for example, directs planes from departure to an altitude of about 17,000 feet within a 50-mile radius, then hands them off to the ARTCC, Nelson explained.

"When the ARTCC's computer shuts down, it deprives us and airport control towers of the automated flight data information," Nelson said. "We still had our radar tracking capabilities here, but since our computer couldn't communicate with the ARTCC computer, we couldn't make automatic handoffs and automatically exchange data."

Exchange by Voice Lines

All data then had to be exchanged by telephone voice communications. "We could have continued to operate at very close to normal," Nelson said. "However, they couldn't accept the traffic as fast as we could give it to them, and dissemination of information out there becomes critical" because of safety factors.

The precise cause of the failure is still under investigation because "the hardware fault itself shouldn't have resulted in a significant outage," according to Roland Jenkins, ARTCC sector manager.

Storage element failures are usually backed up by the automatic configuration of a "spare," Jenkins explained. Although the system did configure a spare on Nov. 15, "around that point some other things proceeded from that fault," and those failures are under investigation.

The ARTCC uses a specially configured IBM 360/65 known as the 9020E with four 128K-byte Model 9 storage elements. The 9020E is used to process flight data for air traffic controllers' radarscope displays.

With the computer failure, ARTCC controllers worked from radar and voice contact with pilots for information usually displayed on their screens, such as altitude, speed, airline name and flight number.

No Complaints

Noting that the failure was in no way similar to the recent failure of a 9020E at O'Hare International Airport in Chicago that caused massive air traffic slowdowns throughout the Midwest [CW, Nov. 6], Wolf said the problem had never happened here before.

"You have to understand that hardware fails, and the system is designed to be tolerant of hardware failures. When that occurs, normally there's another piece of equipment that can automatically, under program control, be reconfigured into the system," he continued.

The reconfiguration process causes no interruption in the operation and, "from this standpoint, this was an unusual occurrence," Wolf said, adding the ARTCC has no basic complaints concerning its computer equipment.

Officials stressed that air safety was not jeopardized at any time and that the delays were caused by measures taken to ensure the safe separation of aircraft.

Cybertek Paying Smokers to Quit

LOS ANGELES — After Vaughn Morgan, president of Cybertek Computer Products, Inc., calculated it costs his company $675 pet smoker per year, Cybertek began offering employees $500 to kick the habit.

Morgan estimated the smoking habit consumes about 15 minutes per day, or 3% of the work year. Basing that percentage on the average $22,500 salary paid at his firm, he figured that each employee who smokes costs the company $675 a year.

According to the Cybertek plan, an employee who quits smoking for a year is awarded a $500 bonus. In January, 23 employees applied for the bonus; 13 are still not smoking.

The program is strictly on the honor system, a company official said.

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Batch System Consolidates Patient Blood Data

By Marcy Rosenberg
CW Staff

NEW YORK — A major medical center's blood bank here was suffering from hardening of the DP arteries until the center implemented a computerized reporting system that provides quick access to patient and blood usage information while sharply reducing paperwork.

For years, the blood bank at New York University (NYU) Medical Center relied on two Access Corp. mechanical card retrieval devices to store general patient information — name, blood group and type — and data on problem patients in two separate locations.

Contained in file drawers, these systems were unwieldy and unreliable because of occasional mechanical breakdowns that necessitated time-consuming manual lookups, according to Dr. Harold Kaplan, blood bank director.

Also, a growing volume of activity — about 35,000 blood transfusions last year alone and twice as many related blood sample cross-matches — began to tax the capacity of the access drawers, Kaplan said.

Rather than spend between $5,000 and $10,000 for another Access system, the blood bank turned to the medical center's own IBM 370/138 and developed a cost-effective batch mode reporting system.

Called the Blood Bank Management System (BBMS), the batch system consolidated patient information from the various Access sites into one convenient form, with added capability to generate blood usage and patient file statistics, Kaplan said.

BBMS programs were written in ANS Cobol and run under DOS/VS. All of the blood bank's files are contained on one IBM 3340 disk pack, according to Lyn Kahn, former NYU systems analyst who designed and implemented BBMS. She is now an independent systems development consultant.

The blood bank considered going on-line, she said, but it did not want to change its recordkeeping methods, could not afford to rent an off-site system and had no room to install one in-house. "We didn't have extra personnel to do data entry," Kahn noted, "and while the technologists could have done it, space limitations precluded putting a terminal at every desk."

Designed to Fit

BBMS, on the other hand, was designed to fit the operating procedures already established at the blood bank. Data is key recorded directly from technologists' source documents, thus reducing turnaround time and transcription errors, Kahn explained.

"Originally, we were going to use optical character recognition (OCR) equipment," she said, "but at the time, OCR wasn't sophisticated enough to deal accurately with handwritten data."

Data input to BBMS includes patient blood records, summary medical histories for patients whose cases require additional demographic and historical information and blood salvage ledgers to record blood units that were never transfused.

The system outputs such statistical reports as technologist workload, blood usage by service and type of patient and counts and ratios of specific components and tests.

It also produces a directory on microfiche which is updated weekly and contains demographic and problem data on all patients seen since 1972. This file allows technologists "to verify an active patient's blood group and type against past records," Kahn noted.

In the two years BBMS has been in operation, Kaplan said, it has cut down clerical work, has provided "reliable and timely access to accurate records," and, through consistency editing, has helped to guard against key recorder errors and incompatibilities between blood donor and recipient.

In fact, the system has worked out so well that the blood bank plans to use it for billing by the first or second quarter of 1979. Billing is now done via a "slip batching" procedure which requires that forms travel through three separate departments.

Charges depend on whether a patient was transfused, cross-matched only or had tests done, Kaplan said, "and since this information is part of BBMS patient records anyway, all we would have to do is add on the billing number."

On the whole, Kaplan remarked, BBMS "has made it easy for us to get valuable information in a painless way."

West Coast Meet Set for January By Law Group

LOS ANGELES — The Computer Law Association, an organization of lawyers and law students concerned with the legal aspects of information processing, will hold its third West Coast Conference at the Hyatt House Hotel here Jan. 25. The purpose of the conference will be to update attendees in key areas of computer law, according to a spokesman.

Sessions at the one-day conference will include:

- "Protecting Proprietary Rights in Software and Hardware," dealing with the current status of the law as well as alternative forms of maintaining and asserting rights in computer programs, devices and data.
- "Managing the Disclosure of Data and Data Bases," which will present recent developments in information privacy, trade secret litigation, and freedom of information.
- "Safeguarding Data and Computing Hardware," which will address practical approaches to dealing with computer fraud, unauthorized disclosure of data and threats to physical security.

Registration fee is $30 for association members and $45 for nonmembers.

For further information or advance registration contact Richard L. Bernacchi, Irell & Manella, Suite 900, 1800 Avenue of the Stars, Los Angeles, Calif. 90067.

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Mail Order Firm Asks $1 Million

User Sues DEC for 'Fatally Defective' PDP-11

By Marguerite Zientara
CW Staff

OMAHA, Neb. — Omaha Steaks International has filed a $1 million suit in federal district court here against Digital Equipment Corp. for selling the mail order food marketing firm a "fatally defective" PDP-11/34 system.

The suit, filed in June and amended last month, charges that DEC installed the equipment in July 1977 but failed to make it work for on-line order entry operations until January 1978.

The 6-month delay "postponed our whole Christmas operation, our big crunch," according to Omaha Steaks President Alan D. Simon. "We had to go to a service bureau, which cost us an absolute fortune."

The company couldn't keep up with all its orders without the on-line system and finally fell behind by "about 9,000 orders." When the system did go on-line in January, it failed to operate on more than 20 business days over the next two months, according to Simon.

DEC never gave an acceptable explanation of what was wrong with the machine, he maintained. It first counseled the user to "give it a chance," then blamed the file access system and finally suggested that the problem lay in Omaha Steaks' applications programs, he said.

In Simon's view, however, the system was simply a "lemon." The problem seemed to be in the tape drives, the CPU and the disk drives, he said. "They kept sending guys out here to fix it, but nobody could fix it," he added.

The suit also claims that DEC would neither replace the equipment nor reclaim it and reimburse Omaha Steaks the $193,943:20 it paid for the system.

Improper Environment

A DEC spokesman acknowledged that DEC refused to replace the equipment for Omaha Steaks. "We sold it a system, having first advised it of the kind of environment it was going to have to provide for it. Omaha Steaks' problems stemmed from its failure to have provided the proper kind of environment, primarily in terms of power source," he contended.

The DEC spokesman said there were other things drawing on the line on which the system was running.

According to Simon, however, from July through November 1977, DEC could not get the system running and didn't realize what was wrong with it. "When it asked us to correct an electrical problem [in November], it was corrected within a day," Simon said, but the machine still didn't work after the adjustment.

Addressing the matter of a proper environment, Simon said that after DEC's "site preinspection," Omaha Steak's "did everything [DEC] asked us to do."

Since reliability was the key to the success of the on-line system, "it would have been stupid of us not to do what [DEC] asked."

Need for Reliability

According to the suit, "Omaha Steaks informed DEC that any breakdown in excess of eight hours would cause irreparable harm to its business and otherwise made it expressly known to DEC that . . . there was an absolute necessity for the computer system to be reliable."

The suit defined "reliability" as a system being available "not less than 99% of the time during normal business hours."

The suit maintained that "DEC expressly warranted and guaranteed Omaha Steaks that its computer system had 'proven reliability' in the field and otherwise that it would perform the job . . . intended of it."

Sold to OEM

In March, eight months after having installed the equipment, Omaha Steaks sold the system to an OEM company "for a low price," Simon said. It then used a manual order entry system until last July, when a Qantel Corp. system was installed.

The Qantel system, comparable to DEC's in size and in number of peripherals, ran smoothly right from the beginning, according to Simon. "The only difference between the two systems was that one worked and the other didn't," Simon said.

The DEC system had consisted of a PDP-11/34 with 128K words of memory, nine VT-52 terminals, an LP-11WA 230 line/min printer, two 88M-byte disk drives and a TJE-16 tape drive.

The case is expected to be heard in federal district court here within a year.

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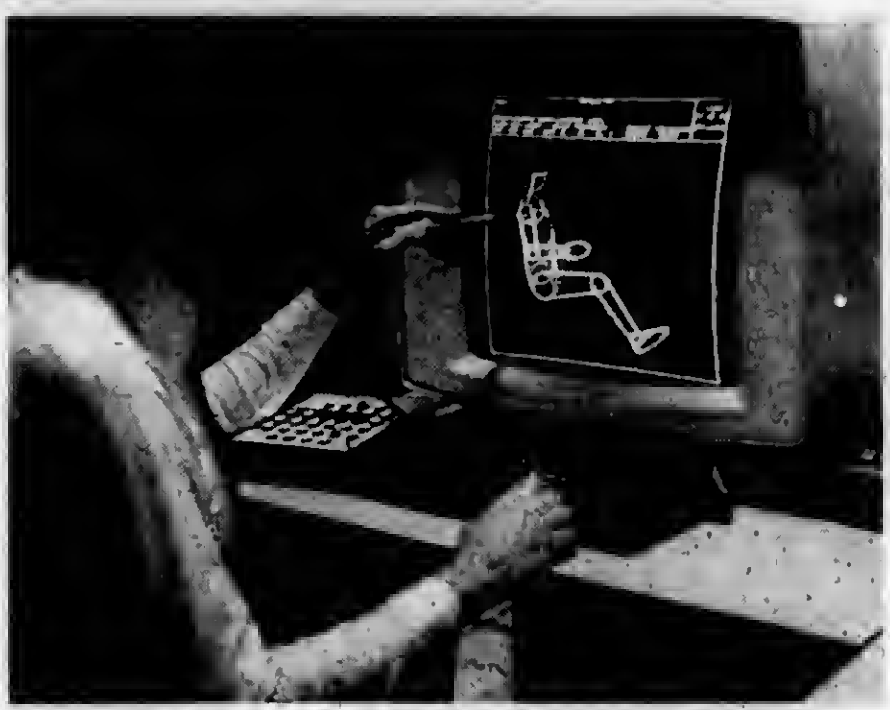
Air Force Tests Workspace With 'Combiman'

By Ann Dooley
CW Staff

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — A computerized biomechanical man-model (Combiman), a three-dimensional mock-up of the human figure, is being used at the Aerospace Medical Research Laboratory (AMRL) here to increase efficiency in workspaces.

Many workspaces, such as airplane cockpits, have precise spatial areas, and the size of the person functioning in that workspace can often be critical to efficient operation. If a person is too tall, short, large or small, he might not be able to function with maximum efficiency because he can't reach a control or doesn't have enough space to move around in, according to Dr. Joe McDaniel, AMRL research and industrial engineer.

AMRL has data on the physical dimensions of nearly 90,000 people in the U.S. and allied countries stored in an IBM 370/155. These representative samples of body measurements are tested by Combiman to determine which physical features would work most efficiently within a given space.



Joe McDaniel uses light pen to reconfigure Combiman model.

Regular Updates

The data bank includes dimensions on people from both the military and the civilian work force and is updated regularly to allow for changing body types.

Although the Aeronautical Systems Division uses Combiman to test cockpit designs, the system can be used for any kind of seated workspace, such as that in an automobile or in a factory assembly line area, McDaniel said. It took several years to develop the system, and Air Force R&D centers are just beginning to use it, McDaniel noted.

To operate Combiman, an engineer or a designer sketches the man-model on an IBM 2250 graphics display using a light pen. For hard-copy results, a Gould, Inc. electrostatic plotter is used to construct the physical characteristics mock-up on a computer printout.

Visualizing Workspaces

The three-dimensional mock-up allows designers to visualize man's interaction with his allotted workspace and how well a certain body type fits into that workspace. In many work areas, there are certain restrictions automatically imposed, such as body or shoulder harnesses or bulky clothing. The man-model can be used to evaluate these added inconveniences, McDaniel noted.

The printouts also show the worker's field of vision from a given workspace, allowing designers to determine whether there are any physical obstructions because of the workers' size. This can be very important, according to McDaniel, who said that some car drivers can barely see over their steering wheels and consequently are not in full control of their autos. Keeping full control is even more important for a pilot, he said.

When determining what body characteristics fit best in a given workspace, an operator calls up a menu of items of body characteristics and uses the light pen to select various options.

The three-dimensional model can add or subtract characteristics and can be redesigned quickly and easily, McDaniel said. Combiman was designed to move in its workplace — its hands and feet move and its body swivels to allow engineers to determine ease of movement.

Construction Stages

The man-model is the product of three stages of construction, beginning with the skeleton. Combiman uses a link system consisting of 33 linear segments that function the same way parts of the human skeleton do, McDaniel said.

The Combiman system then "puts meat on his bones" by fashioning ellipsoids — three-dimensional geometric forms — around the joints of the link system. The size and shape of the ellipsoids are based on a complex combination of body dimensions and mass stored in the system.

Combiman was written in Fortran using IBM graphics and uses 400K bytes of memory, McDaniel noted.

Designers and engineers had previously used manually prepared drawing board constructions, and juggling all 90,000 physical dimension character sets required a great deal of skill. But the computer interface to the data base has greatly improved testing and evaluation times, McDaniel said, and what used to take several months now takes several seconds.

In addition to the time saved, use of Combiman has cut costs. Most manual models had to be altered — and thus redrawn — after the first tests, but now everything is done the first time on the graphics display, he concluded.

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Zilog Manager Optimistic

Micro Field Booming, IBM Witness Testifies

By Connie Winkler
CW Staff

NEW YORK — The microcomputer industry has matured rapidly and is surprisingly sophisticated, easy to enter and booming, according to M. Dean Brown, manager of marketing research for Zilog, Inc. and IBM's 10th witness in the U.S. antitrust case here.

Zilog is one of the firms IBM contends have proliferated and are now vigorously competing with the computer giant.

Brown was on the stand for four days, a time considerably shortened because his direct testimony was in the form of a 27-page written statement. The written narrative technique is being tried to expedite the trial (See story on Page 14).

Zilog of Cupertino, Calif., is capitalized by the Exxon Corp., and in 1975 started selling semiconductor chips, Brown said. It has since graduated to manufacturing boards and microcomputers as well as the Z80 chip. The firm sees itself becoming a complete computer company with $1 million in revenue by 1990, Brown stated.

Super Chip

The Z80 chip, for which Zilog is noted, is an 8-bit, single-chip CPU capable of addressing 64K bytes of memory. That super chip has been incorporated into the MCZ 1/05 microcomputer, two boxes including a Z80 CPU chip and 64K bytes of memory and a floppy disk storage box with 600K bytes of memory, and the MCZ 1/20, a one-box version of the 1/05.

Brown spent his first day in court demonstrating the MCZ 1/05 and 1/20 and five applications: a business management system written in Cobol for a food distributor, a material tracking or inventory control system written in Basic, a bookkeeping system for a gas station, word processing system and an education program for graduate English students.

Brown engaged the whole court in poetry writing with the educational program.

Embryonic Stage

Marketing of the MCZ is in the embryonic stage, Brown said, and only five of the systems have been sold. The price ranges from $6,000 to $18,000.

The systems demonstrated in court included Infoton Corp. CRT terminals and a Diablo Corp. 1620 printer.

The MCZ 1/05 has the programming, I/O capability, instruction set and reliability of the IBM 360/50, Brown said. Early Eniac, Seac, Univac and Maniac machines at the Atomic Energy Commission, where he worked under contract, would take five months to do the processing a Zilog MCZ 1/05 could complete in one week, according to Brown.

On cross-examination, Brown clarified that while the MCZ 1/05 has many of the software capabilities of the 360/50, it has few of the hardware capabilities.

Future of Micros

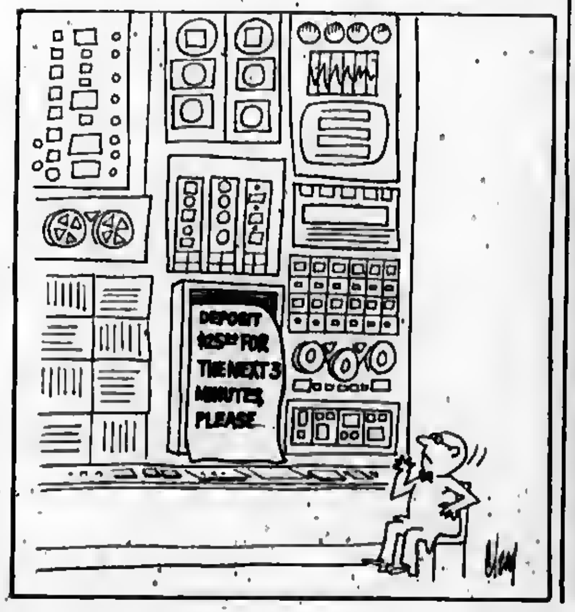
Brown also talked about the future of microcomputers, agreeing with Data General Corp. figures that microcomputers will account for $100 million in sales in 1978 and $300 million in 1980. While general-purpose or megacomputers will experience a 30% growth rate over the next two years, microcomputers will grow by 300%.

Brown, who wrote the software for Zilog's MCZs, testified about the growth of other microcomputer manufacturers in the Santa Clara, Calif., valley and about the offers Zilog had for funding. Brown is also planning his own software firm, Picodyne, to provide applications software to Zilog customers. One prospect he's excited about now is a gasoline station accounting program.

Brown's testimony was followed by a discussion of whether the government would allow IBM to introduce deposition statements from about 640 DP-related firms. IBM is expected to use the total of these firms' revenues to show that it does not have a monopoly share of the DP market.

The government objected that many of the depositions taken in 1974 do not define what is included as DP revenue. It decided, however, to allow the depositions to be presented at this time, but to reserve its motion to strike the depositions at the end of the trial if IBM does not provide adequate foundation for them. IBM says it will do that.

The next witness, Raymond J. Dubrowski, a partner of Price Waterhouse & Co., is providing totals of the DP revenues reported in these depositions.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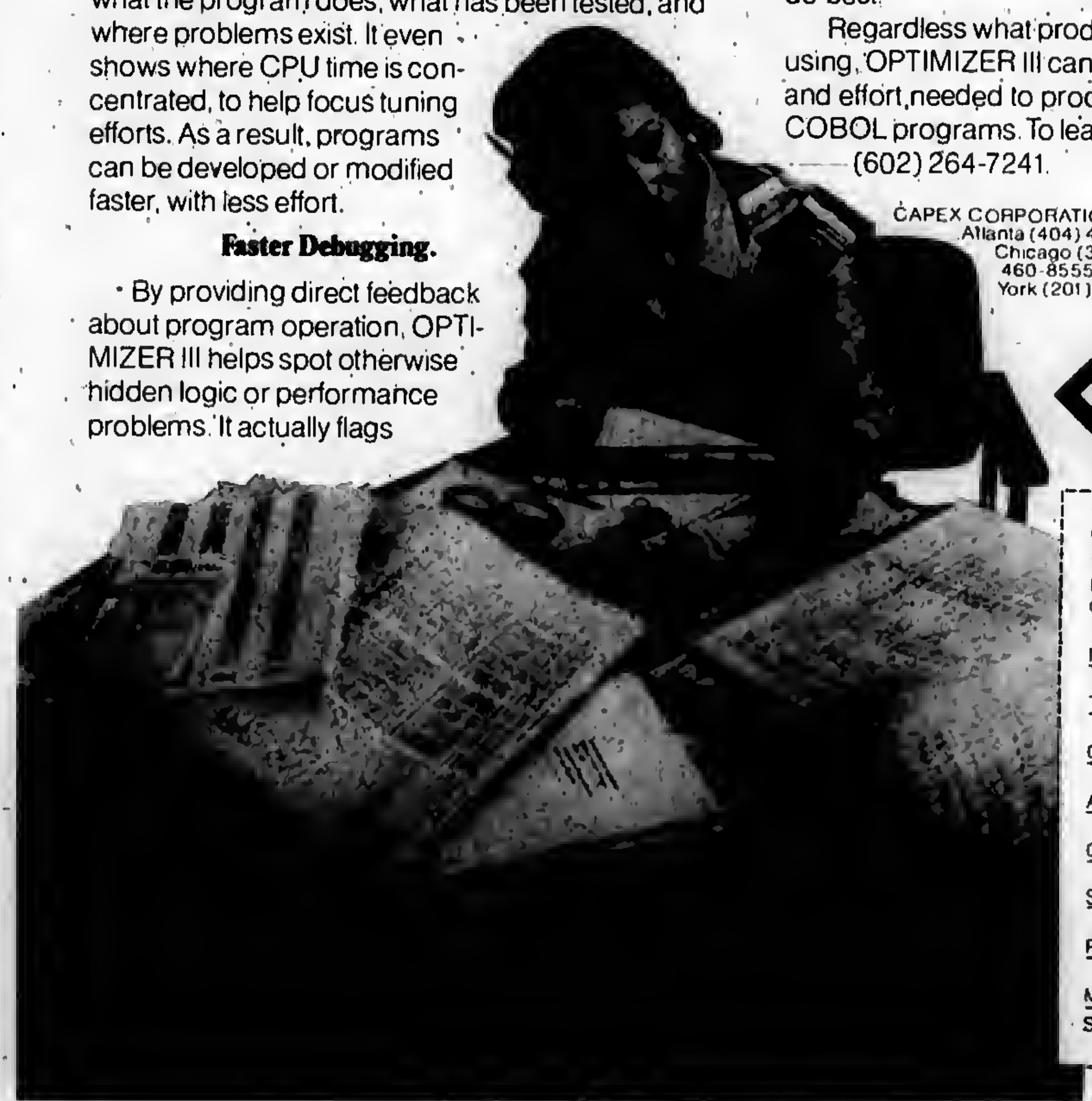

CRTs Feed News on Laws to Multistate Firms

By Marguerite Zientara
CW Staff

COLUMBUS, Ind. — Can't sleep because you're worrying about the status of a state legislative bill that could affect your corporation?

Up-to-the-minute computerized legislative information is now available 24 hours a day in 11 states, thanks to a business centered here.

Legislex, Inc., an "early warning system" aimed primarily at major corporations, keeps terminal-equipped users in 11 states informed on such topics as taxes, the environment, computers and privacy, energy, workplace standards and product safety, according to its politically active founder, Judith Sly Head.

The topics are based on the stated needs of people whose organizations operate in more than one state. "For example, if you are a national company and you have factories in 10 states, you need to know what the different workmen's compensation laws are and what the states' Occupational Safety and Health Administration requirements might be," Head said.

State Versions Differ

In some cases, one set of national laws may have different refinements in the states' versions. This is especially true in the area of environmental issues, Head noted.

"People might be quick to assume — and I think mistakenly — that corporations want to stop the issuance of such laws," she said. "It's much more a case of finding out whether the law is one under which they can operate."

Four years as state president of the League of Women Voters demonstrated to Head that time is a critical factor in monitoring state legislative activity. During her term as president, businesses which were increasingly affected by state legislation asked her for data that was hard to come by.

"We could offer everyone our league state legislative newsletter or refer them to any of thousands of such available newsletters, but state legislation moves fast, and a corporation either had to have a physical presence in the state capital or rely on the numerous mimeographed sources that came through the mail a week late," she said.

After more than a year of researching the need for such a firm and of interviewing software companies, Head organized Legislex in September 1976.

Field Representatives

Legislex presently employs two field representatives in each of 11 state capitals, including New York, California, Illinois, Ohio and Pennsylvania. These representatives monitor selected topics from the time bills are introduced until they receive a gubernatorial signature or veto.

Monitoring a bill includes tracking its committee assignment and the action on it in each house, voting in each house and any action by a joint committee of each house relative to the legislation.

In addition to tracking, Legislex offers its clients a "probability of passage" that changes weekly. The field representatives predict passage possibilities, Head said.

Each night, after the legislative sessions, field representatives record their findings with equipment — supplied by the telephone company — for input the next morning into the Legislex data base in Columbus. Head declined to describe the data collection system, calling it "proprietary information."

The next morning the information is reviewed for "quality control" at the Columbus office and then input through a Texas Instruments, Inc. 742 programmable terminal to an IBM 370/168 computer. Users can access the information at "almost any hour of the day or night" from any interactive time-sharing terminal, Head said.

Since 1978 was a successful "testing year," the system will expand in 1979 to include 47 states, "all the continental states [whose legislatures] will be meeting." The system eventually will include Hawaii and Alaska.

In 1978 the cost to users was $2,000/year, but with the planned expansion, the price will rise to $3,200/year in 1979. Topics covered by the system will also increase as user need becomes evident, Head said.

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System Aids Prosecutors

Developers of Promis Win Rockefeller Award

By Tim Scannell
CW Staff

WASHINGTON, D.C. — Charles Work, a local attorney, and William Hamilton, president of the Institute for Law and Social Research here, were recently named cowinners of the Rockefeller Public Service Award for their development of the Prosecutor's Management Information System (Promis).

The $10,000 tax-free award was established under the sponsorship of the late John D. Rockefeller III and is administered by Princeton University's Woodrow Wilson School of Public and International Affairs.

A committee of representatives from business, education and government selects a number of recipients each year. The decision is based on the committee's evaluation of an individual's past work in the public interest, a spokesman said.

Promis was developed in 1971 and is used by more than 100 courts and judicial systems across the country. The software package is compatible with a variety of hardware configurations and essentially catalogs every bit of information that passes through a state's superior, federal or district courts.

More important, prosecutors can use the system to identify "career criminals" and multiple offenders whose cases may be buried deep within the court's already crowded judicial calendar.

Habitual criminals with cases pending are noted on a separate listing that details their previous arrests and convictions as well as any other charges for which they may be out on bail, probation or parole.

Such defendants "are usually most chagrined when they learn they've been designated as career criminals," Work stated. "They know they're not going to walk the bases and their case is going to get the attention it deserves."

Thus far, 6,500 multiple offenders have been fingered by Promis, and 94.7% of them have been sentenced to an average of more than 15 years apiece.

Study of Judicial Process

The computerized system has also revealed a number of unflattering facts about the American judicial process. Last year, a study of the information gathered from a number of Promis-enhanced court systems showed that between 50% and 77% of all the major felonies committed within the U.S. were dismissed. "They aren't plea-bargained away, they're just washed out," Work claimed.

Witnesses and victims are less apt to testify as time passes, Work said, which means the more time that is wasted waiting for a trial, the smaller the likelihood that an individual will be prosecuted for the offense.

Promis statistics showed that Milwaukee had an average arrest-to-case disposition lag time of 229 days while Detroit's was 224, Los Angeles' 125 and New Orleans' 116.

In addition, the study revealed that of the nearly 100,000 felony arrests made each year in New York City, a little more than 3,000 are prosecuted by a jury trial. The other 97,000 cases are either dismissed, diverted or disposed of through plea bargaining.

"The American public thinks that most cases are disposed of through plea bargaining but that's not true," Work stated. "The way that most cases are disposed of is that the prosecutor just drops them."

The effectiveness of the Promis package recently prompted Law Enforcement Assistance Administration (LEAA) officials to award $60 million in grants to introduce the system in 33 major cities and urban ares in New York, New Jersey and Michigan, Work said.

"This is the first time in the history of the American criminal justice system that there is a data base that can be researched on a cross-city basis," the attorney said, "and startling things are coming out of the research and the data that is bounced between cities."

Hamilton and Work were two of seven individuals selected by the Woodrow Wilson School's committee to receive the Rockefeller Award. Others cited were the Rev. Jesse Jackson, national civil rights leader, for his efforts in Operation Push; Stanley Sporkin, director of the Securities and Exchange Commission's Division of Enforcement, for administering justice and reducing crime; Margaret Snyder for her activities in international cooperation; and Benny Bailey and Warren Stumbo for improving health services and controlling health costs.

The official awards presentation will take place here on Dec. 5.

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EDP professionals have a word for the new Wang VS computer.
"Incredible."
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"Amazing."

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer — the Burroughs B1700 — with card input sequential files and no video displays, we suffered long delays and storage constraints.

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds — all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested — all by only two people — and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user utility software.

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it: Thanks to the programming power of the VS, I actually came up with more.

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."

EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason.

The VS is a remarkably sophisticated, fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment.

The VS provides for distributed data processing, thus avoiding costly consumption of mainframe resources. It's fast, responsive, ease to use and can support up to 2.3 billion bytes of on-line storage. What's more the VS speaks EDP people's language: COBOL, BASIC, RPG II and ASSEMBLER.

We also think you'll appreciate how simple the VS is to operate. In fact, because of its level of sophistication, it can be operated by people with little or no computer-related training or experience.

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Better Communication on Data Flow Urged

CW Washington Bureau

WASHINGTON, D.C. — A recent study by an American Federation of Information Processing Societies (Afips) panel concluded that better communication is needed between U.S. agencies that formulate policies on transborder date flow and U.S. businesses and industry.

The panel recently submitted 12 "Observations on Transborder Data Flow" to the State Department. The observations, which do not constitute an official Afips position statement, included a number of suggestions to assist U.S. policymakers. The panel suggested:

- The first step is to define clearly the problems in transborder data flow. A statement of U.S objectives should then be developed so specific questions can be isolated.
- It is important to separate national concerns for individual privacy and national security from economic concerns on the part of some nations for increasing or decreasing present imbalances in data flows.
- Computer technology itself can solve problems that lend themselves to technical solutions. For example, if there is a fear that access to vital data could be denied when it is processed and stored in transnational systems, local copies of the files could be maintained and an inexpensive, "bare-bones" processing capability could be offered locally to handle at least the most necessary DP tasks.
- The U.S. should seek participation in multilateral agreements.
- Industrialized countries should consult developing nations in drafting regulation agreements. Agreements formulated otherwise are likely to spark "adverse reactions from developing nations and Communist bloc countries."
- An analysis of experiences of international companies with nations that do not want certain data files transferred abroad might be helpful to know which countries "do not want certain data files processed abroad, period."
- One must look beyond the privacy protection issue to weigh the economic and scientific issues and the implications of restrictions on non-electronic information transfer. Transborder data flow issues might cause "significant adverse effects on U.S. industrial growth as a whole."
- The data security technologies of individual countries cannot be depended upon with confidence by other countries "unless the techniques involved are published in open literature so they can be fully analyzed and validated by the countries [and] scientific and technical communities. Then it would be more likely that ensuing legislation would be less restrictive."

Centre Urges Week Honoring UK Informatics

MANCHESTER, England — Charging that "our overseas competitors are building their achievements on our information," National Computing Centre Director David Firnberg recently called for a British National Informatics Week.

Firnberg made his remarks at a recent seminar on "In-House Computer Solutions to Information Handling" presented by the Institute of Information Scientists and the British Computer Society.

Firnberg stressed that "national awareness is needed" of the information society opening up in the UK and in the world.

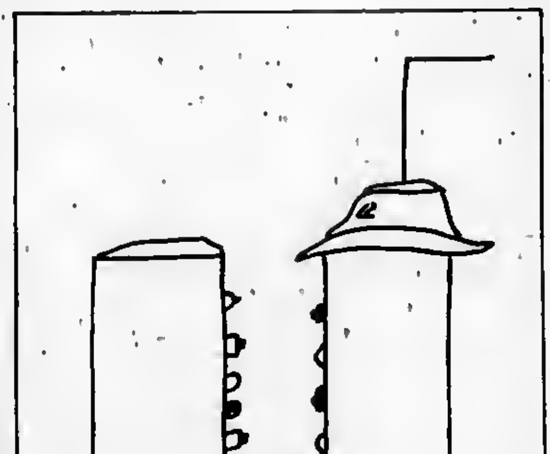
Study on CRT Hazards

The center has also announced a study it will conduct arising from the current interest in possible health hazards associated with the use of CRTs. The study will lead to the publication of recommendations and advice regarding the selection, installation and use of CRT terminals.

In collecting information, the center is seeking case histories of both good and bad experiences from users of CRT equipment. Anyone interested in providing data can contact Paul Wilson, National Computing Centre, Oxford Road, Manchester M1 7ED, England.

In another area, the center recently created a Technical Advisory Committee to advise its director of "significant computing developments and their likely effects" to help him plan future activities.

The committee, which will meet bimonthly, will examine the implications of Viewdata at its next meeting, emphasizing its likely interaction with DP activities.



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Bartering Service Based On Terminals Tied to Mini, Works Like Charge Account

By Marcy Rosenberg
CW Staff

LOS ANGELES — An eye for an eye? Well, not exactly, but the age-old concept of trading is alive and well at a Los Angeles-based company which has come up with a computerized bartering service.

The firm, Mutual Credit, allows its clients to use their memberships like charge accounts to buy and sell each other goods and services with no cash changing hands, according to Thomas Skala, president.

While there are other bartering clubs around, Mutual Credit claims to be the first to tie the concept of bartering with today's credit card system and modern computer technology.

For its own recordkeeping, the firm uses a central processor at its headquarters here to handle inventory control, billing, payroll and accounts payable and receivable. The CPU backs up microcomputers which perform similar accounting functions at each of the firm's 20 branch offices.

The company also provides terminal services to its clients for 24-hour, seven-day-a-week direct communications with its Credit Clearance Department and/or Customer Service Department on a toll-free basis. Members can rent terminals for a $50 installation fee and $10 monthly service charge.

Payment in 'Futures'

Skala outlined how his financial service works. If a lawyer, for example, joins Mutual Credit, he deposits $200 in an account, receives a Mutual Credit Moneycard and is added to the member and service directory that is distributed to all members.

If a member travel agent needing legal services sees the lawyer's name in his directory and decides to use him, the agent would "pay" for, say, a $400 legal fee with his card.

Payment, however, is not in cash, but in "futures," each of which is worth $1. The attorney's account in the main computer is then credited with 400 futures (plus the 200-future deposit) that he can "spend," either for services from a professional or goods from a store.

The travel agent's account is debited 400 futures, meaning he agrees to provide $400 worth of travel services to any other member of the trading pool.

The price of barter services is set by the trader, Skala said. Mutual Credit charges the buyer an 8% service charge for each transaction and the seller 5% to cover bookkeeping and directory publishing costs.

IBM 360 Traded for Mini

Until a year and a half ago, Mutual Credit used an IBM 360/30 "which was set up for batch processing and was shared with another company," Skala noted. "With the IBM system, we had to do credit holds manually and also had to keypunch to get a computer printout which was not up-to-date."

About that time, Mutual Credit was acquired by Sntcor Corp. of Las Vegas, which, through a subsidiary, Sntcor Electronics and Communications, assembles equipment for credit clearance service and electonic funds transfer applications.

Sntcor built a 1.2G-byte minicomputer system for Mutual Credit that "gave us on-line capability and was faster than the 360/30," Skala said.

Called the Sntcor 15, the system uses a CRT terminal for input and output and disk files "so we can add more memory," according to Skala who declined to name the firms that supplied the hardware. Sntcor, he noted, manufactured the printed circuit boards and interconnect equipment.

At all branch offices, Mutual Credit installed 48K-byte Sntcor 10 microcomputers which store the regional customer information needed to perform inventory control and accounting procedures.

If any branch's member list grows to the point that "the application is bigger than the computer's memory capacity," Skala said, "the operator can push a button to tie in his Sntcor 10 to the Sntcor 15 to get additional storage capacity on a time-sharing basis."

In about a month, Mutual Credit plans to upgrade the 15 to allow clients to communicate directly with the computer by push-button telephone. Clients will then be able to dial into the computer through a special toll free number.

Once connected, a member could find out his present balance by keying in the word B-A-L-A-N-C-E and his account number or could locate a member for any service he needed by keying in works like G-A-R-A-G-E B-O-S-T-O-N or H-O-T-E-L- L-A-S-V-E-G-A-S.

The computer will be able to reply in English over the phone to supply the desired information, according to Skala, who declined to give specifics about how the system will be upgraded.

Direct-Line Terminals

Mutual Credit's terminal service uses Sntcor terminals which are direct-line communication devices that resemble push-button telephones, Skala said.

The Sntcor 1 terminal has a button that ties it to the firm's Credit Clearance Department; a Sntcor 2 contains a second button to tie into Customer Service.

Among the other terminals rented to clients is a Sntcor 4 that looks like an electronic calculator with a slot to take not only the Moneycard, but also most major credit cards. The user (or seller) can slide in the potential buyer's card and key in the amount of purchase.

The terminal reads the buyer's account number from a magnetic stripe on the card and, linked to the main computer, can verify the card and display the current balance in about 10 seconds, he noted.

Skala, who works in cooperation with several major credit card companies and banks, said Mutual Credit plans in about 30 days to make the Sntcor 4 and several other terminals available to the general public. Prices will be about $5,000 and monthly rental fees will range from $10 to $50.

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Editorial

The Untapped Resource

The computer field has often been described as young and vibrant with plenty of opportunity for everyone; yet it seems plagued with some of the same sex discrimination problems common in other fields.

This "represents a severe loss of scientific talent," as Joan Callanan, manager of the National Science Foundation's (NSF) Women in Science Program, has pointed out [CW, Nov. 20].

Men outnumber women by more than four to one in upper echelon DP jobs (systems analyst or above), according to recent surveys, and the percentage of women receiving degrees in the computer sciences is even lower.

Sex discrimination is, of course, not a new phenomenon but its presence is more surprising in the computer field than in more tradition-bound areas of society.

After all, many of the pioneers and real leaders in the computer profession have been women — Grace Murray Hopper and Jean Sammett come readily to mind.

But perhaps the opportunities for women were better when the field was brand new and little understood by most people, and as it became an established discipline, it became more like society at large, adopting the discriminatory hiring and promotion practices of American business.

This type of discrimination is not only illegal now, it is just plain stupid.

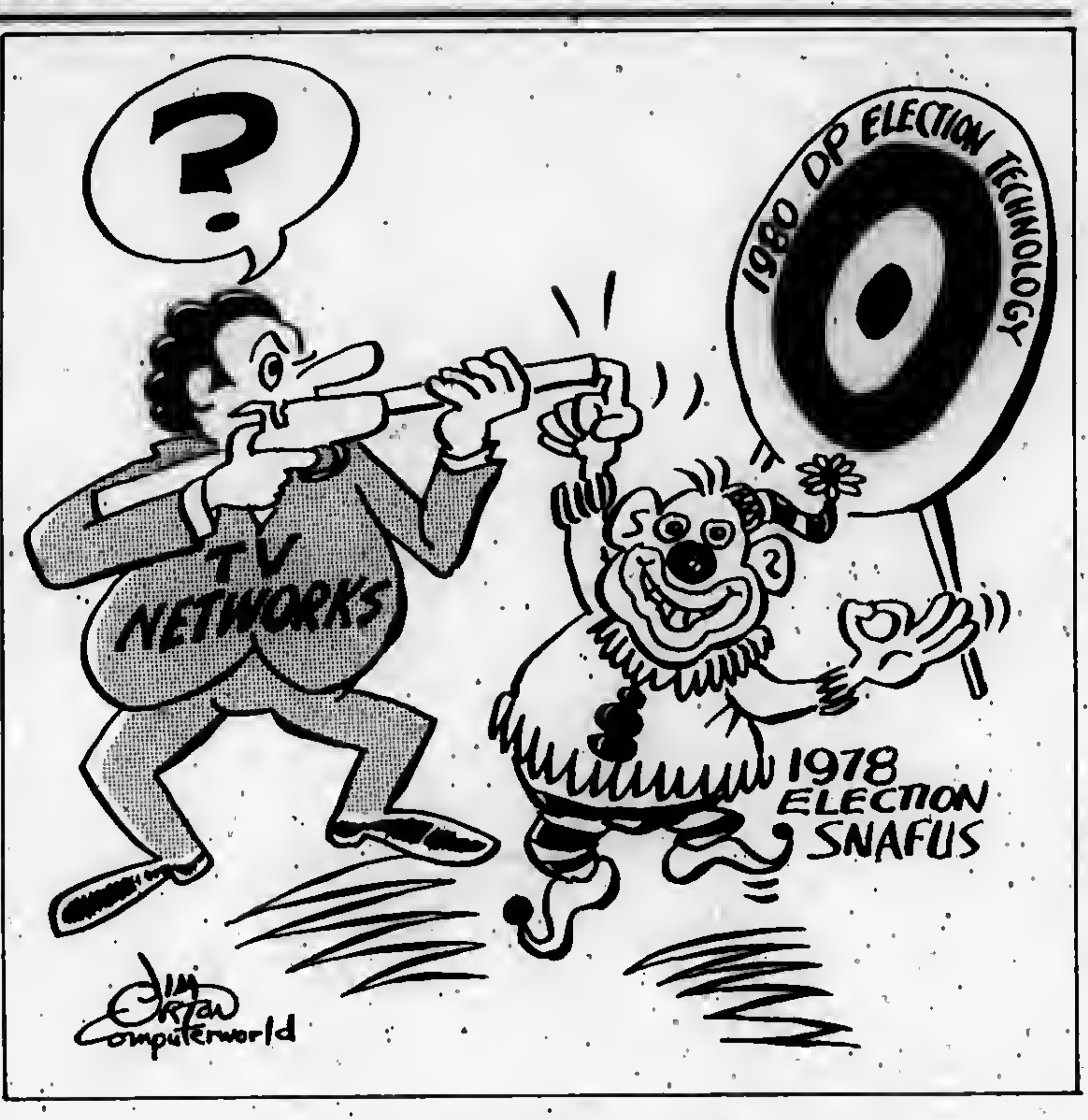
Data processing departments only hurt their overall effectiveness when they discriminate against anyone for any reason. Ignoring talent or relegating it to the backwater of the department hurts the entire operation. In this business, perhaps as in no other, talent should be the only criterion for promotion and success.

As a first step toward clearing up the problem, companies and DP departments within companies should evaluate their own procedures for hiring and promotion and eliminate any built-in biases.

Another way to help increase the pool of talented women would be to support the NSF's Women in Science Program, which sponsors workshops around the country to provide career information for women and advice on preparation for jobs in specific fields.

In the past, these workshops have featured women panelists and participants from industry and government, Callanan said, and she urges companies wishing to participate to contact her.

If DPers get involved in such efforts, we may be able to attract more women to our field — and DP needs all the talent it can muster.



Data Past

Five Years Ago
Nov. 28, 1973

WASHINGTON, D.C. — With the unanimous vote of the Federal Communications Commission, Packet Communications, Inc. (PCI) gained approval to become the first company to provide packet-switched services to users.

— — —

LOS ANGELES — IBM countersued California Computer Products, Inc., charging that the firm had monopolized the market for digital plotters and had therefore kept IBM from entering that market.

The suit came in a week of hectic legal activity by the IBM legal team, in which it dealt with all of the members of the plug-compatible peripherals market presently suing IBM.

Eight Years Ago
Dec. 2, 1970

DETROIT — After two trouble-filled elections, the city's Common Council voted to "dump" the use of punch cards and ordered the city's attorneys to bring suit in the amount of $1 million against Datamedia Computer Services, Inc., the Dallas-based firm that had brought punch-card voting to Detroit.

— — —

WASHINGTON, D.C. — A spokesman for the Internal Revenue Service (IRS) announced that the IRS, upon request, would compute the tax of any taxpayer who earned less than $20,000 and took the standard deductions on the 1040 form. The aim, the service said, was to reduce the errors officials found on 3.6 million of the 78 million returns filed for 1969 income.

Letters to the Editor

Ability Not Guaranteed

In his letter in *Computerworld* [Oct. 30], Ben E. Olive, associate general counsel for NCR Corp., stated that NCR customers' "ability to resell equipment is not dependent on NCR's goodwill but is guaranteed."

Perhaps he can explain how this is true when NCR attempted to establish a maintenance policy last year which stated: "It is our policy, therefore, that Field Engineering Division will not service products or equipment sold or leased by organizations other than NCR unless a corporate contractual business relationship exists between NCR and the third party. This policy pertains to products which may be similar to or exactly the same as that marketed directly by NCR sales representatives."

DP equipment without maintenance is worthless. NCR could be the only beneficiary of such a policy. Fortunately, NCR users were informed of this attempt and raised such a furor that NCR backpedaled through two more versions to the present watered-down version of the maintenance policy.

Even this latest version issued in October of last year provides no guarantee that users may sell their NCR equipment and have NCR maintenance continued.

I am sure NCR users would like to see the guarantee that Olive alluded to. So far, they have only seen attempts to guarantee that only NCR would be capable of selling used NCR equipment.

G. Cimo
Costa Mesa, Calif.

Surprised at Report

I was surprised to read "Don't Be Lulled Into False Security by Minis" [CW, Oct. 23]. Daniel C. Zatyko of Basic/Four Corp. was quoted as saying that we have replaced a large mainframe computer with three minicomputers and that we use a service bureau, none of which is true.

The University of Alabama Hospitals has an IBM 370/148 with an IBM Series/1 minicomputer attached. We have not downgraded our system nor do we plan to do so.

Mary Nell Spraberry
Assistant Administrator
Health Data Systems
University of Alabama Hospitals
Birmingham, Ala.

Zatyko responded that during his presentation at the Fifth International Information Management Exposition and Conference he was referring to an article published in *The Office* **in September, 1978 about the University of Alabama. At the same time, he neglected to remove one of the slides he was showing which described a general solution to a hospital system. Inadvertently the two subjects became overlapped.**

According to Zatyko, the University of Alabama Hospitals has two Basic/Four Model 400 computers which communicate with an IBM 360/65 at the Computer Service Corp. in Birmingham.

The two Basic/Four systems, Zatyko said, are installed in the Department of Medicine and the Department of Obstetrics and Gynecology. Ed.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

The Human Connection

AT&T Putting Energy Into Marketing Plan

By Jack Stone
Special to CW

Seeing John deButts meander down that hallway on national TV sparked my interest in what AT&T was up to. Then the ads for the Dimension line of electronic PBX "systems" extended my curiosity. But it was the article in the September issue of Fortune magazine ("Selling at AT&T Is No Longer Mickey Mouse") that encouraged me to develop this column about the significance of AT&T's changing marketing strategy.

In a nutshell, the article said that legal and regulatory decisions during the last decade have given rise to considerable competition for the grande dame. As a result, Ma Bell has come out of the closet with a fighting posture, telling the industry and the marketplace that she will be, in fact, responsive to customer needs and that AT&T will, in the words of Chairman deButts, become "a marketing organization."

I don't know how you look at it, but to me, when a huge company — about four times the size of IBM in terms of assets and employees, with a technical competence which supports, only as one example, a communications network of upwards of 150 million terminals (the U.S. telephone system) — says, in effect, that past marketing efforts have been fun and games and that now it's going to take it seriously, well, watch out!

It simply has to happen that Bell's actions will create colossal changes in the marketplace as its new marketing philosophy takes hold.

I had the opportunity to interview Philip F. Pagano, a marketing manager at the AT&T "1776" facility in Morristown, N.J., who is responsible for implementing one of the many programs that constitute the redirected Bell System marketing thrust.

Q: What is the central theme of your company's recent marketing pronouncements?

A: It is simply said in our new slogan, "The System is the Solution." Underlying this statement are Bell System action programs designed to replace its old image as a supplier of communications equipment and services with one that is much more appropriate: a supplier of systems solutions for the communications problems of business, government and residence customers.

Major changes are taking place in all departments, including engineering, operations and maintenance, to help ensure a coordinated, corporatewide response to customer requirements.

Specifically, AT&T has just announced a major corporate reorganization that represents a radical shift away from its traditional alignments of 60 years. Now we are structured into three segments: business, residence and network services. Each segment brings together into one self-contained unit, for the first time, all the people and functions needed to properly serve its customer set.

Q: What is specifically happening in the marketing arena?

A: The corporation began studying the marketing organization nearly five years ago when it was determined a new approach was needed in the long term if we were to meet the growing and complex communications requirements of our customers.

A major milestone was reached last year, when AT&T released a set of guidelines, termed the "Bell Marketing System," for streamlining marketing operations for business customers.

This system emphasizes industry specialization of the marketing force. It recommends team marketing, in which the account executive receives strong support from technical specialists permanently assigned to the field marketing organization.

It brings our marketing operations up to date by addressing such matters as revenue planning and commitment, account planning and implementation and the measurement and control of marketing operations.

Q: What is your particular area of responsibility?

A: My group has the task of developing the "delivery system," a comprehensive set of plans and programs whose objective is to assure the marketing success of major new products and services.

We work closely with our associated companies and AT&T departments to make certain new offerings are announced and supported in a highly professional manner.

In many ways, the delivery system helps prepare the sales team to function as a true communications problem-solving operation.

Q: How would you characterize the progress the Bell System has made toward its new marketing goals?

A: Well, for a company the size of ours, I feel we've made great progress in the past several years. But with the recently announced reorganization, I believe our marketing effectiveness will rapidly accelerate.

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

The Taylor Report

Managers Must Delegate Security-Related Tasks

By Alan Taylor
Special to CW

At this month's New England Internal Auditors' EDP Clinic, one auditor asked me what to do when management ignores or brushes off repeated reports of an unprotected computer site.

The security question has two sides, the obvious and the historical. A computer site that allows uncontrolled access is an obvious risk, and auditors are supposed to report such risks to management.

But after the report arrives on the manager's desk, few auditors can point to a prior case in which ignored risks resulted in a major loss. Historically, from management's viewpoint, DP audit literature is full of cries of "Wolf!"

Most computer sites I see are unprotected in any formal sense, and a DP auditor would regard security as inadequate.

Whose Responsibility?

What is really at issue here is not that the site is unprotected but that when the auditor points out to management that protection is needed, he gets a lot of flak. In essence, the DP department is saying, "This is none of our concern."

It is generally believed that the function of the DP director is to get the job done with the resources and facilities supplied to him. It is not the director's job to change sprinkler systems, for example; this is often the responsibility of the landlord's building maintenance department.

"I was hired to get the reports out and see that new systems are implemented," is the routine and understandable director's comment. But such a response is no help to the DP auditor.

One way to deal with such a brush-off is to track back in history to discover just who put the computer room over a fire hazard — like the cafeteria kitchen — without a sprinkler system. Perhaps the computer room opens onto a stairwell that people can enter without being challenged; who planned it that way?

From experience, I would say that approach rarely works. The building maintenance department will say the computer people agreed; the computer people will insist it was the only place where they could get in the equipment and that no one told them a kitchen was going to be put in under the tape units.

Any auditor who willingly

(Continued on Page 22)

Reader Commentary

Executives Taking Stock Of Future DP Situation

By Phillip G. Elam
Special to CW

Virtually no one could foresee the impact commercial data processing would have on the American business community when it made its debut some 25 years ago. While the past is not that important to us, it is important to review the last two or three years and then take a look toward the future.

In 1976, revenue from computer manufacturing and services was $38.4 billion. That accounted for more than 3.2% of the gross national product. Experts are now predicting $64 billion in revenues by 1981, and 1985 will bring revenue levels to 8.3% of the gross national product.

Probably the most alarming factor in these rising costs is related to the people cost of technology. Some 10 years ago the average cost per line of program code was $6 to $7. Many organizations are now citing costs as high as $71 for the same line of code.

Budgetary analysis say that 10 years ago, DP costs were limited to 1% to 3% of the overall corporate budget. Costs have now risen to between 12% and 15% in many organizations. Hence, upper echelon executives are taking a much more active interest in what their respective organizations are getting for their DP dollar.

One industry expert has evaluated the cost of data processing in an effort to determine where organizational money is really being spent. His findings were startling in that up to 70% of the average DP budget is directed toward people costs in some organizations.

And the end is not in sight. If this trend continues, people costs could go as high as 90% of the overall DP budget by 1985, making DP the world's most labor-intensive industry, with the possible exception of agriculture.

But hardware costs are expanding too. True, the cost of computing (i.e., problem-solving potential) may be decreasing on a per instruction cost, but the actual amount of money spent is increasing. In fact, of the $38.4 billion spent on DP in 1976, some $20 billion was spent on hardware and related hardware vendor services.

Another factor that has contributed to higher DP costs is the computing technologist. Very few other professionals have had their salaries triple or quadruple since the late '50s. It is frighten-

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Executives Taking Stock Of Coming DP Situation

(Continued from Page 19)

ing for organizations to realize that for the last decade, these high-priced personnel have (in all too many cases) done nothing more than participate in upgrades and conversions in a never-ending attempt to keep pace with expanding hardware technology.

And according to studies released by the federal government, the demand for these personnel will skyrocket by 1985.

Where does that leave the corporate executive? How can he hedge against these inevitable inflationary trends?

One alternative relates to a new level of technology in the software area which can turn the need from expensive and time-consuming programmer training to the training of users at an intelligent terminal.

This will have two effects on an organization. First, the end user will no longer need to rely on DP personnel to program routine information requests. And second, the computing technologist will be freed to handle the organization's more complex information needs.

Obviously, this will require a completely diverse approach to most commercial software package offerings now on the market.

And that brings us to the executive's second alternative: acquiring external software.

Most Important

Decisions related to software acquisition will probably become the most important made by a corporate executive. In fact, it is paramount that the executive initiate a strategy to increase programmer productivity and provide a more effective price/performance ratio. This is highlighted by the fact that most organizations have already established a comprehensive corporate repository of data, whether in the form of a commercial data base package or some other approach.

And technology is demanding that the next moves be in areas relating to telecommunications, minicomputers and distributed processing. Hence, the critical path for DP in the next decade has already been established.

Both hardware manufacturers and independent software vendors realize this. In 1976, about 10% of DP expenditures were for software. Many industry analysts indicate an annual increase in the acquisition of software packages in the range of 28% each year for the next five years. And this revenue opportunity is prompting software producers to ensure that their products add value to computer hardware and communications resources to serve the needs of the end user.

Software solutions for the future must address the total information system problems of the entire organization, not just isolated areas. Data processors must be relieved of mundane, redundant technical support activities and permitted to become effective organizational problem solvers.

And future software must also include those tools that make it easy for the corporate and user to satisfy information requests and solve the many daily problems organizations face.

Most important, however, executives will no longer have to deal with raw data — they will have meaningful information at their fingertips and can therefore make intelligent, informed command-level decisions critical to the organization's survival.

Information as Resource

Unfortunately, there is no single source for software comprehensive enough to satisfy all of an organization's information needs. And, quite probably, there never will be. But virtually every supplier of software products is busily engaged in defining and building tools to satisfy the next level of computing technology.

But more important than any level of technology is that organizations will begin treating information as a resource. The same level of management attention will go into controlling, protecting and using information in much the same way as any other perishable asset.

Many corporate executives with insight into tomorrow's computing problems (and opportunities) have already realized that sizable investments will be made in the area of software. And for that reason, they have directed their legal and financial staffs to investigate such areas as product deductibility and costs available for investment tax credits.

To date, most research has been inconclusive, since the federal government prefers to treat software investments as tangible property, while most states and local government agencies treat software as intangible.

But fortunately, organizations are outgrowing the mystique of the computer. They are moving from data processing to information processing. Actually, we have an information resource economy today. Industries are spending a total of $40 billion on computing each year. When we add telecommunications, the cost is more than $60 billion.

And if we add the costs of office personnel and equipment, the real users and support for information resources, the costs soars to more than $150 billion. But even that is small in comparison to the staggering $500 billion that is spent each year in this country on information resources in total.

The challenge, therefore, is to increase planning at all levels, to anticipate changes brought about by the future, to consider rethinking traditional organizational structures, to unify all operations dealing with information resources and to focus on the controls needed to manage the tremendous levels of information that will be required to run organizations and institutions in the future.

Elam is manager of communications support services at Cincom Systems, Inc., Cincinnati, Ohio.

Letters to the Editor

Article Missed Points Made in AUUA Keynote

In the coverage of my Americas Univac Users Association (AUUA) keynote address ["Lecht Predicts 10-Fold Price/Performance Gain" (CW, Nov. 6)], several points were stripped of their qualifying commentary and could be subject to misinterpretation.

First, while I did say a 10-fold price/performance gain seemed to suggest the upper limit of large-scale uniprocessor technology expectations, the emphasis of my speech was on the fact that *an upper limit was being encountered* rather than on the 10-fold price/-performance gain. I said it was hard to imagine uniprocessor technology exceeding 10 Mips as currently packaged and with current materials, for example, with circuit heat packaging limitations.

Even if it were possible, long before we could expect to see such processors in the general-purpose marketplace, the cost of achieving such price/performance ratios would be too high.

Any uniprocessor operating even in the low-double digit Mips ranges could be expected to fulfill specialized scientific needs, and probably will not be seen in the commercial arena as a general-purpose commercial machine until Josephson Junction technology is perfected in the late 1980s.

Second, I did predict that the minicomputer business did not have a bright future, but the context in which I made it is extremely important to its meaning. The 1980s will see a time when people can obtain computer power in essentially any amount they want delivered by public or private utilities.

Since this continuum of power is anticipated to cover all ranges of today's systems and more, there will be no reason why we should continue to distinguish the minicomputer business as a unique product category. The classic boundaries of micro, mini, midi and maxi mainframes are blurring so swiftly that modern systems like IBM's System/38 defy such categorizations.

With nearly the power of an IBM 370/158 on a single board, one would be hard pressed to label it a mini notwithstanding its mini range price. Thus, my remark was made to point out that yesterday's minicomputer business definitions which related price to word size, physical hardware size, memory size — even Kips — are rapidly fading.

When reporting on today's swiftly changing computer industry, newspersons must suffer the same semantic difficulties as users do in understanding its products.

Charles P. Lecht
New York, N.Y.

More on Transpositions

Robert B. Higgins' recent rebuttal [CW, Nov. 6], to my article, "Locating 'Transposition Errors'" [CW, Oct. 9], certainly presented some worthwhile concepts and well thought-out extensions to my original presentation.

I hadn't specified that a "divisible-by-nine" condition could be caused by other than a single adjacent transposition because I assumed — perhaps incorrectly — that it was obvious.

Higgins was quite right that the Cobol example as provided was not correct. The "S" in the picture of REMOVE-DETAIL-SIGN was an unfortunate typographical error. I had hoped the name of the field would allow readers to figure this one out for themselves.

One thing I still don't understand is Higgins' statement: "The code, however, carefully counts from left to right. . ." The code is actually counting nothing but the number of divides required to isolate the mantissa. I think a little desk checking will verify that it is correct.

My original intent of presenting a new idea has been satisfied. However, readers who are interested in implementing this idea would be well-advised to carefully read Higgins' presentation.

Irwin F. Kraus
Kansas City, Mo.

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Letters to the Editor

Column on Banking Woes Rings Bell With Reader

I feel obliged to respond to "Banks Using DP to Avoid Facing Customers" by Kenniston Lord [CW, Oct. 23].

First, with respect to the Baybank/Newton-Waltham, in six years of banking there (it is one of two banks I now use) I have had zero problems. However, we as a family had excellent rapport with overworked Bob Hart, the Sudbury, Mass., branch manager who was the "real person" between us and the computer.

Second, the prize I have framed is a check from an Arizona Bank for $49.10 as payment for expenses I incurred as a result of the bank's not following its own policy. My daughter had a checking account there while working on a college work-study assignment. At the termination of the assignment, my daughter and another student were to go to Mexico City and received a check for expenses from the college (Antioch).

The bank refused to accept it until it "cleared," which would not be until three days after they had to depart. We were called and sent a cashier's check from Newton-Waltham to the Arizona bank, which the bank again refused to accept.

I billed the bank for the cost of the phone calls, the exta expenses we incurred and the extra expenses my daughter incurred informing the bank that I had no intention of paying for the bank's protection when it had a clear and valid credit check on my daughter when she opened the account, and that data was in its computer records. I happened to have consulted for several West Coast banks and knew the internal policy of this bank.

And third, the worst foul-up involved American Express (would someone like to write a set of American Express horror stories?). I lost my card. The company gave me a new card number by phone (it took five weeks to get the real card).

I was in the midst of arranging a complex trip through its travel subsidiary. It refused to accept the new number.

Then when I used the new card for the first time entertaining some Swedish government guests at the lounge at Logan Airport in Boston, the new card was siezed because it was on the "missing list" and the lost one was OK. Very embarrassing. I didn't even get a "sorry."

Finally, *Computerworld*: I moved in June. New address sent in a month ahead. No CW. Four tries later I wrote to the president. I think the mail service found it difficult to find (no address) HARBOR HARBOR Washington, 98335. There are only about 40 harbors in 98335 and several hundred around Puget Sound.

William B. Helgeson
Gig Harbor, Wash.

Chamberlain's Affiliation

I enjoyed reading the recent articles by Robert Chamberlain on data base administration and a functional business definition for distributed processing [CW, Sept. 25, Oct. 23]. However, it should have been mentioned that Chamberlain is national manager of technical support for these areas and part of Coopers & Lybrand's National Management Consulting Services.

Walter J. Dick
Partner
Coopers & Lybrand
New York, N.Y.

Jobs Must Be Assigned

(Continued from Page 19)

plunges into such a morass needs his head examined. It is not an auditor's job to find out what went wrong, simply what is wrong. And what is wrong here is no one is accepting responsibility for the security question.

Job Descriptions

The real problem may be that management has not clearly delegated the task of keeping the computer site secure.

An auditor should not attack, even by implication, the performance of the DP department until it is made clear who has what responsibilities. This information should be in the *job descriptions.*

When that disgruntled auditor asked me at the November meeting what he should do about the management brush-off, I should have told him to check the job descriptions. If he found that management had failed to fully define responsibilities, he should have reported it.

The auditor's report should point out the danger of not clearly allocating the responsibility for physical security. Often the duties of a DP director appointed to run a site that has already been put into operation are especially vague.

Next year, if that problem has not yet been corrected, the auditor can use a different example; who has the responsihility for checking that a backup facility can really take over if the central system is down?

Try checking job descriptions. You may find that using this approach you can accomplish more.

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DALLAS — Planning, scheduling and controlling the efficient use of resources is an understandably challenging task at the corporate computer center of Zale Corp. The nationwide retailer in such diverse fields as drugs, shoes, jewelry and sporting goods has assigned to its data center the responsibility for payroll, inventory control, automated warehousing, on-line credit and automated inventory adjustment for some 1,700 units nationwide — in addition to the usual business accounting tasks.

The center receives input from subcenters in New York and San Antonio, Texas, as well as from point-of-sale terminals in the stores. With an IBM System 7, the center queries stores nationwide each evening to adjust inventory automatically on the basis of the day's transactions.

But "the center's main systems are an IBM 370/158 and a 370/145, and they are working four shifts, six days a week, staffed with 140 people," according to John Granger, systems resource analyst. "It is a continuing responsibility to devise more efficient and economical ways of using these resources of people, machines and time.

"There was a feeling here that the growth of capacity was getting out of control, that we were using up our computer resources and the only way out seemed to be a costly 'more,' which was not economically acceptable. We looked for a better way."

That "better way" was found with the installation of a Data Center Scheduling System from Value Computing, Inc. which, Granger said, "gives us tight control of our CPU devices, enables us to put a clamp on the upward spiral of costs and move jobs in and out faster than we could before."

Input to the scheduling system is the logged accounting data from the operating systems. This data is captured automatically and saved on these files.

The system builds job and step profiles from this data and employs techniques to purify the production statistics from testing, Abends and reruns. Exponential smoothing techniques are used to keep wide deviation of runtimes, for example, from distorting the data.

"Schedules are produced on week-ends for the following five work days," Granger reported. "With VCI's Valu-Gen system, report sheets are produced which give a breakdown for each of the five days according to the person who is to run the individual jobs. These individuals make whatever changes are necessary and, on a day-by-day basis, return the

(Continued on Page 24)

'Liber 8' Manages Distribution Of Technical Manuals, Documents

GREAT NECK, N.Y. — Developed to help IBM-oriented programming staffs keep track of their technical libraries, the Liber 8 package from Labyrinth Systems Ltd. is said to automate the recordkeeping and cross-referencing needed to eliminate unnecessary duplication of manuals and newsletters while making sure that needed literature gets to where it is needed.

Frequently the problem with manuals is not their scarcity but their overabundance — especially when bulk shipments of updates are received at a central site under a subscription service — with no clear knowledge of who needs them, where and why, a Labyrinth spokesman said.

The package provides the technical librarian with the facilities to build a data base, identifying exactly who has what manuals and which are on subscription service. From this base, the librarian can extract a list, and mailing labels if desired, for the appropriate recipients as soon as a shipment of manuals or newsletters is received.

The system is also capable of producing lists showing where various manuals are currently being distributed. This facility could be very useful for those times when disk drives, for example, are being installed and the documentation for the old peripherals has to be replaced as well, the spokesman suggested.

The initial creation of the data base is probably the toughest part of using Liber 8, he said, noting that most installations have been "rather casual" about where incoming manuals go and how many are actually needed or being used.

Once that is done, the file maintenance is built into the system. The librarian simply indicates that a given manual has been received; the software updates the intended recipients' records and produces mailing labels with as complete an address as is in the data base for each recipient.

The package functions under DOS/VS and will "run like crazy" if given a 132K-byte virtual partition, though it can be used in as little as 102K bytes, according to Labyrinth.

The software costs $1,500 and can be ordered from 17 Barstow Road, Great Neck, N.Y. 11022.

'MSI' Protects Shared DASD Files

NAPLES, Fla. — The Multiple Systems Integrity (MSI) package from Allen Services Corp. is said to guarantee file integrity across IBM systems accessing shared direct access storage devices (DASD) while operating under any of IBM's OS or OS/VS environments.

MSI is not a security package, a spokesman emphasized. Rather, it solves data integrity problems caused by simultaneous access of the same data by more than one system, and it improves overall system performance by allowing more flexible scheduling and by eliminating many prolonged DASD reserves, he said.

The hazards of simultaneous updating by operating systems in a single-system environment have been recognized. But internally enqueuing the name of each active data set under the SSDSN major name — the usual protection mechanism — does not span intersystem activity, and it is very easy for users in different systems to concurrently modify the same data set, the spokesman asserted.

'Unified System'

MSI relieves users, programmers and operations personnel of trying to cope with the problem. Instead, it returns the means of handling the problem to the operating system by propagating internal control information from each system to all others that share common DASD.

This "unified-system" approach to integrity can be utilized with "any number of associated systems" and applied to all aspects of the user's operations "including, of course, both batch and [Time Sharing Option] TSO," he continued.

MSI avoids the locking out, or reserving, of an entire DASD volume, which is normally used to protect one data set while it is being updated, by allowing installation-specified classes of RESERVEs to be internally and transparently converted to MSI-type ENQUEUES known to all associated systems.

MSI Basic, which does not include the RESERVE activity alternative, is available for $10,000 or $750/mo for the first CPU and half those costs again for each additional system.

The same pattern applies for the full MSI package. Thus, although its base cost is $20,000 or $1,500/mo; the effective cost for a two-system installation is $30,000 or $2,250/mo, the vendor said from 2902 14th St. N., Naples, Fla. 33940.

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CP-77 Extends Vortex II, Boosts Univac's V77 Mini

IRVINE, Calif. — A general-purpose multiterminal time-sharing system called CP-77 has been announced by Univac for use with its V77 series minicomputers. The software is said to be a compatible extension of the Vortex II operating system.

CP-77 operates with or without Vtam communication access facilities and provides a basis for operation of small to midsize multiterminal systems, according to a Univac spokesman.

The time-sharing system supports the entering and editing of program source code, the submission of job-streams to the background job queue and the execution and debugging of tasks directly from the terminal, the spokesman noted. In addition, CP-77 serves as a development system for programs designed to run under Univac's Pronto transaction processor.

Other facilities available to the CP-77 user include support for a "virtual printer"; program output and alphanumeric file contents can be directed by the terminal user to an output spooling device.

Developed by the Laboratory for Advanced Methods in Biological Data Acquisition at Brown University, CP-77 is said to maintain a unique terminal-oriented file system and to provide each user with four logical units which can be assigned to system peripherals.

The system provides the terminal user with the means to perform simple calculations as well as the ability to send simple messages to other user terminals or to the system operator's console, the spokesman continued.

CP-77 maintains user identifications and passwords required for terminal access but also provides terminal users with the ability to access information about system status and the condition of background input queues, he said.

Distributed on 7- or 9-track magnetic tape, the time-sharing software will run on any Vortex II-configured V77 (or V70 with extended instruction set), 96K bytes of main memory, adequate disk space, a tape unit and teletypewriter-compatible terminals.

CP-77 costs $1,500, according to Univac's Minicomputer Operations based here in Irvine, Calif.

Scheduler Aids Retail Chain

(Continued from Page 23)

sheets to the scheduler, which then produces a complete detailed schedule for that night. If a job is not on the schedule, it is not run."

An "actual vs. schedule" report is produced, to close the gap between what was planned and what was actually run. The system also enables people to see from the schedule sheets the jobs for which they are responsible. A job profile for the shift eliminates uncertainties and enables the person to focus on the work that lies ahead.

"Job profiles began changing after we used the scheduling system for a while," Granger concluded. "People found that, with this kind of knowledge, better utilization of capacity could be gained.

"As a result, jobs are now getting in and out faster. And we have the kind of long-range foresight that is critical for future resources planning."

'Bomp' Ready for PDP-11

SKOKIE, Ill. — Manufacturers are now exploding data up to 40 levels on Digital Equipment Corp. PDP-11s through the use of a bill-of-materials processor (Bomp), according to its vendor, J. Baker & Associates, Inc.

The package is a series of 40 Dibol programs that provide output reports ranging from item lists and a single-level bill of materials to an assembly cost buildup report and any of eight types of master file lists, a spokesman said.

Full stock status reports with reorder points and economical order quantities, manufacturing and assembly shortage lists and lists of purchase parts shortages with automatic generation of purchase orders, as well as a top-level production schedule are also output, he said.

Reporting can be controlled on a detail, summary or exception basis. The full product cost reporting can be at any level such as component or operation, subassembly or manufacturing department. Variance analysis is available for current pricing, the spokesman added.

The system can handle multiple companies or locations. There is a "completely unrestricted" bill-of-materials definition, he added.

Running under either RSTS/E or CSC/300 on a CPU with as little as 48K main memory, Baker's Bomp costs $8,800, Baker noted from 5135 W. Golf Road, Skokie, Ill. 60076.

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Patrick J. McGovern
Chairman, International Data Group, and Publisher, Computerworld, Computer Business News
"User Expectations for Systems in the 1980's." Drawing on the attendee survey, this study will forecast user expectations in terms of product performance, software, communications and support.

John Bock
Vice President, Systems Development, Itel Corp. Data Products Group
"Plug-Compatible Systems: Alternatives in the 1980's." Can the plug-compatible survive and grow in the '80's? What new PCM strategies and products can be expected?

Victor D. Poor
Senior Vice President, Research and Development, Datapoint Corporation
"Distributed Systems Architecture and Processors." Distributed functions, control, processing, databases: what are the present and future economic trade-offs?

Dr. J. Egil Jullussen
Senior Member, Technical Staff, Texas Instruments Corporation Engineering Staff
"Semi-Conductor Technology: Driving Force for Computer Systems." Can current computer architecture/designs effectively utilize 64K storage chips, bubbles, CCDs, fiber optic cables, etc.?

Dr. Eugene I. Lowenthal
Vice President, Advanced Product Planning, MRI Systems Corporation
"Database-Centered Architecture and Processors." The back-end file processor's impact on the user and vendor; strengths/weaknesses of the database-processor approach.

Asa W. Lanum
Director, Product Software Development, Amdahl Corporation
"User Opportunities to Improve Software Investment Pay-Off." Can new software be combined with old to produce more effective end-user operation? How does hardware enhance or stifle the potential?

C. Oakley Mertz,
Vice President, Research, International Data Corporation
"The User Customer Base and Systems Migration Dynamics; Impact of Distributed Processing." IDC's migration study — how fast are users moving to newer systems, networks (SNA/SDLC) and distributed processing? What is the likely impact on computer usage in the 1980's?

James E. Thornton
President, Network Systems Corporation
"New Alternatives in Systems Architecture." Will conversion/migration between non-compatible systems be easier by 1982/83? More or less costly? And what innovative architecture choices are open to users now?

James McGuire
President, Computer Division, National CSS
"Computer Services, User Hardware Hybrid Systems." Why are the service companies now supplying their own hardware? What's next?

Dr. James W. Jewett
Vanderbilt University, and President, Telco Research Group
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Additional speakers to be announced.

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'Arsap' Checks PDP-11s

HYATTSVILLE, Md. — Installations running Digital Equipment Corp. PDP-11s under RSX-11M can monitor system usage, measure system performance and bill for resources used with Arsap, the RSX-11M system accounting and chargeback system from Gejac, Inc., according to a spokesman.

Arsap logs statistics that reflect the resources consumed by individual users of the system. Data collected includes terminal connect time, number of: log-ons and log-offs, disk storage utilization, number of I/O requests, CPU execution time and memory demand, the spokesman said.

The statistics are periodically presented to the user in a series of reports.

These reports include both a summary of resources used and a detailed listing of resources consumed by each user, a terminal connect time profile in histogram format and detailed reports at the user's terminals at the end of each session showing the resources used.

Chargeback reports produced by Arsap include a financial summary which shows the accumulated charges and documents the billing rates and algorithm. In addition, numbered user invoices, sorted by user name, show both use and cost information, the spokesman said.

The package costs $1,995 and can be ordered from Gejac at 3322 Stanford St., Hyattsville, Md. 20783.

'SAS,' 'Tell-A-Graf' Tie Adds Graphics to Analysis

WASHINGTON, D.C. — By interfacing two commercially available packages, technicians at Applied Urbanetics, Inc. (AUI) have made camera-ready graphics available as a by-product of statistical analysis operations on IBM 360, 370 and compatible systems.

A spokesman at AUI explained that although the users there liked the facilities of the Statistical Analysis System (SAS) from the SAS Institute — especially its data base management capabilities — they also wanted high-quality graphics to include in their litigation and policy research projects.

To meet that need, the authors of SAS developed an interface between their package and Tell-A-Graf, available from Issco.

Tell-A-Graf is a graphics software system that allows users to make high-quality charts and other graphs on "any computer graphics hardware" using English language commands, the AUI spokesman explained. Without SAS, however, Tell-A-Graf was limited because it had no inherent data management or statistics capabilities, he contended.

The linkage, now available from AUI, allows analysts to perform statistical analyses of their data and then produce charts to highlight their conclusions.

The SAS/Tell-A-Graf combination has been used to drive large drum plotters such as those produced by California Computer Products, Inc. and Zeta, Inc.; flatbed plotters produced by Hewlett-Packard Co. and Tektronix, Inc.; and CRT units such as those from Chromatix to have "soft-copy" color displays, he said.

The combination software (SAS, Tell-A-Graf and linkage) is available for $23,000 from AUI, 1701 K St. N.W., Washington, D.C. 20006.

'Sysmon' Update Aids MVS Usage

INDIANAPOLIS — Half a dozen enhancements have been built into Version 2 of Sysmon IV, making the update an even more powerful on-line systems monitor for IBM OS/MVS shops than the original package, according to the vendor, Performance Systems.

Sysmon IV is said to support uniprocessor, multiprocessor and attached processor configurations without any system modification through the use of "simplistic" control parameters for the performance displays. The package is RMF-compatible and supports both Time Sharing Option (TSO) operations and the system operator's console, a spokesman claimed.

The displays include such things as processor and channel utilization percents; demand paging, page faults, total system paging and swapping; unreferenced page interval counts; length of queues for I/O devices; and performance group and domain service levels and transaction rates, he continued.

Version 2 includes exception reporting on direct access and tape devices. These pinpoint enqueue bottlenecks, reserve lockouts, mounts pending and device drop ready.

An address space summary for TSO, batch, mounted and started tasks is a feature of Version 2, as is a report that shows specific system loading reportable to TSO, IMS, CICS, on-line and a range of other applications selected by the user as critical to his operation.

A display of start/stop times to allow multiple CPU coordination also shows selected time interval reporting, he said.

Version 2 costs $289/quarter year per CPU, with a 50% surcharge for each additional CPU at the same site. Performance Systems can be reached through P.O. Box 44143, Indianapolis, Ind. 46204.

Host Organization and Registration Information

IITI The International Information Technology Institute, the program manager, is a non-profit organization chartered to provide professional development and educational support to information systems executives. It draws on the skills and experience of highly qualified consultants, users, vendors, and university researchers to address key issues in information systems planning, applications, computing economics and technology assessment. IITI programs emphasize practical presentations by skilled speakers, as well as audience involvement in pre-conference studies and issue definition.

ACT Advanced Computer Techniques Corporation is an international firm that provides management, product planning, and product implementation services in a wide variety of areas within the information systems industry. These services include: facilities management, feasibility studies, problem analyses, systems analysis, office automation, service bureau operations; programming project management and systems application software development.

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Bollinger Claims Blasted As Nearly Irresponsible

By Stephen L. Robinson
Special to CW

Data Base Corner

The comments by Norman Bollinger ["Shop Can Save by Writing Its Own Data Base Package (CW, Sept. 25)] border on the irresponsible. Bollinger not only advocates building one's own data base package, he states it is cheaper than purchasing a vendor's product, implies the whole process is quite simple and claims the result will be "superior to the vendor's."

Presumably the acquisition of Bollinger's $35 guide makes the process still simpler and the result even more superior.

Let's address the issues one at a time; first, consider the matter of cost. Bollinger has badly misinterpreted a true statement about commercially produced software — that 15% of a package's cost goes for development and maintenance, 85% for marketing and support.

This is true, but *not* for the first copy sold, nor the 10th, nor the 20th. Rather it is true after the package has "turned the corner" financially. That is, after sales of $1 million, a development cost of $200,000 would be balanced by marketing costs of $800,000.

Development Cost

The cost of developing a *good* data base package is not "far less than $20,000" as Bollinger stated, but considerably closer to $500,000. A stripped-down system with very little capability will likely require at least two man-years of effort, not to mention the requisite computer time.

Such a stripped-down system would probably not have such properties as multithreading, extensive security provisions, generalized interfaces to facilitate access by query languages and report writers or data base administration tools. It would also probably lack reliable backup and recovery procedures which synchronize recovery with multiple batch and on-line users.

The list could be extended, but I believe the point has been made.

What Does One Get?

This leads us to the second area of contention; namely, what does one get for "far less than $20,000"?

It should be noted that $20,000 probably pays for about four months of a good system programmer's time (assume a good person earns a salary of $30,000, benefits, overhead and so forth add up to an equivalent sum). This does not include any computer time, although perhaps by following Bollinger's guide, we can write error-free code the first time through.

It is suggested we should get program-independent data. To me this implies some form of subschema or user view facility.

Bollinger proposes to do this by loading the code and the data definitions at runtime. Fine, but the code to handle true user views is quite tricky, and the necessary mechanisms to prevent resource interlock are even more difficult.

If all that is being proposed is a simple mask for records, it can be done without too much trouble, but the end product is hardly anyting to write home about.

Next we have Bollinger's second component, I/O. No argument here; except if one wants to consider the relative inefficiency of Cobol I/O. However, since the whole package is to be written in Cobol, it would seem that efficiency is clearly not a concern here.

Funniest of All

Fnally we come to the most hilarious of observations, file and record relationships: "This is a logical problem which, if well-defined, will be easy to handle."

I don't care whether Bollinger elects

(Continued on Page 30)

Freight Bill-Paying Service Adds Support in Midwest

LEXINGTON, Mass. — The Freight Audit Computerized Traffic Statistics (Facts) service, already available to shippers through Traffic Data Systems, Inc. (TDS) here and in Pasadena, Calif., is now being offered by TDS-Midwest, Inc. in Oak Brook, Ill. as well, according to a TDS spokesman.

Under Facts, TDS can either pay a shippper's bills or monitor the bills as they are paid by the shipper's bank. In either case, the bills are sent to the TDS office, where they are put through a detailed manual audit against the carrier's filed tariffs, the spokesman said.

This audit may pinpoint over- or undercharges, duplicate billings or other errors that a completely automated review could overlook, he said. After the audit, the bills are keyed into TDS' mainframe — a Honeywell, Inc. 60/62 — for processing.

The processing produces edit lists and generates management reports in addition to checks to the carriers if the client has contracted for the payment option.

The reports provide analyses of the company's overall shipping patterns, the spokesman noted.

Facts reports trends on such key items as vendor, customer, carrier, product line, transportation mode and frequency of movement.

The manual audits and the data entry are done in the local TDS offices, after which the magnetic tapes are shipped here for processing. This provides both personal contact and the economies of centralized DP, the spokesman said.

Basic Facts service — bill auditing, five basic reports and payments if desired — costs approximatley 60 cent/-bill submitted, and the company suggests that shippers with 500 to 1,000 bills a month are large enough to benefit from the service.

The corporation is headquartered at 1050 Waltham St., Lexington, Mass. 02173.

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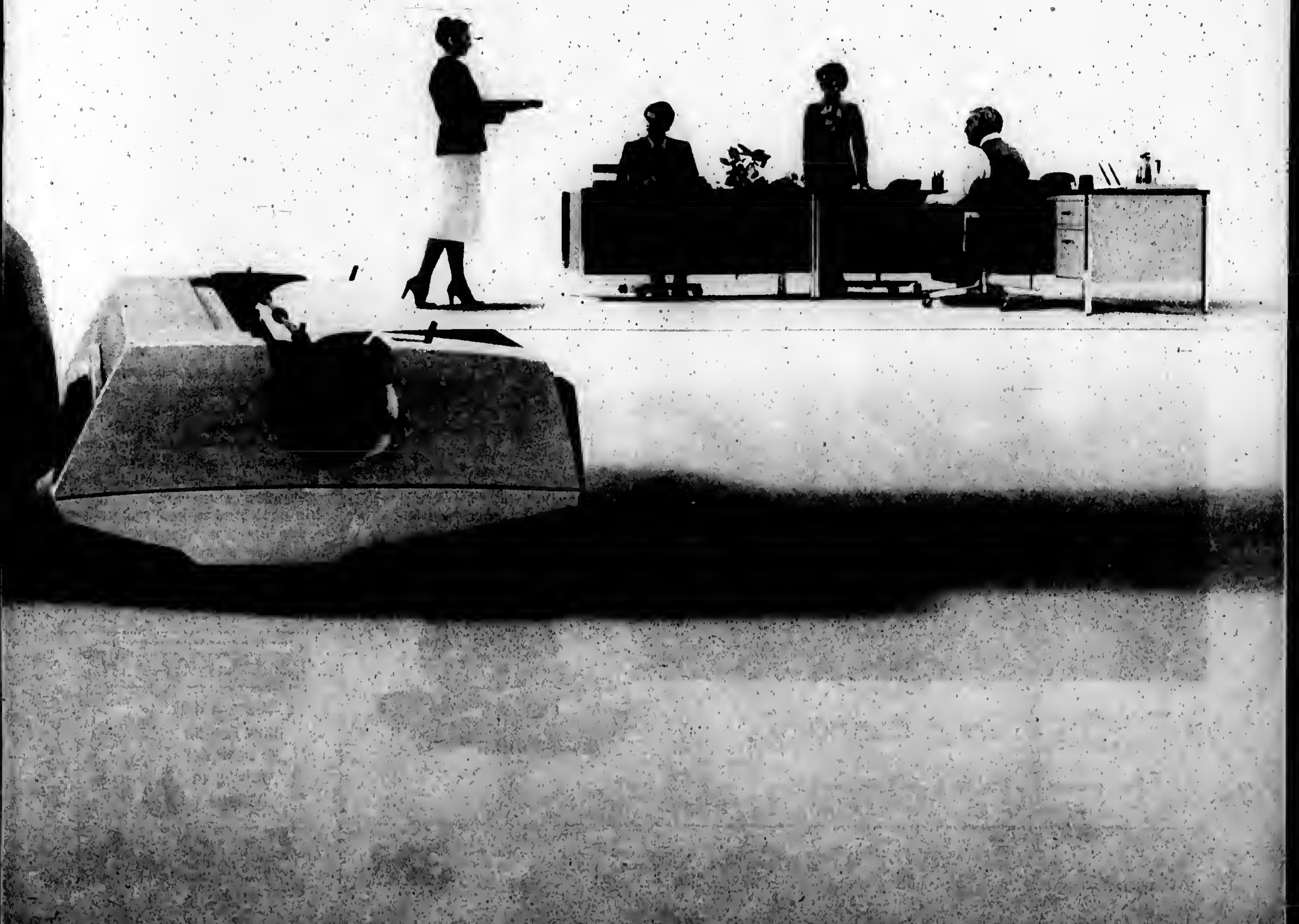

Structured Forum Hits Road

NEW YORK – The Structured Forum, a one-day review of various structured design and development methodologies, begins an 18-city tour with sessions this week in New York, Boston, Toronto and Detroit.

The New York meeting is tomorrow and stops in the other cities will follow as the week progresses, according to a spokesman for co-sponsors Structured Methods, Inc. and Edutronics/McGraw-Hill.

Subjects to be covered at each stop will include the Warnier/Orr methodology for the construction of logical programs, the Jackson design methodology, Constantine/Myers/-Yourdon concepts, basics of data base design and human resource development in a DP environment, the spokesman added.

Chicago, Minneapolis, Seattle, San Francisco and Los Angeles are on the schedule for Dec. 4-8, while Denver, Kansas City, Dallas, Houston and St. Louis make up the itinerary for the week after that.

Early in the week before Christmas, the forum will be presented in Atlanta; Columbus, Ohio; Washington, D.C.; and Philadelphia.

Individual registration is $175, but group discounts are available. All attendees will receive a $100 credit toward services from Structured Methods or Edutronics or books from McGraw-Hill.

More information is available from Structured Methods, 133 E. 58th St., New York, N.Y. 10022.

'BDRaid' Backs IMS, CICS; Includes Three Programs

NEW YORK – BDRaid, an IMS utility package from BDR, Inc., consists of three basic programs: the Data Base Access Facility (DBAF), a Logical/ Compare Utility (LCP) and an unload-reload utility (DBRfresh).

DBAF is described as a generalized utility which provides access to IBM's IMS and CICS data bases and segments. Through a command language, data base segments can be printed and modified as required, a spokesman said.

The use of external tables to drive DBAF eliminates the need for changes in the program each time a different structure is encountered or when changes are made to the data base design, he explained.

LCP is a Cobol program with an internal sort that sequences and compares data sets created by DBAF. By processing DBAF against data bases before and after executing an updating program, two data sets are created containing "before" and "after" images of the data base.

BDRfresh is an on-line IMS program that will, under control of an IMS message, refresh and save any or all data bases being used in an on-line test environment. Once BDRfresh is invoked, it will perform the desired task and send the operator a "ready" message when the refresh or save operation has been completed, the spokesman added.

The package is available now for $18,500 from BDR at 17 E. 45th St., New York, N.Y. 10017

Bollinger Claims Blasted as Wrong

(Continued from Page 26)

to employ pointers embedded in records or pointers in external tables, there is nothing simple about creating such facilities.

Bollinger has omitted from his list of components the utilities and amenities which typically accompany commercially available data base packages — for instance, high-speed loaders, high-volume update facilities, dump routines and statistic routines. He also omitted the need to maintain the software, enhance it and adapt it to new operating systems and I/O gear.

If He Leaves?

We might also mention the problem of what an organization does when the single person who understands the system (for $20,000 this is presumably a one-man effort) decides to leave or gets hit by a truck.

Finally the reader is directed to an excerpt from a Datapro Research Corp. report which appeared in the same issue of CW. An analysis of requirements and an objective cost analysis is unlikely to indicate an in-house data base project is reasonable.

However, do go through the exercise. You may just recognize that you do not need the power offered by commercially available packages. In that case, a stripped-down set of routines may be appropriate.

But don't expect them to be cheaper to develop than what you could acquire in the marketplace.

Robinson is an independent consultant operating as S.L. Robinson & Associates, Morrisville, Pa.

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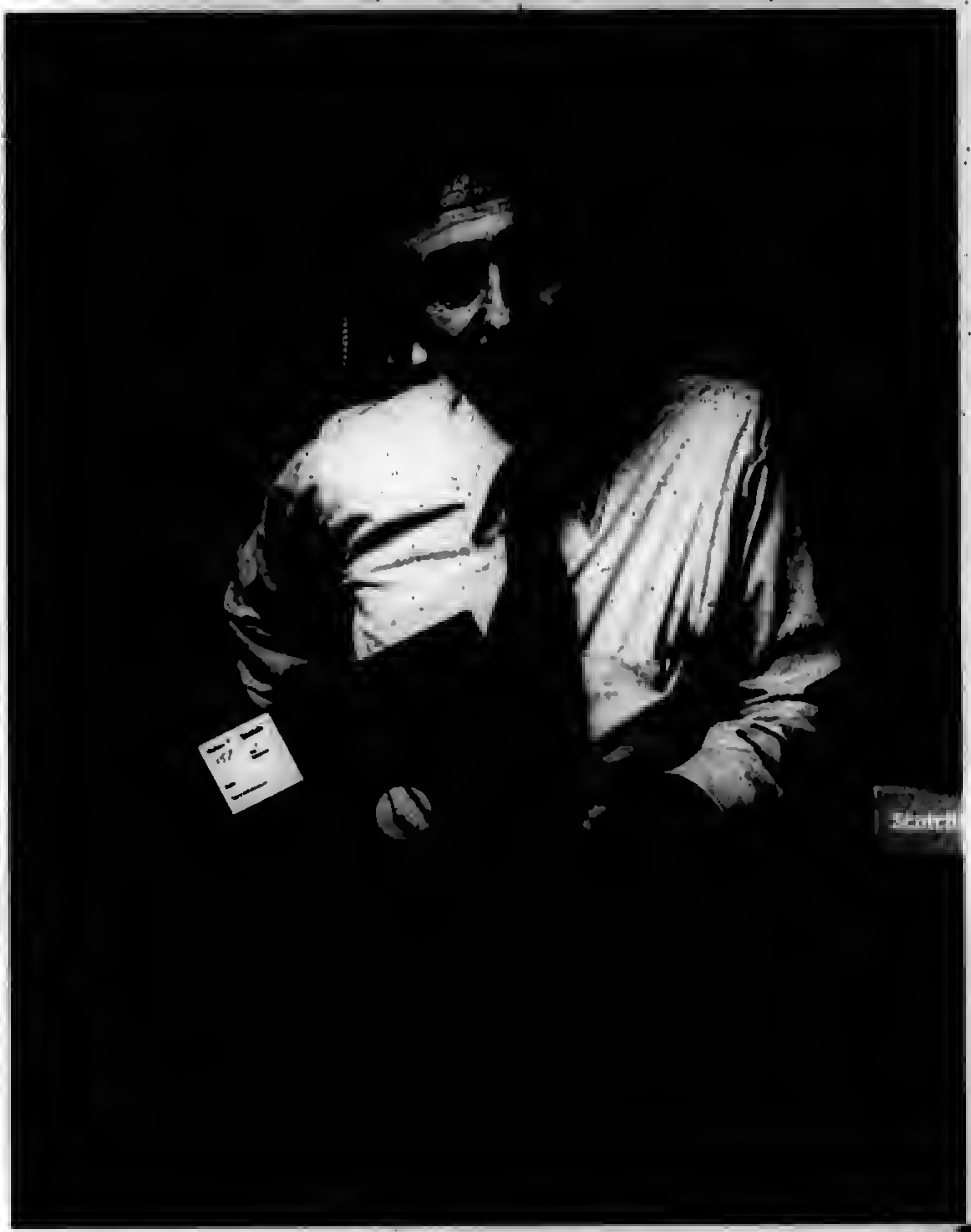

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CPE Effort Eases Manufacturer's DP Functions

Special to CW

SOUTH BEND, Ind. — Guessing at problems and developing possible solutions may be challenging, but being able to clearly identify problems and solutions can make life a lot easier. At least that's what Ron Gallagher, corporate manager of resource planning and technical consulting for the Bendix Corp., has found during his 11 years with the company.

Bendix operates two large regional data centers, two secondary centers and 18 stand-alone systems across the U.S. The two regional centers are located here in South Bend and in Ann Arbor, Mich., while the secondary centers are located in Sidney, N.Y., and Teterboro, N.J.

In Ann Arbor, Bendix operates a 2-byte IBM 370/155 with a Dynamic Address Translation (DAT) box to provide its users with virtual storage capabilities. Here in South Bend, the firm operates a 4-byte IBM 370/158.

"The corporation's hardware resources represent a wide array of mainframe systems and peripheral subsystems covering most of the major equipment suppliers," Gallagher said. "Since these sites do so much vital work for the organization, it's important that we understand the performance characteristics of these systems so their maximum processing potential can be realized."

Hardware Monitor Difficult

To ensure Bendix receives this maximum return from its systems, the company began doing computer performance evaluation (CPE) more than seven years ago. "At that time we had a corporate software manager interested in CPE," Gallagher recalled, "but he was interested only in terms of using a hardware monitor, so that was what we initially purchased."

But Gallagher and his staff soon found the benefits derived from measurements made with the hardware monitor did not come as easy as he would have liked: "It gives very accurate information, but it's difficult and time-consuming to install. In addition, it takes much longer to verify and analyze the data than we would like. So we were willing to give up 1% or 2% of accuracy for a tool which was more easily usable by a nonhardware technician.

"We still use the hardware monitor occasionally," he continued, "but with our limited staff, the software monitor is the better choice."

When they researched the monitors available and the areas in which they planned to use them, Gallagher and his staff eventually decided to purchase the Configuration Utilization Evaluator/Data Set Optimizer (CUE/DSO) from Boole & Babbage, Inc.

Only the South Bend site has a permanently assigned full-time individual responsible for CPE. At the two other sites which have these products installed, systems programming and operations personnel handle the monitoring and evaluation tasks.

Summaries for Meetings

Emery Johnson, senior project leader at the South Bend site, runs CUE to constantly monitor such areas as the CPU, channel utilization and paging rates. DSO is run only on demand, when problems in disk data set placement are suspected.

The CUE reports are produced with shift summaries so that at daily production meetings, Johnson can discuss bottlenecks which have occurred in the system and how the resources are being utilized. In addition, he runs the graphics portion of the product so he can see what normal usage is and when these statistics may be getting out of normal bounds.

"For example, when I look at the paging graphics, I can quickly see what our peak paging rates are, when rescheduling of production workloads might be necessary to reduce paging or when we're going to have to have extra memory to handle the increased real storage demands," he explained.

He also studies graphic reports on such areas as channel, tape and direct access utilization as well as other significant indicators.

"When we think it's advisable, we initiate DSO to study disk volumes and head movements between data set pairs so we can reorganize our packs based on the generated reports. This allows us to reduce contention time and helps us improve the utilization of space on the disks," he said.

The only time the graphic reports go beyond the data center management, Johnson noted, is when upgrades are required. By using the reports, Bendix can forecast when additional hardware will be needed and document its justification.

CUE/DSO also helps his organization string out its upgrading requests by reducing bottlenecks and balancing the workload, Gallagher added.

To illustrate this point, he cited a problem which presently exists at an-

(Continued on Page 32)

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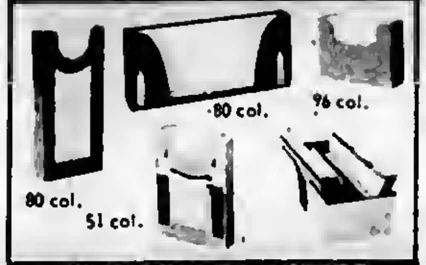

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3M Enhances Series 4000

ST. PAUL, Minn. – The Parallel Print/Extract (PP/E) program from 3M Co. is said to provide users of the company's Series 4000 Information Processor with "extensive" extraction options for list management. Multiple extracts can be performed, for example, with their output combined into a single list, a spokeswoman noted.

The Series 4000 is a minicomputer-based word processing system that can be used under software control to edit text, write letters, print labels or envelopes or prepare other forms. It reportedly has capabilities for global search and replacement, heading, footings and page numbering.

PP/E permits selection on five operator-defined positions on a CRT screen, with each position containing as many as 62 variables. The operator can extract or select a specific variable or a range of variables on each position simultaneously, the 3M spokeswoman said.

The program permits extraction by first letter/first line, first letter/last name and Zip Code simultaneously with, or independently of, the defined selection indicators or screen positions.

Names and addresses meeting specified criteria can be counted, with the total displayed. Other advantages of the $300 package include on-screen operator prompts, 3M said from Department LX8-32, P.O. Box 33600, St. Paul, Minn. 55133.

Users Can Work With Vsam Through 'Symdata' Update

NEW YORK – DOS- and DOS/VS-oriented Release 5.0 of the CA-Symdata test data generator from Computer Associates is said to support more file types than earlier versions, to include a user exit facility and to provide a selection capability that permits the tailoring of generated files.

Symdata is programming language-independent, eliminating the need to modify source programs in order to generate test data. Only three types of control commands are required to define the test file to be created, a spokesman said.

The first type of control identifies the characteristics of each field; the second, the characteristics of the record; and the third, the characteristics of the file, he explained.

Release 5.0's extensions enable users to work with Isam and Vsam files in addition to various earlier file types. CA-Symdata will read an existing file in either of these newer formats and create a file that matches the input type.

In addition, users can now extract data from an Isam or Vsam file to build a subset, the spokesman said.

The user exit facility allows the user to write modifications to CA-Symdata which can process a file in unique ways at Open, Close, Read or Write times, he continued.

With the selection capability, records originating from the user's live data file may be processed selectively to create smaller test files.

The test files created by Symdata can be on magnetic tape, disk or punched card, the spokesman noted, adding that such flexibility makes the package "extremely valuable" as well as easy to use.

CA-Symdata runs under IBM DOS and OS (and the VS counterparts) as well as CMS. It costs $4,800, he said from 655 Madison Ave., New York, N.Y. 10021

CPE Effort Aids Manufacturer

(Continued from Page 31)

other Bendix site that doesn't yet have CUE/DSO installed. "They've been putting together their justification for the product, but as of right now, they are still operating without completely accurate statistical performance and workload data," he said.

"They've been having a capacity problem," he continued, "and we have theorized what the problem is, but unless there is some way of measuring the system, we can't prove where the bottleneck is and what system modification or hardware upgrade alternative is right for this situation."

More Memory?

This site is running at a high paging rate and the staff there feels that the answer is more memory. However, Gallagher noted that paging drops considerably in the evening.

"On the second and third shifts, where they don't have a high paging rate, added memory alone isn't going to solve this capacity problem," he observed. "I think what they need is a combination of more real storage and added processing power, but without the necessary statistic reports I'm only guessing."

Once this site has CUE/DSO, Gallagher feels it will be able to better optimize its existing system and develop the trends and facts it needs to justify tomorrow's system requirements.

"Once it begins daily monitoring of its workload," he concluded, "it will be able to prove to management that it is getting the most out of the existing system and providing a level of service consistent with the available resources. Then, when additional hardware is needed, the documentation and justification of the upgrade will be quite easy.

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To Run With 'Supercontroller'

Nets to Offer Technology Mix, Doll Says

By Ronald A. Frank
CW Staff

NEWTON, Mass. — Networks are on the verge of offering users a mix of technologies to best meet specific applications needs, according to data communications consultant Dr. Dixon Doll.

Bell Canada has already taken steps toward integrated network offerings that combine various technologies in one service. Specifically, the Dataroute service now offers both integrated packet-switching and fast circuit switching, he noted.

Satellite facilities will be added to these integrated nets later, Doll predicted in a recent interview here.

Many users today feel that contention switches used with fast circuit-switched facilities are suited for certain applications and they will install these capabilities on their in-house networks if these facilities are not offered on public nets, he said.

Fast circuit switches such as Computer Transmission Corp.'s M3200 may introduce a longer time delay when the channel is being set up, but then this is the only technology that can provide the user with a predictable level of response time and capacity, he maintained.

Two Service Classes

Two general classes of service — two-ended and one-ended — will emerge on the integrated nets, Doll continued. Two-ended services identify both a receiving and a sending unit at the time the channel is established. Packet switching, such as the services provided by Telenet Communications Corp. and Tymnet, Inc., or fast circuit switching can be used, The response time going through the network with a fast circuit-switched facility will have more predictable delays not subject to intermediate stage queuing.

This type of channel is better suited for applications that have a predictable throughput, such as file transfers.

On the other hand, the packet-type facility is more suited to statistical or interactive uses involving varied levels of traffic.

Satellite Technology

Satellite technology can be used more extensively for broadcast-type services. Satellites are also well suited for bulk file transfers, Doll said.

The key point is that packet technology may be only a partial answer to user network needs, according to the consultant.

From the carrier's point of view, there must be other technologies to provide varied transmission environments. An example of the one-ended facility would be a datagram-type service such as that proposed for Canada's Infoswitch network.

Here the user does not have to establish the destination location in order to input the message into the network. The user would sign onto the net and declare the type of transmission desired.

Infoswitch will provide three levels of service depending on the needs of the application.

Doll noted that such integrated services are growing in number. Even Bell has given some indications that integrated offerings will eventually be part of the Advanced Communications Service, he said.

To use services involving several types of technology, the user will have to request the type of network transport technology desired when the network session is established.

At the same time, users will need the capability to go out to private network facilities as well as carrier services. These private nets would be in-house configurations based on Systems Network Architecture, Decnet and similar offerings.

'Supercontroller' to Emerge

To accommodate the varied network choices available to the user, there will emerge a "supercontroller that goes way be-

(Continued on Page 34)

On-Line Net to Keep Records Straight for Canadian Hotels

By Ronald A. Frank
CW Staff

TORONTO — Keeping accurate records is important for hotel managers. A room unsold today is revenue lost forever.

Computerized back office information is vital for a hotel to operate efficiently. But when 24 locations with 28 properties are involved, an on-line network is the only way to keep things running smoothly.

For Canadian Pacific (CP) Hotels, a data communications network is replacing various manual recordkeeping systems in order to optimize operations in its coast-to-coast chain.

The hub of the planned network will be in Toronto at the Royal York Hotel, which is one of the major facilities in the CP Hotel chain, according to Brian J. Hall, executive director of systems.

The company has installed dual IBM System/3 CPUs to handle back office operations including general ledger, cash control, accounts receivable and other functions that must be tracked on a real-time basis by hotel management.

Infocall Network

In order to connect its widely dispersed sites into a network, CP Hotels has decided to use the Infocall service from Canadian National Canadian Pacific (CNCP) Telecommunications. The Infocall network will allow CP Hotels to get the benefits of packet technology without having to rewrite existing hardware and software routines, Hall explained.

CW Photo by R. Frank

Abdul Amarshi checks System/3 at CP Hotels' DP center.

The company installed dual System/3s early in 1977 and is now on the verge of automating its hotel sites by providing intelligent terminal workstations to its dispersed

(Continued on Page 36)

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Terminals Put Order at Control Division Site

OWATONNA, Minn. — To administer the specialty maintenance tool programs for large farm equipment manufacturers and their dealers, the Service Tools Division of the Owatonna Tool Co. processes more than 500 orders a week.

To help keep track of the orders for maintenance tools, the division uses a key-to-disk terminal system.

"The system is a real boon for us," operations manager Bill Ahrens said, "and it's a relief to the corporate DP department." Besides serving the DP needs of the company, the headquarters DP group also handled the division's daily orders and shipping orders plus maintained the customer files and updated the equipment listing of all the line items.

In December 1977, a number of factors, including an order entry rate that had doubled in three years, led Ahrens and systems analyst Mike O'Neill to abandon the division's keypunch system in favor of a Data 100 Corp. Keybatch system with three CRTs.

"For us," Ahrens commented, "it means that we are no longer subject to the occasional two or three day delays of the company's month-end closings, annual inventories or our own rush orders. We found that we were suddenly the masters of our own destinies. We could smooth the flow of paperwork, decrease the amount of errors and be more responsive to our users."

Now two operators key in order data via the terminal keyboards. Using specially designed programs — from order and customer numbers to prices, taxes and discounts to transportation and order status — the Keybatch system guides the operators through the data entry process.

As the operators key in the data by entering a single-digit code number instead of a longer, descriptive phrase, the data is compared against tables in the system's five million-character disk storage device, ensuring it is within acceptable ranges prescribed by the system.

Because of the increased data entry speed, the operators now have more time to devote to other duties such as credit verification, obtaining new customer account numbers and updating the account record.Not only do the operators key in the order entry information, they also maintain the customer files and enter daily shipping information.

Accountability for Accuracy

Along with increased performance, error rates have also decreased significantly, Ahrens noted. "It used to be demoralizing when the headquarters DP department gave us the error listings," Ahrens said. "It was assumed that if there was a mistake, we had made it. In many cases, that just wasn't so. Now the paper never leaves our offices — the operators have total accountability for the data and its accuracy."

Thus far, the operators have scored high marks, and error rates are consistently below 1%. One month the errors rose to 6-1/2% but a daily follow-up edit procedure immediately caught and identified the problem. Once the error was identified, it was a simple matter of the operator doing the "job out" procedure over again — simply and quickly with little effort and no loss of order entry information.

The greater productivity of the Data 100 terminal system has helped Ahrens create greater goodwill among customers and improve cash flow for the division, Ahrens said. "If a dealer has a tractor that needs repair, he doesn't care about our problems.

Nets to Offer Technology Mix

(Continued from Page 33)

yond anything available today," according to Doll. On the user's side of this supercontroller there will be mainframes, minicomputers and PBXs, while on the network side there will be satellite facilities; SNA facilities and industry nets like Swift.

The supercontroller will be supplied by independent vendors like Collins and Northern Telecom. This new controller will be to the data user what the watboxes and Infoswitches have been to the voice user, he predicted.

The SL-1 digital PBX from Northern Telecom is an early example of the supercontroller since it has the same kind of technology. But even though it is an advanced device, the SL-1 does not yet have the multifunction capability the new breed of supercontrollers will have. "It is a digital switch and it has the flavor of what is coming," Doll said.

Contention Switch

The supercontroller will be a high-level contention switch that is not really protocol-sensitive: It will make the required physical connections to a specific network facility and then the individual protocol-sensitive modules in the various nets will be provided by those who interface to the networks.

The recently announced processor by CTX, Inc. that takes Binary Synchronous Communications devices and makes them compatible with an X.25 network is a step in the direction of the supercontroller, Doll said, although it is not yet the entire answer.

The basic technology needed for the supercontroller is already available, he noted, but what is needed is the "brave system integrator" who will mesh product capabilities now provided by many suppliers.

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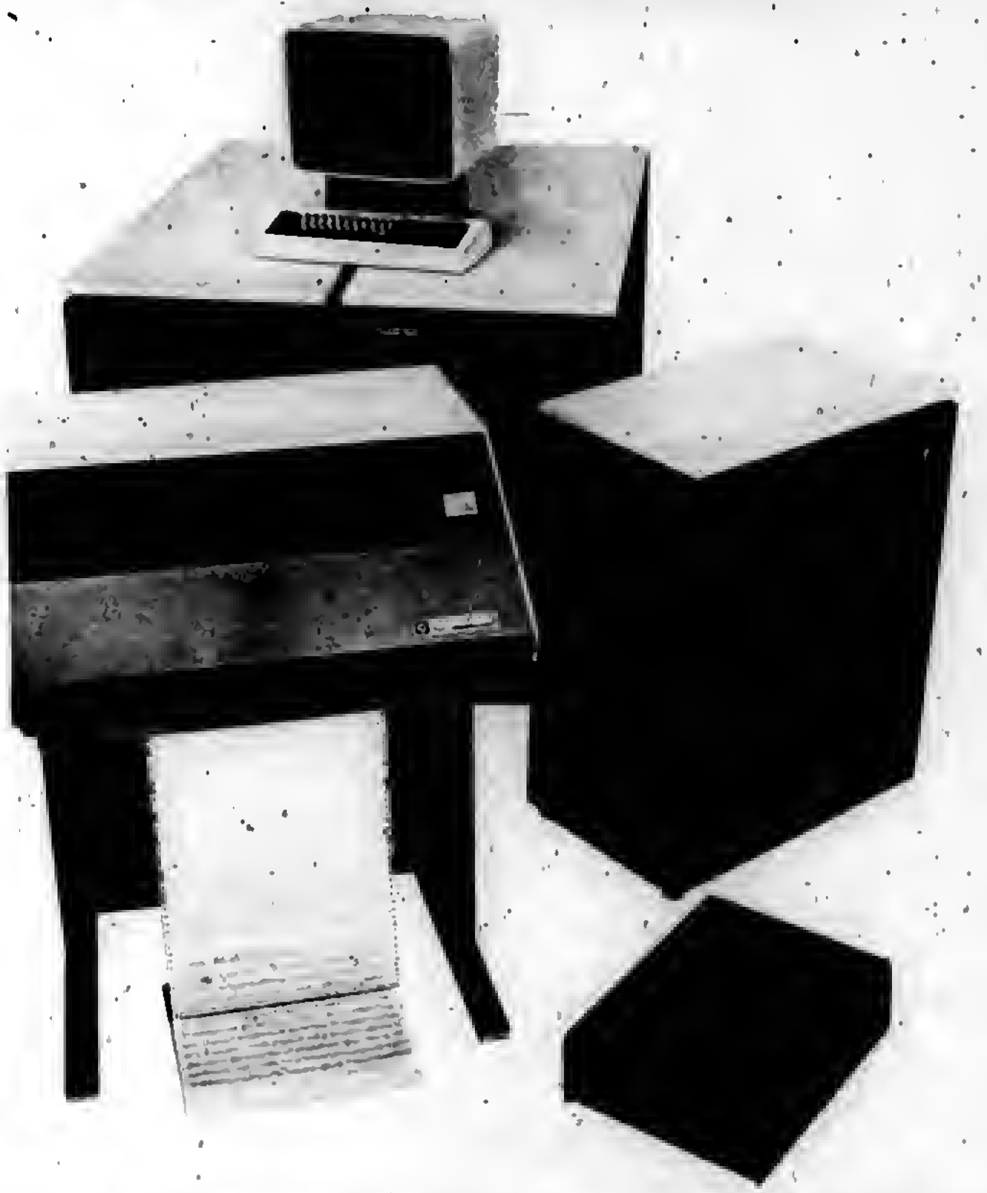

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Seminar Slated

NEW YORK — A seminar examining the correct user approach to implementing a DP/data communications strategy will be held by the Yankee Group Dec. 5-6 at the Harvard Club here.

Using a case study method, the two-day session will look at models of implementation, discuss "avoidable mistakes" and evaluate new technologies and their applications.

The presentations will cover such topics as building the applications, organizing the DP-data communications operation, planning and control and "internal marketing."

The seminar costs $550. Further details are available from The Yankee Group, Box 43, Cambridge, Mass. 02138.

Network Keeps Records Straight

(Continued from Page 33)

locations. The workstation includes an Ontel OP/1 CRT with 10K bytes of random-access memory and programmable read-only memory Prom storage that can emulate 3277 protocol functions, Hall said.

The System/3 CPU in Toronto will be able to poll the remote terminals which look like IBM CRTs operating with 3270 protocol.

Asked if there was any significance in CP Hotels' decision to use CNCP's network service, Hall said the Hotel group operates separately from the carrier. "We deal strictly at arm's length," he explained, adding that if there had been more cost-effective services elsewhere, he would have selected another solution.

To reinforce his point, Hall said IBM had suggested a net of 3275 terminals in a multidrop private-line configuration, but this would have been several times more expensive than the Infocall approach.

Printers for On-Line Access

The workstations are provided by CNCP as part of the network offering. The intelligent CRTs will include Centronics Data Computer Corp. 306C printers to give each hotel on-line access to the corporate DP center at the Royal York.

Each terminal will be used for both local 3270 operations and on-line transmissions. Specially designed front-end versions of the terminal will convert the 3270 output into 1,200 bit/sec Ascii data for transmission to the System/3. According to Hall, the terminal workstation will cost $375/mo with an additional $80/mo for each terminal access, and this is more cost-effective than other solutions.

Although 1,200 bit/sec may seem like a low transmission rate for the terminals, Hall noted that the average time for the CPU to answer a remote site is "eight to nine seconds." In addition, the local mode printing capabilities is a feature that would not be available with IBM terminals.

Initially the system will be programmed for revenues, cost of sales and similar back office functions, according to Tom Adhoch, senior programming analyst, but later room reservations and other applications will be added.

The System/3 CPUs operate with IBM's Communications Control Program (CCP) to poll the remote terminals. The applications programs are being written in RPG-II, and the screen formats are being designed for simple use by relatively unskilled operators who typically will be working on the corporate controller's staff at each of the hotels.

Hall would much rather keep his four programmers busy with applications software development than worry about teleprocessing software. The Infocall service was attractive because it is transparent to all existing hardware and software procedures, he noted.

Possibilities for Future

The System/3s each have 512K bytes of storage of which 300K bytes will be devoted to the recordkeeping system now in its final stages of development.

Hall accepts the possibility that implementation of all planned applications could cause the DP center to outgrow the System/3s. CP Hotels has been looking at alternative CPUs, and the IBM System/38 may provide the necessary additional capability, but a final decision has not yet been made.

Before installing the present CPUs, CP Hotels was using time-sharing facilities at Computer Sciences of Canada.

As the on-line Infocall applications begin to operate on the net, increasing amounts of needed data will be available on a real-time basis, Hall said.

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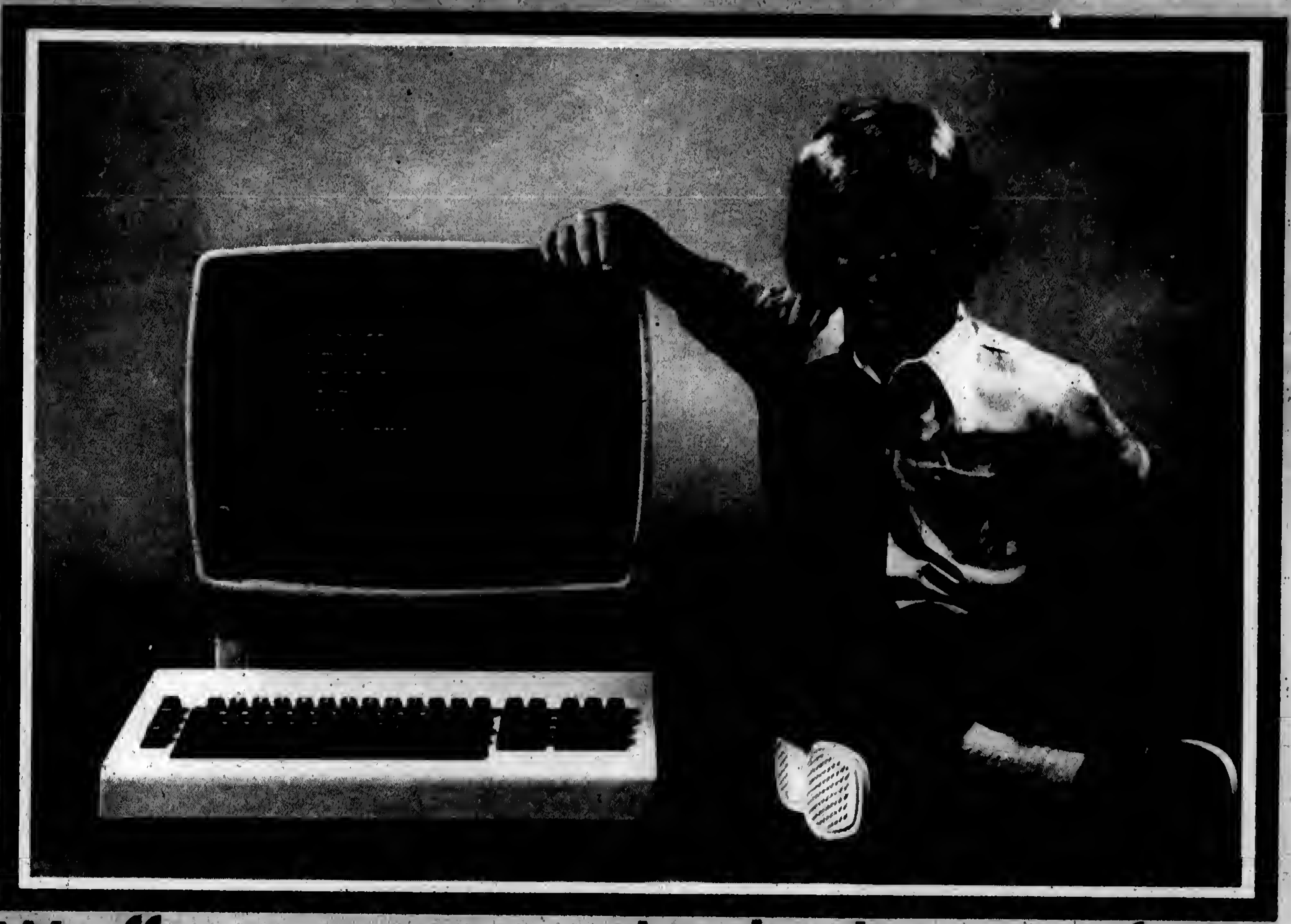

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John R. Cola, Director of Information Systems, Nissan Motor Corporation in U.S.A., Carson, California

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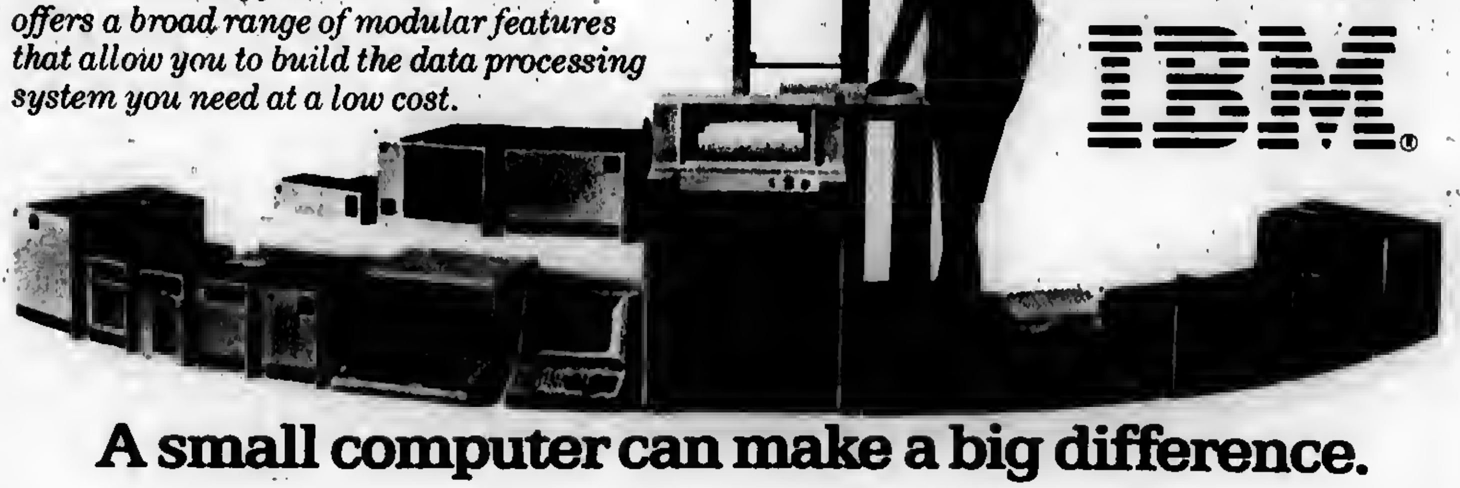

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CUPERTINO, Calif. — Toll-free access to Tymnet, Inc.'s public packet communications network has been added in 13 cities, bringing to more than 150 the total number of local access locations. These are complemented by nationwide Wats coverage, the company said.

Tymnet has also added its 31st location with 1,200 bit/sec local terminal access support. Since April, the company has added 1,200 bit/sec access in 10 cities including Portland, Ore.; Louisville, Ky.; New Orleans; Seattle; El Segundo, Ca.; Phoenix; Darien, Ct., Hartford, Ct., Baton Rouge, La.; and Memphis, Tenn.

The latest local access locations include Nashville, Tenn.; Lexington, Ky.; Hayward, Ca.; Chattanooga, Tenn.; Charleston, S.C.; Knoxville, Tenn.; Jackson, Miss.; Greensboro, N.C.; Manchester, N.H.; Columbia, S.C.; Spokane, Wash.; Fresno, Ca.; Savannah, Ga.; and Plymouth, Mich.

Tymnet's international access also has expanded with the addition of Austria, Italy, Hong Kong and Singapore. Tymnet service now is available in 15 foreign countries through international record carriers and postal, telephone and telegraph authorities.

Approval for service from at least three other countries is expected before the end of 1978.

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Emulators Tie Harris 8000 To Three Makers' CPUs

DALLAS — Enhanced communications emulators to interconnect Harris Corp. 8000 series intelligent terminals with most Honeywell, Inc., Univac and Burroughs Corp. mainframes have been announced by Harris' Data Communications Division.

Revised software releases of the Univac and Burroughs protocol emulators already have been field tested and put in use at customer sites, and additional revisions to all three emulators are scheduled for the next six to 12 months, the firm said.

The revisions in Harris' emulators will handle the hardware and software introduced in recent months by the mainframe manufacturers, a spokesman said. They reportedly include capabilities for queued transaction handling, local format storage, remote printers and random-access disks and diskettes.

Harris' 8770 terminal system now provides data entry and retrieval compatibility with Honeywell's 7760 diskette-based interactive terminal and with VIP 7700R/7705R terminals, which replaced the VIP 7700 series. The 8770 is supported by Honeywell 200/2000, 400, 600, 6000 and 60 series computers and front-end controllers under the MSR/2000, OS/2000 and Gcos operating systems; the emulation will be available in June.

Harris' 8210 terminal system emulates Univac's Uniscope 100 and 200 terminals and the UTS 400. It is supported by Univac's 1100 and 9000 series mainframes and by Series 70 and 90 units tying into Univac, CTMC or DSC communications controllers.

Software compatibility is provided for the OS/3, OS/4, OS/500 and 1100/OS operating systems. The 8210 also is being used with the 1100 series with Exec8 and on 9000s with MCP and IMS; it will be available in January.

Harris' 8220 terminal system now emulates Burroughs' TD830 interactive terminal and the earlier TD800 and TD820 versions. It is supported by all Burroughs mainframes and front ends, including the B1700, B2500 and B4800 series and the B6700, 6800 and B7700, all under the MCP operating system and NDL communications.

The cost of the emulation features has been bundled with that of each terminal, the spokesman said, from the Data Communications Division, 16001 Dallas Parkway, Dallas, Texas 75240.

Dataroyal IPS Line Gets Unit Offering 150 Char./Sec

NASHUA, N.H. — Dataroyal, Inc. has introduced a higher speed addition to its IPS-7300 line of intelligent hardcopy terminals. Priced at $4,675, the 150 char./sec IPS-7326 complements earlier units with 120 char./sec output rates, according to a spokesman.

The IPS-7326 combines a matrix printer with an 8-bit programmable microcomputer. A movable data input station consisting of a gas discharge display and Ascii keyboard is also standard on the system.

Its microcomputer architecture allows the 7326 to be programmed to meet specific application requirements and then reprogrammed when those requirements change by plugging in programmable read-only memory (Prom) chips, the spokesman explained.

An IBM 2848-compatible serial interface is standard on the IPS-7326 and a 20mA current-loop interface, as well as other serial interface types, are available as options. The firm is at Main Dunstable Road, Nashua, N.H. 03060.

Service Eases Car Recalls

BEDMINSTER, N.J. — A Bell System national account group team working with Ford Motor Co. personnel has helped develop a nationwide communications service to help Ford and Lincoln-Mercury dealers determine the recall status of any Ford vehicle built since the 1968 model year.

The service is called the Computer-Assisted Recall System (Cares). A team of Long Liners working in Dearborn, Mich., with the Ford Parts and Service Division contributed a year and a half of effort to develop the system.

"Cares is one of several components to help Ford streamline its recall procedures," according to Robert Gross, Bell System national account manager.

The system ties a dealer into a system that can tell within seconds if a vehicle is subject to recall for either mechanical or emission problems.

To use the system, a dealer using a telephone with a Touch-Tone pad calls toll-free to an IBM 3033 mainframe and punches in a code identifying the vehicle. The CPU then responds through a Periphonics T-Comm/7 audio response system with information about the vehicle's recall status.

The service is the result of a team effort in which the Bell account team helped Ford develop the prototype dealer worksheets and provided a technical assistance hotline for Ford parts and service personnel.

"In the past, consumers and dealers had to depend on mailed information. With this system, a dealer can answer a question about recall in a matter of seconds," Gross said.

The system is also a money-saver for Ford. "The system resulted in a $250,000 savings over what time-shared computer alternatives would have cost. Because Ford owns the system, it will be possible to add customer and dealer services in the future with little or no problem," Gross said.

The service will be available to each of Ford's approximately 6,600 dealers. It will function Monday through Friday, from 6 a.m. to midnight.

Efficiency the Aim

'Networking' Has Many Meanings, One Goal

By Patrick K. Phillips
Special to CW

With the industry just beginning to dig out from one of the most massive promotional campaigns ever to accompany a single technological concept — distributed DP — users are again being barraged by a new term: "networking."

The term has alternately been used to describe a collection of systems, connected to each other and a host computer, connected to each other only or connected to a host computer only. Depending on the definition, the systems may either be cable- or communications-connected.

Whatever definition one chooses, however, the objective of networking is the same — to connect products in the most efficient manner possible to solve DP and communications problems.

In most cases this means remote systems not only need to be compatible with each other, but with mainframe manufacturers' systems as well. Users should not be expected to modify the software in the mainframe to accommodate differences in communications protocols for a variety of terminals on the primary (system-to-host) communications network.

Product Connection

Both a primary network and a secondary ring, or subnetwork, can exist within a network. On the primary ring (the first level removed from the mainframe), systems are interconnected via single lines from a mainframe to individual systems (point-to-point) or via multipoint lines from the mainframe to several systems.

The choice of protocols used in the primary network depends on a number of factors, including traffic and types of peripherals as well as host processor configuration requirements.

Looking beyond the primary network, a secondary network can be established in which second-level terminal systems communicate with primary terminal systems. Where the primary terminals are used to provide store-and-forward data to the mainframe, the secondary network terminals can be used to provide data entry or transaction-oriented activities for input to the primary terminal.

Systems should not only allow effective communications with the host processor via the primary communications network, but should also provide both batch and interactive communications in the secondary communications network.

Secondary Networks

Within the past 12 months the communications and processing capabilities of terminal systems on the primary communications network have grown more sophisticated. Today's terminals at the upper end of the capability spectrum include operating systems and multitasking capability — allowing concurrent high-level execution along with communications — as well as having the capability to support remote terminals which can be used for source data entry, program preparation, and other tasks.

A secondary network provides the means for remote workstations to be attached to the primary terminal and run as if they were locally attached. Once the workstation is placed at a remote site, a need has been created to print reports at the remote location, thus creating a need to ship "batch" data to the secondary site.

Users should expect and are entitled to receive reliable communications between the primary terminal and the secondary or subsidiary terminal. This implies synchronous transmission with more sophisticated error-checking and retransmission capabilities than that provided under asynchronous discipline. Thus the primary terminal has become a minihost.

Three Benefits

As terminal systems have become more sophisticated and user needs for DP have grown, the pendulum has swung back from the strong central mainframe point of view. Some of the applications performed on the mainframe are off-loaded to terminal products at remote sites. This provides three beneficial effects for the user.

First, the mainframe is unburdened of some of the workload. Second, the network is freed of a few traffic requirements — particularly those of an interactive nature — thus saving substantial network communications cost. Third, the belief is returning that source data entry should be the responsibility of the local division.

The transmission of data to a central site for processing when results are needed back at the originating site is a waste of communications resources. The use of communications facilities for a simple DP function such as data entry or program preparation is likewise a waste of resource for the network owner.

The terminal network owner must constantly look for ways to reduce the communications and processing requirements. They go hand in hand and must be optimized together, not individually.

Because of technological advancements in software engineering, hardware and communications protocol, users can expect to see terminal systems and terminal-based networks continue to grow with the inclusion of additional functions. This can occur by expanding the terminals themselves into multiprocessor systems, connecting them by more and more sophisticated communication protocols.

Software, both vendor-supplied and user-written, will become more easily available with the advent of higher level languages, producing more reliable and sophisticated software products for terminal processors.

Smaller, lower-cost and more sophisticated hardware will in turn allow larger multi-processor terminal offerings. Functions which are now forced to fit into a single processor in a multiprocessing or multitasking mode — such as volume data entry (key-to-disk), source data entry and remote job entry — will migrate into separate processors in a multiprocessor system accessing a common data base.

This data base will be resident at a primary terminal node and will in turn be accessed by "remote remote" (or subsite) terminals. Users will request and pay for incremental functions by connecting additional processors to the terminal network at appropriate locations.

More sophisticated communications protocols will allow interactive and batch access from both secondary and primary terminal sites to all important nodes in the network. Communications technology will improve and begin to minimize communications cost.

Because of hardware technology advance, this implies that in a large terminal network even the most simple terminal product at the farthest remote location will be able to perform such sophisticated tasks as compression, error checking and correction and encryption.

Communications sophistication will allow terminals to become "logical units" rather than "physical units" in terminal product networks. Terminals will in a sense become remote peripherals to mainframes.

All the indicators are that the 1980s will bring a dramatic increase in network size, in the number of terminals installed at the far-flung reaches of user locations and in the variety of richness of functions and applications provided on those terminal offerings.

Phillips is director of product planning at Data 100 Corp., Minnetonka, Minn.

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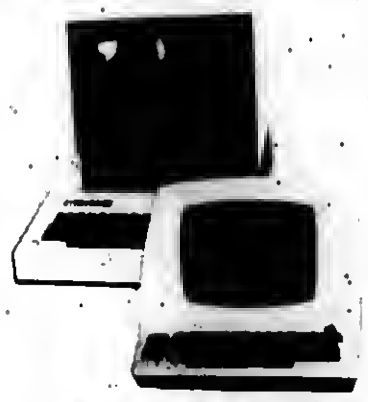

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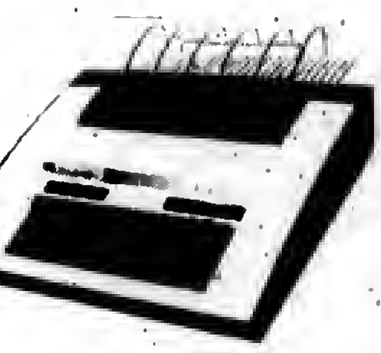

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Sweda Offers Restaurant ECRs

PINE BROOK, N.J. — Sweda International, a division of Litton Industries, has introduced two electronic cash registers (ECR) — the 4610 for lounges, taverns and smaller restaurants and the 4620 for larger fine-dining establishments.

The microprocessor-based ECRs were designed for heavy use in demanding environments and reportedly offer high flexibility in application, selection and management control.

In bar and lounge applications, the Model 4610 offers 25 preset departments and simultaneous operation by two clerks, with the printing of separate media totals through "B" keys. This feature may be tied into an optional second cash drawer.

In fine-dining applications, the Model 4620 offers 100 preset departments through Sweda's "paging" keyboard — by turning a page on the keyboard, the operator can change departments (menu items), which saves valuable keyboard space, a spokesman said.

Model 4620 options include an additional 100 departments and precheck control for up to 16 servers, with individual server sales totals, that allows the 4620 to be used as a precheck unit or both.

Members of the L-45 series, both machines offer 170 price lookups; previous balance and service; the calculation of two different taxes automatically and another tax manually; calculation of waiters' and waitresses' tip totals; production of 10 department reports, in which each department can report to three different groups at one time and, through an optional check number control system, the tracking of up to 128 checks at one time, with a report on outstanding checks.

Standard features of both the 4610 and 4620 include descriptors of up to six alpha characters; nine tenders, for cash, check and seven charge cards or miscellaneous tenders; an alphanumeric operator display; an illuminated keyboard; a real-time clock; programmable check endorsement; a "journal low" indicator; true-customer count capability; and programmable chit printing for departments and/or tips.

An auxiliary battery to provide backup power is offered as an option on both registers.

Prices start at $2,795 for the 4610 and at $2,995 for the 4620. First deliveries are scheduled for February from Sweda at 34 Maple Ave., Pine Brook, N.J. 07058.

Terminal Queries Clients For On-the-Spot Surveys

COSTA MESA, Calif. — MSI Data Corp. has introduced a data entry terminal that reportedly offers quick customer feedback. The unit, called Tellus, was designed to monitor consumer attitudes on-the-spot in such places as hotels, supermarkets and hardware stores.

The "push-button questionnaire" will offer another option to companies seeking customer feedback, an MSI spokesman said. Methods such as personal interviews, telephone canvassing, comment cards, mail surveys, market share studies and financial indexes can be prohibitively expensive, too slow to provide timely remedial efforts or often elicit too small a response.

With Tellus, a customer can answer a set of 11 questions in 30 seconds, and the unit "doesn't intimidate customers or provoke a confrontation," the spokesman added.

The initial marketing effort for Tellus will be in the lodging industry, with possible future use in restaurants, department stores, financial institutions, airlines, car rental agencies and market research organizations.

Questions to be asked and the customer's available responses are specified by the purchaser and can be changed at any time.

The terminal is a self-contained unit that can be used in any high-traffic area, MSF said.

Data can be displayed on the unit itself or on a series of preprogrammed reports printed on an optional 12-column printer.

Another option permits a user to collect and store information for later transmission to a CPU for statistical analysis.

Costs range from $1,500 for the basic Tellus unit to a maximum of $3,000 with options. First deliveries are scheduled for next spring.

MSI Data Corp. is at 1381 Fischer Ave., Costa Mesa, Calif. 92627.

Spectron Lowers Datascope Price With $1,900 Cut

MOORESTOWN, N.J. — Spectroh Corp. has reduced the purchase price of the D-301 Datascope monitor from $6,800 to $4,900.

In announcing the price reduction, Spectron said the large number of orders for the D-301 since its introduction earlier this year "has enabled the company to increase its production plans and thus reduce the price of this Datascope monitor."

The D-301 is a portable, general-purpose data communications line monitor that provides a full-duplex display of transmit and receive data. It features independent line discipline set-up for transmit and receive sides of the line.

Full-duplex data at transmission speeds up to 72K bit/sec can be stored in a 262K-bit electronic buffer. A search of the buffer contents using a user-selected argument of up to four characters is standard.

Displayed data can be frozen, and the code, bit order, right or left justification (for less than 8-bit characters) and location of highlight markers can be changed.

Spectron is at 344 New Albany Road, Moorestown, N.J. 08057.

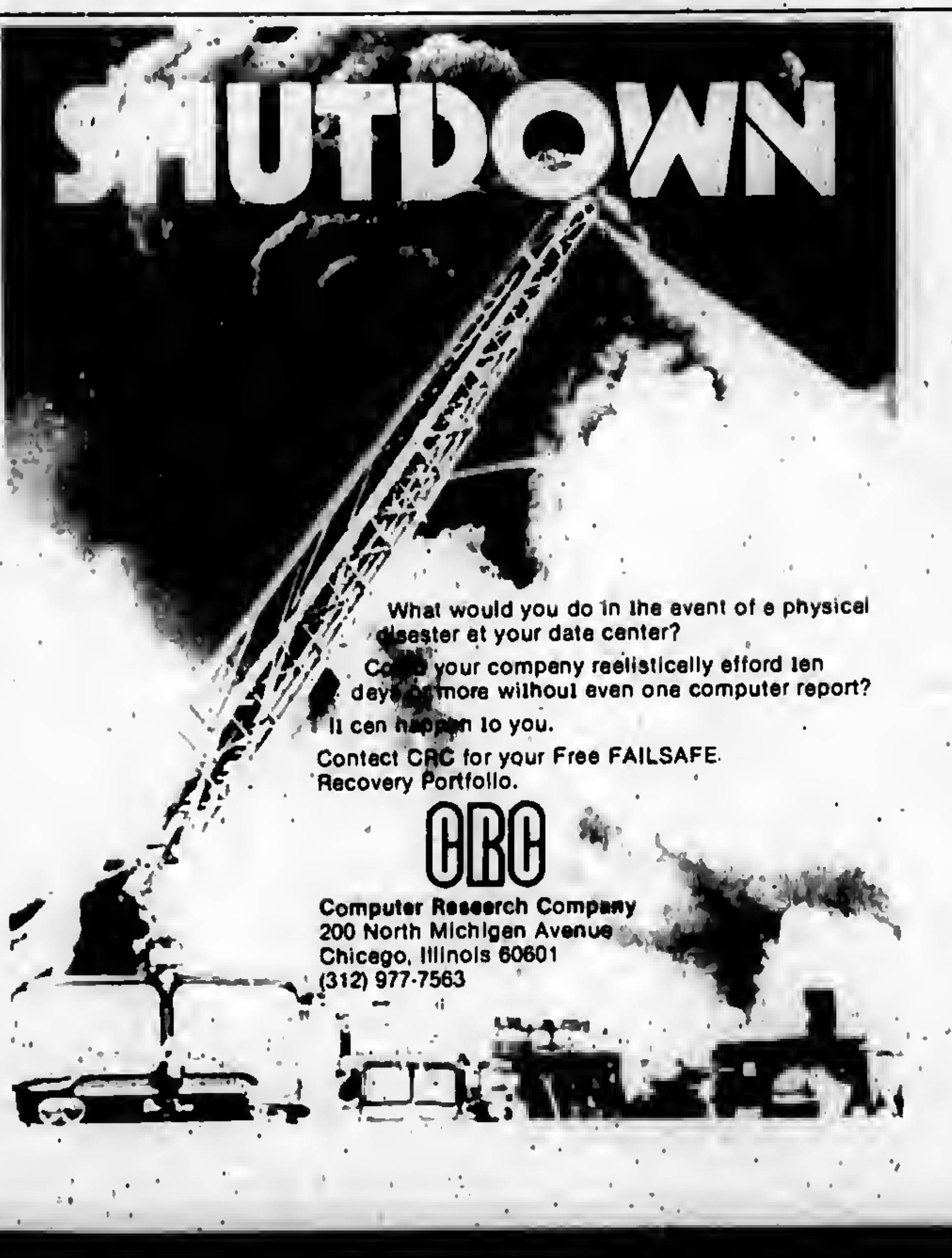
TAC Unit Compatible With IBM System/7

ATLANTA — Technical Analysis Corp.'s (TAC) Label/300 1C/S7 is said to emulate the addressing and message sequences of the Dataroyal, Inc. IPS-7 using a communications protocol compatible with the IBM System/7 as it is defined for remote peripherals (IBM 2848, 2260 and 1053).

The Label/300 can be used as a replacement or alongside the Dataroyal without any changes in system software or in communications hardware.

The product retains all the special printing features of the Label/300, uses an RS-232 interface and supplies all signals necessary for operation with a Bell 202C or similar modem.

The Label/300 is available for $8,500 from TAC at 120 W. Wieuca Road N.E., Atlanta, Ga. 30342.



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AUSTIN, Texas — How can you pare salary levels and, at the same time, increase employees' take-home pay, boost productivity and reduce turnover? City National Bank, with assets of $390 million, has found a way to accomplish all this, while still keeping employees happy.

After changing some equipment and revamping structures as a result of those changes, the bank has increased its volume of business, decreased its error rate and made performance evaluation and administration easier.

In addition, the bank feels it is attracting more motivated, more productive employees, while discouraging the less competent ones. "Our production/pay system attracts good operators and discourages poor ones. Our guaranteed hourly rate is set relatively low, and unless an operator is good enough to earn production pay, all he makes is that guaranteed hourly rate," according to Ken Johnson, marketing services representative for the bank.

"The way our system is structured, good operators can earn a lot of production pay and enjoy high hourly rates. Now I believe we have the fairest salary plan possible," he said.

The bank was able to carry through this plan by replacing its card-handling equipment — keypunches and key verifiers — with a key-to-disk data entry system.

Other measurable effects of the change were an increase of roughly 34% in data entry production and an associated cost reduction.

Johnson said the bank had two broad objectives when it first installed its key-to-disk system. "We wanted major improvements in the quality of our work for our own bank and the services we sell to other banks. In addition, we needed more control of our production," he noted.

(Continued on Page 48)

CW Needs Your Output

Getting useful information into the hands — or eyes, or ears — of users efficiently will always be one of the major goals of DP. Since output is often one of the slowest aspects of DP operations, it is among the most challenging, important problems users face. If you have met this challenge, here's your chance to tell other *Computerworld* readers how you did it.

"Computer Output Equipment" will be the theme of a special report to appear in the Feb. 26 issue of CW.

We want to hear from you. Are you using plotters or graphics in your operation? How about voice-output, microfilm or color graphics CRTs? Have you found a better output method?

Contributors should send us about four typewritten, doublespaced pages describing the problems they faced, how they handled them and what results they got. Articles or questions concerning them should be addressed to Howard A. Karten, Computerworld, 797 Washington St., Newton, Mass. 02160 (617-965-5800). All material must be received by Jan. 10.

System Axes Time Involved In Processing Union Benefits

UTICA, N.Y. — At least one union here is not worried about automation and has in fact turned to computers in order to serve its membership better.

"Computers are basic business tools that pay off in efficiency and cost savings. They are neither frivolous nor a luxury," according to Joseph C. Talarico, president of Amalgamated Meat Cutters, Butcher Workmen and Affiliated Crafts of North America, District Union Local No. 1 here.

Talarico says that all of Local 1's computer programs are keyed to the goal of making the union more responsive to its members.

Twenty-three Honeywell, Inc. 7760 CRT terminals are on-line to a Honeywell Level 64 computer at the union headquarters primarily to permit fast information retrieval.

But more important than the speed provided by the system, Talarico said, is the fact that all the information regarding a union member's benefits status is current and accurate.

Talarico sees Meat Cutters Union Local 1 as a trend-setter. "As far as we know, we are the only union our size that has totally computerized its operation in-house," he said. "We're able to offer a full range of progressive services to our members only because of our efficient computer system."

Talarico credited Local 1's DP manager, Mark S. Stone, with originating and developing the complex, efficient array of pro-

(Continued on Page 44)

VA Opens DP Center

Max Cleland (in wheelchair), administrator of veterans affairs, and W.R. Martin (right), assistant administrator for data management and telecommunications of the Veterans Administration (VA), inspect the computer room of the VA's new Hines DP Center in Maywood, Ill.

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Union Axes Time-Consuming Processing

(Continued from Page 43)

grams used to solve management problems as well as to serve the 14,000 union members.

Talarico initiated Local 1's credit union five years ago when he was vice-president. That was before the computer. "It took us weeks to prepare quarterly reports for 1,000 members," he said.

Memberhip Boom

But with Stone's arrival in 1975 and the union's initial lease of the Level 64, membership grew rapidly. In the last five years, Local 1 has had the fastest growth rate of any credit union in the Northeast — and one of the fastest in the country, Talarico said. Today, nearly half of Local 1's 14,000 members belong to its credit union.

"Because of the efficiency of our computer operation, we can compete with all the local banks serving our members, who are spread out in 47 counties in three states," Talarico said. Checks go out the same day as share withdrawal requests are phoned in, and loan checks are mailed the same day the application arrives in Utica. "We've been able to offer new-car loans at 8% when banks were getting 10% to 11%, and used car loans at 9% when banks get 18%," he said.

Up-to-date quarterly reports are now generated on the Level 64 in a few hours. Year-end statements were in the mail to 7,000 members by Jan. 4, Talarico noted.

Money Refunded

Another benefit Local 1 offers its union members is reimbursement for prescription drugs. When the union went "self-insured" — rather than having an insurance company underwrite the program — Stone designed the claim form so that it serves also as a keying document. All information that needs to be keypunched is shaded on the form. "It makes the job fast and easy for our keypunch operations," he said.

Safeguards were built into the computerized drug-check issuing procedure to ensure that a check cannot be written for a fraudulent claim.

Another member benefit, which Talarico calls a "first in our industry and one of the first in the country on this scale," is a prepaid legal plan. Totally self-funded through employer contributions, the plan allows members a specified number of hours of free legal counsel for wills, house purchases, estate planning and so forth.

"The secret is running the union like a business. I'm responsible for management of our dues-payers' money," he said. "I use the computer to provide member services and to provide myself with information I need to make intelligent management decisions."

Apparently he does it very well. Local 1 has been rated in the top .5% in the country in terms of investment performance.

President Talarico called Stone to his office one day and said, "I'm thinking of offering a maternity benefit program for part-time employees. What is our potential liability?" In four hours, Stone had the report on Talarico's desk.

Stone has a penchant for neatness. His keypunch cards are color-coded to avoid possible confusion. For example, cash cards have a blue stripe on the edge, claims processing have green, and credit union checks are red-coded. Batch cards and job cards are coded with the same color.

His documentation is neatly organized in three indexed volumes. Complex checks and audit controls are built into each program. His rerun rate? "About 10 a year," he said.

Local 1 owns its Level 64 with 256K bytes of main memory, three MSU 4000 disk drives, 23 7760 CRTs, four tape processors, a 1,200 line/min printer and a 1,050 card/min card reader.

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	Display set deep in hood to reduce glare	Yes	No	No	No	No
	Full 24 x 80 display	Yes	Yes	Yes	Yes	Yes
	Full upper and lower case	Yes	Option	No	Yes	Yes
	Non-glare screen	Option	Yes	No	Yes	Yes
High operator throughput, low operator fetigue	Teb stops/tab key	Yes	No	No	Yes	Yes
	Backspace key	Yes	No	No	Yes	Yes
	Repeat key	Yes	Yes	No	No	Yes
	Shiftlock key	Yes	No	No	No	No
	Separete print key	Yes	No	No	No	Yes
Convenient switching Local/on-line	Locel – remote key	Yes	No	Option	Option	Yes
International Character sets	French/German/Swedish/Danish/British/Spanish	Option	Option	No	Option	Option
High speed numeric	Integrated numeric pad	Yes	Option	No	Yes	Yes
Convenient system interfacing	RS-232/CCITT-V24	Yes	Yes	Yes	Yes	Yes
	Current loop	Option	Yes	No	Yes	Yes
Simplified progrem debugging	Transparent mode end displeyable control characters	Yes	No	No	No	No
Faster maintenance	Self-test	Yes	No	Yes	No	Yes
Minimum desk space	Small size	15Wx 19Dx 14H	15.5Wx 20.2Dx 13.5H	15.5Wx 20.5Dx 13.5H	15.5Wx 20.5Dx 13.5H	21Wx 23Dx 14.5H
Printer port	Printer port	Option	Yes	No	Yes	Option
Cost effectiveness	Qty. 100 OEM price	$599†	$740	Less then $550 in quantity 1000	$860	$895

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Imaging Meet Planned

BOSTON — The Institute for Graphic Communication, Inc. will present a conference on "Imaging Industries Over the Next Decade: Trends, Opportunities, Threats and Forecasts" on Dec. 3-5 at the Andover Inn in Andover, Mass.

The conference will discuss digital hard-copy printers, extended reprographic systems, multifunction terminals and automated prepress systems, a spokesman said.

Sessions will include such topics as "Impact of Major Trends on the Next Decade of Imaging," "Electronic Threat to Conventional Photography and Imaging" and "Forward March of Façimile and Electronic Mail."

Further information can be obtained from the institute at 375 Commonwealth Ave., Boston, Mass. 02215.

Runs at 1,000 Line/Min

Printer Extends Chaintrain Line

MALDEN, Mass. — Data Printer Corp. has announced an addition to its printer family, the Chaintrain Model 1210, which it claimed offers a 1,200 line/min printer's features for the cost of a 1,000 line/min printer.

Using a horizontal moving font line technique, the 1,000 line/min printer is said to provide precise vertical print alignment. A 64-character print set is standard on the device, and character sets of 48, 96 and 128 characters are optional.

Full Line Buffering

Full-line buffering is also provided on the microprocessor-controlled unit, the company indicated, and the unit can accept six-part forms from 3.5- to 19.5 in. wide. A motorized upper and lower tractor aids in precise print alignment.

The Chaintrain 1210 costs $14,675. A free, 30-day in-house trial is available for interested parties, the company said from 99 Middlesex St., Malden, Mass. 02148.

High End Added To Taurus Series Of Badge Readers

LAMBERTVILLE, N.J. — Taurus Corp. has added a high end to its series of hand-operated, self-contained badge and card readers without moving parts. The solid-state unit can be easily interfaced with a wide range of host systems, a spokesman claimed.

The Model H-68 is capable of reading up to 68 standard card columns. An optical reading system using infrared LEDs and the absence of moving parts are said to contribute to a long product life and minimum maintenance.

Units Can be Customized

Available as a free-standing or panel mountable unit, the H-68 and the other three models in the series can also be customized by the company, the spokesman noted.

Readout on the devices is column-serial and row-parallel. Various forms of output formatting including bit-parallel, Ascii and Teletype code are available.

The devices sell for $375 in quantities of one to 24 and $295 in multiples of 100, Taurus said from Academy Hill, Lambertville, N.J. 08530.

Scopus Unveils Short-Reel Tape

LOWELL, Mass. — A lightweight, short-footage reel of computer magnetic tape recently introduced by Scopus Corp. fits the hubs of all standard tape drives and weight 3.5 oz., according to the company.

Use of the 150-ft, 4.5-in.-diameter Mini Reel results in lower mailing and shipping charges, a spokesman said.

The Mini Reel comes with a styrene cover and costs $4.35, the company said from 710 Chelmsford St., Lowell, Ma. 01851.

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Technical Director

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It is this kind of technological leap that's led National to enter the computer systems market. We figure that as long as we're generating system level technology, it makes sense to produce full computer systems as well.

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Before ever introducing a computer product, National wants to be certain of one thing—that it serves its intended customer. One way of guaranteeing this is to make sure the product answers as many user problems as possible. And since we're not hooked into obsolescent methodologies or designs, we can do that very well.

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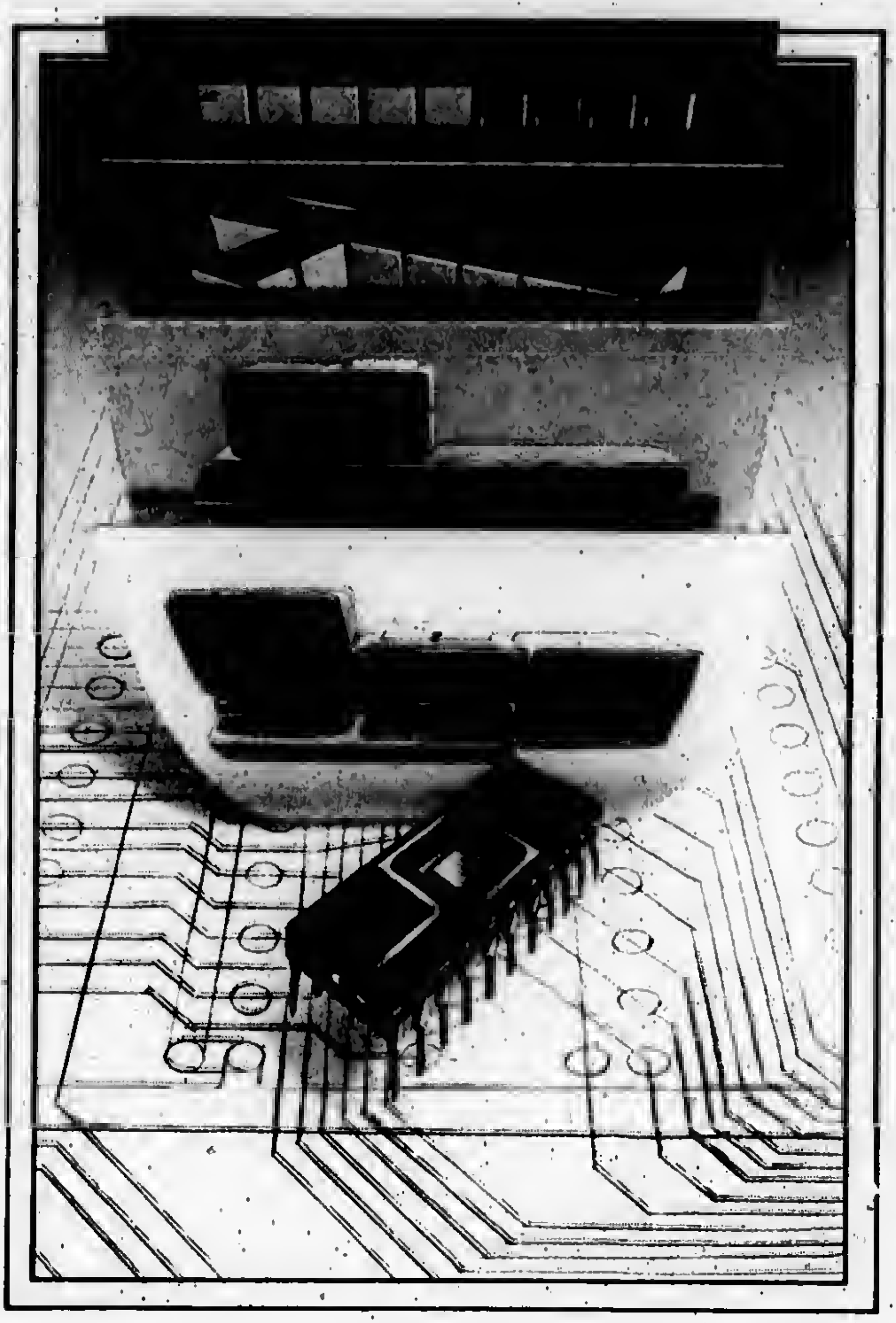

And not only do we build add-on memory systems, in many cases we build the IBM-equivalent mainframes to which they attach. This means we can design even the most minute components to carry out incredibly specific tasks in highly-integrated systems of our own making. As a result, customers get degrees of performance, reliability and price they won't find anywhere else.

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If there's more I can tell you about National Semiconductor, and the directions we'll be taking in the next ten years, I'd be glad to fill you in. Write me personally: Pierre Lamond, Technical Director, National Semiconductor Corporation, Drawer 19, 2900 Semiconductor Drive, Santa Clara, California 95051."

Computer Products Group
National Semiconductor Corporation

Bank Personnel Cash in Using Key-to-Disk

(Continued from Page 43)

Immediately after the bank installed the equipment, Johnson collected production statistics for a period of two months, without mentioning this to the data entry supervisors. These statistics, including error rates and hourly keystroke rates, have been incorporated into a production standard.

Operators receive additional pay when they top the standards, and a worker's pay is calculated by a statistics package on the mainframe and reported to each operator on his weekly report.

Johnson said the operators reacted favorably to the production/pay plan. "Now the operators set goals for themselves, and since those goals are backed up by money incentives, there is something to work for," he said. "And we don't mind paying the extra salary when we have top-quality operators who are worth it."

In addition to increasing production and efficiency, the statistics package eliminated some of the bank's personnel problems.

"In the past, salary reviews were based on performance evaluation made by the key entry supervisor," Johnson stated. "If an operator didn't agree with that evaluation, we had the potential for conflict.

Variations in Difficulty

Johnson acknowledged that not all data entry jobs are equally demanding. In particular, he noted, jobs with a lot of alpha information, or ones with smaller input forms, are more difficult. To account for these differences, such jobs are weighted at 1.5 times the actual keystroke rate; thus, an 8,000-stroke "difficult" job is considered equivalent to a 12,000-stroke "easy" job. This means such jobs are no longer shunned, Johnson indicated.

The bank is using an 11-station System 1200 key-display system from Mohawk Data Sciences of Parsippany, N.J. The 48K-byte configuration also has a 1,600 bit/in. tape drive and automatically collects statistics as each job is done.

Linda Williams, data entry supervisor, said that operators adapted easily to the system. "All they have to do is follow the instructions of the prompting display. . .even though we had a lot of support from the vendor, we were able to do most of the training ourselves."

In mid-1977, the bank developed a statistics package to allow the system to collect more data and thus give it greater control over production. As a result, it now has access to a breakdown of each operator's production as well as overall production reports.

Monthly and weekly reports show any work that was not verified, an analysis by operator and an analysis by each individual key entry source document.

Using the information, the bank redesigned the layouts on the key entry source documents for three major applications totalling 25% of its data entry volume.

"We have absolute control over our production," Johnson said, "and we have unbiased information on which we can evaluate a key entry operator's performance.

"In addition, each operator's work is broken down so we know his or her strong and weak areas," he said. "We give this report to each operator so he can take advantage of this information.

"With thie refinements of our operations and the production/pay plan, our overall key entry productivity jumped 34% in six months," Johnson said. "Our overall shop average is much more than 12,000 keystrokes per hour."

Johnson cited the customer loan application form as a prime example of the bank's former production problems. "We tested our best operators and they could not break 10,000 keystrokes per hour," he said. "We found that the input was in a difficult sequence for our operators to key.

"The form was rewritten and the data entry formats redesigned — and now our average production for that job is more than 14,000 keystrokes per hour," he said. "Many of the improvements in key entry forms and procedures are accomplished with no software changes of any kind on the mainframe. For example, one feature of the system allows operators to enter data in a format that is different that the actual physical layout; the system then automatically reformats the data when it is dumped to tape," he explained.

The bank has no immediate plans for upgrades. "We are now enjoying the benefits of the equipment," Johnson said. "Our production is up and the error rate is the lowest we have ever experienced. In addition, we know exactly what is being done.

"Finally, we have a pleasant work area with no noise, and the operators are happy and working fast, but accurately, to take advantage of the production/pay plan," he said.

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NEW ORLEANS — When E.R. Squibb and Sons, Inc. decided in 1974 to convert from IBM 360/20s at nine branches to a minicomputer-based distributed data processing (DDP) system, much of the needed hardware and software was unavailable from vendors, according to Joanne Finch, manager of the Minicomputer Services Department at Squibb.

Difficulties arose from the lack of vendor products and the time it took central site batch programmers to grasp the nature of on-line systems. Despite these problems, the Squibb system was implemented only eight months late and is now performing well, she told a workshop at International Data Corp.'s recent conference on DDP here.

Finch advised users considering conversion to DDP to select a vendor carefully and to interview other users since they may provide excellent guidelines. One should also be sure that plans apply to the company's needs and that technical compatibility requirements — for example, terminals interfacing with operating systems — are met.

Design Changes

Systems are not always static in design, and Squibb's scheme was no exception. The original plan called for replacing the 360/20s at the nine branches — which provided on-line order entry — with Digital Equipment Corp. PDP-11/40s.

The nine branches would be restructured into five branches and four satellites. Thus the new plan bore little resemblance to the original one.

While the changes were being made, the users at the branches decided it would be advantageous to expand the scope of the systems' jobs, so the plan was changed to five PDP-11/70s, each with 512K bytes that would send daily updates via IBM 2780 emulation to the central 370/155.

Meanwhile, Squibb had set up a task force with a representative user who provided valuable input and kept the users at the branches involved. While the project did not determine when it would freeze specification changes, it did try to keep on top of vendors' developments.

Series of Problems

Some of the problems Squibb encountered appeared major, but whenever something was not available from a vendor, the Squibb DP department tackled the task. Often this amounted to a dead end because a vendor would offer an equivalent product by the time the Squibb team devised its solution.

In many cases, Squibb preferred vendor offerings that would not require in-house support.

In retrospect, Finch thought the project could have been finished in the same time frame if it had been started a year later.

The Squibb plan was committed to the DEC RSTS operating system, but that didn't support remote printers, so Squibb had another problem with which to contend.

Finally it learned DEC was coming out with a bisynchronous printer supported by RSTS. However, Squibb's whole system was based on asynchronous transmission, so it persuaded DEC to make some asynchronous versions.

After an effort by Squibb to solve the lack of error correction capability on the lines to the printer, Codex Corp. came out with the solution: an intelligent multiplexer, the 6030. Prior to the Codex product, Squibb had developed a microprocessor-based device.

In 1974, there was no Cobol; there were no DEC VT52 CRTs, which Squibb wanted. After looking at terminals offered by different firms, Squibb opted for Infoton Corp. units. At the time, Infoton had its own maintenance force, but it no longer does. When Squibb changed its plan from a PDP-11/70 at each site to only five sites, DEC did not want to maintain its gear — printers that were in the satellite sites without CPUs, for instance. In addition, the purchase discount changed because of a fewer number of CPUs, Finch noted. So at one time Squibb didn't know what the total cost would be.

Inadequate Throughput

Software was a problem, too. Squibb got its applications done in time, but the throughput on the system for its order entry application was inadequate, she said.

Squibb had to wait a few months until DEC released Basic Plus II. Squibb helped debug it and now gets the throughput it desires, with each order entry taking less than 1.5 min.

Despite the problems, the system is up and running, and it looks like it can be easily expanded.

The system's hardware cost about $2 million and its software about $1 million. About 20 man-years of effort went into the project, Finch noted.

Squibb's biggest oversight was its failure to realize that RSTS wasn't commercially oriented. It was too easily saturated by similar applications, such as the various procedures in data entry, with operators trying to get at the same files at once, she explained.

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System Helps Keep Store Shelves Well-Stocked

NEW YORK — Korvettes, Inc., a large retailer headquartered here, is using a computerized distribution system to speed movement of incoming merchandise from warehouses to its stores in this area.

.The system, written by Datamor, the company's DP subsidiary, has helped the company significantly shorten the time required to get merchandise where it is needed.

Korvettes' On-Line Merchandise Management and Distribution (Kommand) was designed to facilitate the receiving, processing and distribution of materials, according to Datamor President Morton Weitz. "Management found it was losing two to seven days in the process of receiving and distributing merchandise from the warehouse and distribution center. It was agreed that we needed a system that would enable the warehouse to turn merchandise around quickly in its limited space," Weitz said.

"The system was also designed to eliminate paper handling steps, the main cause of our problem, as well as to ensure accuracy," he continued.

Korvettes uses an IBM 370/158 running under MVS with 5M bytes of memory. This system is linked via phone lines to IBM 3277 CRTs in the company's warehouses in New Jersey and Long Island. In addition, the system is linked to Four-Phase Systems, Inc. minicomputers, which print shipping labels and price tickets for the incoming merchandise.

"With 95% of Korvettes' soft goods and 80% of the store's hard goods routed through the Bayonne warehouse, distribution operations were one of management's greatest concerns," Weitz noted. The system was developed to ensure distribution "within our goal of 12 to 24 hours after all merchandise is received," he added.

Initial Functions

The system first comes into play when a buyer at the company's Manhattan headquarters generates a purchase order. The order is stored in the system until the shipment arrives at the warehouse, when the receiver can verify that it is correct and notify the home office of its arrival.

If the merchandise has been predistributed, it can be received, ticketed and distributed to the stores within three hours. Otherwise, the warehouse notifies the appropriate home office merchandising staff of the arrival, and the staff can then furnish the warehouse with instructions for distributing the goods.

This process eliminates the time lag that had been required when buyers were notified via hard copy.

In addition, Weitz noted, "the transcription of information and the possibility of error has been dramatically reduced."

Mike Berenson, senior vice-president and general manager of Datamor, added that the system has helped Korvettes "by improving home office and warehouse communications. By knowing when merchandise is scheduled to arrive at the warehouse, eliminating the search for purchase order documents and scheduling the carriers in an appointment routine, Korvettes is now able to move merchandise immediately."

Berenson added that the system could allow Korvettes to have the incoming merchandise delivered directly to individual stores if Korvettes wanted, but that centralizing the operation is cheaper for the company. In addition, the use of the computer gives the buying staff and management significantly greater control over buying and shipping of merchandise.

How has the system worked? "We are accomplishing our objectives while processing about 20% more merchandise through our existing warehouse structure," Weitz said.

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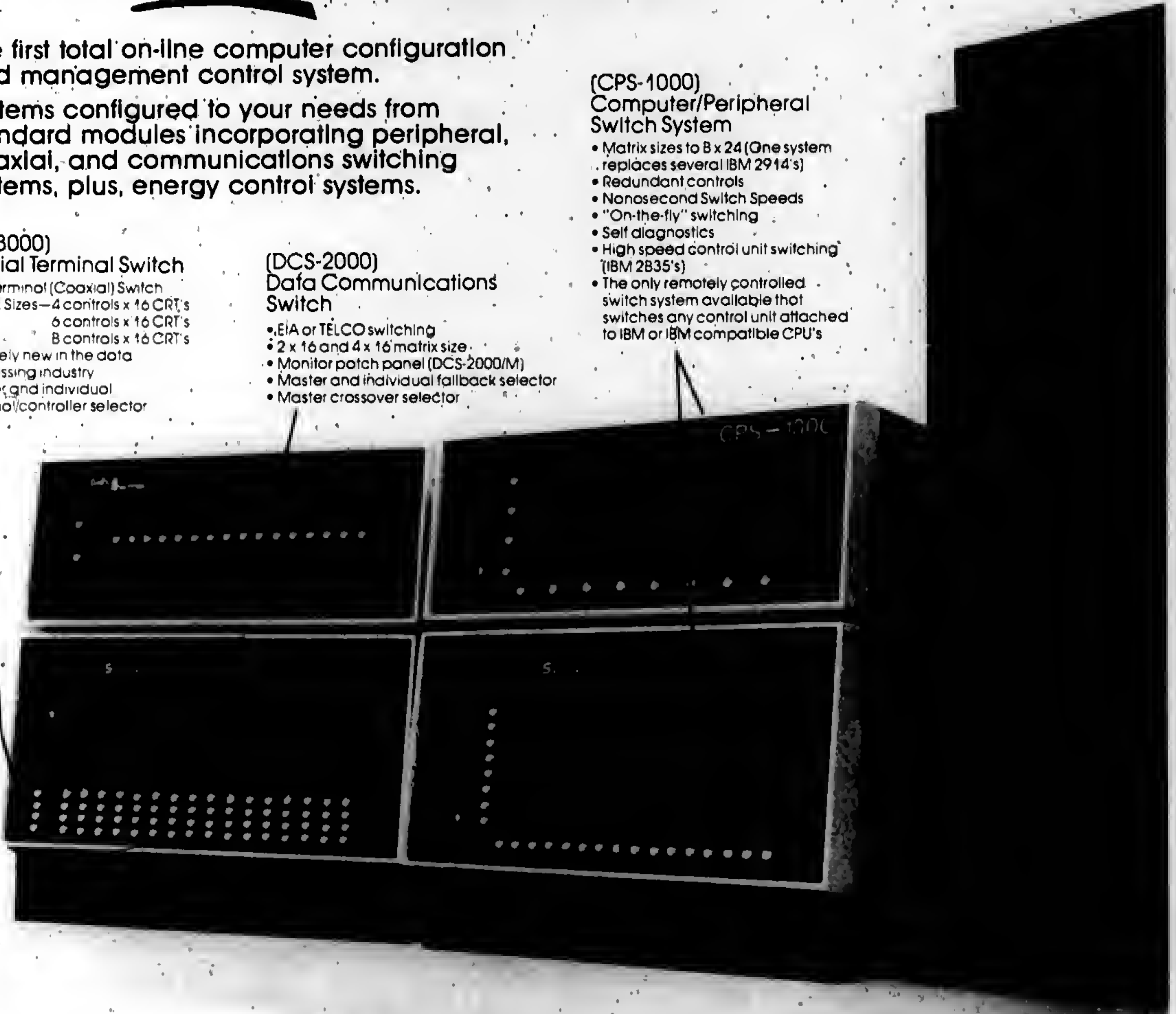
- CRT Terminal (Coaxial) Switch
- Matrix Sizes—4 controls x 16 CRT's
  6 controls x 16 CRT's
  8 controls x 16 CRT's
- Uniquely new in the data processing industry
- Master and individual terminal/controller selector

(DCS-2000)
Data Communications Switch
- EIA or TELCO switching
- 2 x 16 and 4 x 16 matrix size
- Monitor patch panel (DCS-2000/M)
- Master and individual fallback selector
- Master crossover selector

(CPS-1000)
Computer/Peripheral Switch System
- Matrix sizes to 8 x 24 (One system replaces several IBM 2914's)
- Redundant controls
- Nonosecond Switch Speeds
- "On-the-fly" switching
- Self diagnostics
- High speed control unit switching (IBM 2835's)
- The only remotely controlled switch system available that switches any control unit attached to IBM or IBM compatible CPU's



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Hewlett-Packard Computer Advances

Thin film technology:
The HP2621P
printing terminal

Innovations in
dot matrix printing

System 35 desktop
computer

HP does it with dots

Hewlett-Packard has advanced the technology of dot matrix printing with a line of thermal and impact printing products that are both flexible and reliable, and offer good price/performance ratios.

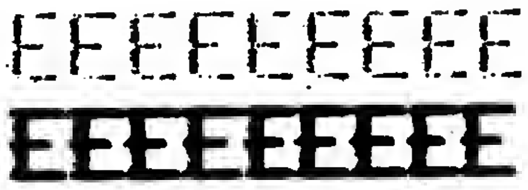
The flexibility to place dots in any arrangement means that multiple character sets can be developed—and graphics can be printed with high quality and accuracy. A matrix of dots can be used to describe virtually any character set or graphic display including: diagrams, subscripted and super-scripted print, graphs, charts, super-size print, labels (at any angle), and special decorative effects.

Hot dots

In thermal printing, characters in the form of dot matrices are inscribed on heat sensitive paper by energizing the resistors on a printhead. Inherent in this process, however, is the problem of overheating the resistors. When they become too hot, the letters smear.

To print the first dot, a resistor is heated with that amount of energy required to heat a completely cooled resistor. After the dot is printed, the resistor cools, for example, to approximately 75% of the original energy level. To print the next dot, the resistor is fired up again. It is now at 175% of the original energy level and getting hotter by the dot.

There can be problems in high speed thermal printing:



The HP2621P prints 2160 dots per second. Yet, by using a microprocessor to control resistor heating and cooling, print isn't light or smeared.

Uncontrolled, the process can continue and continue until the resistor eventually becomes so hot that the print begins to smear.

Hewlett-Packard's HP2621P thermal printing terminal meets this challenge with two innovations—controlled resistor energizing and efficient printhead cooling.

Controlled dot energizing

The HP2621P's microprocessor enables rigid control of the amount of energy given to a sequence of dots to ensure clear, crisp printing. After a dot is printed and the resistor cools, it is heated to a reduced energy level—just enough to print the next dot, not enough to smear it.

Specifically, we give the first dot of a sequence an extra amount of energy to allow full dot development. Subsequent dots are given only enough energy to maintain high-quality print.

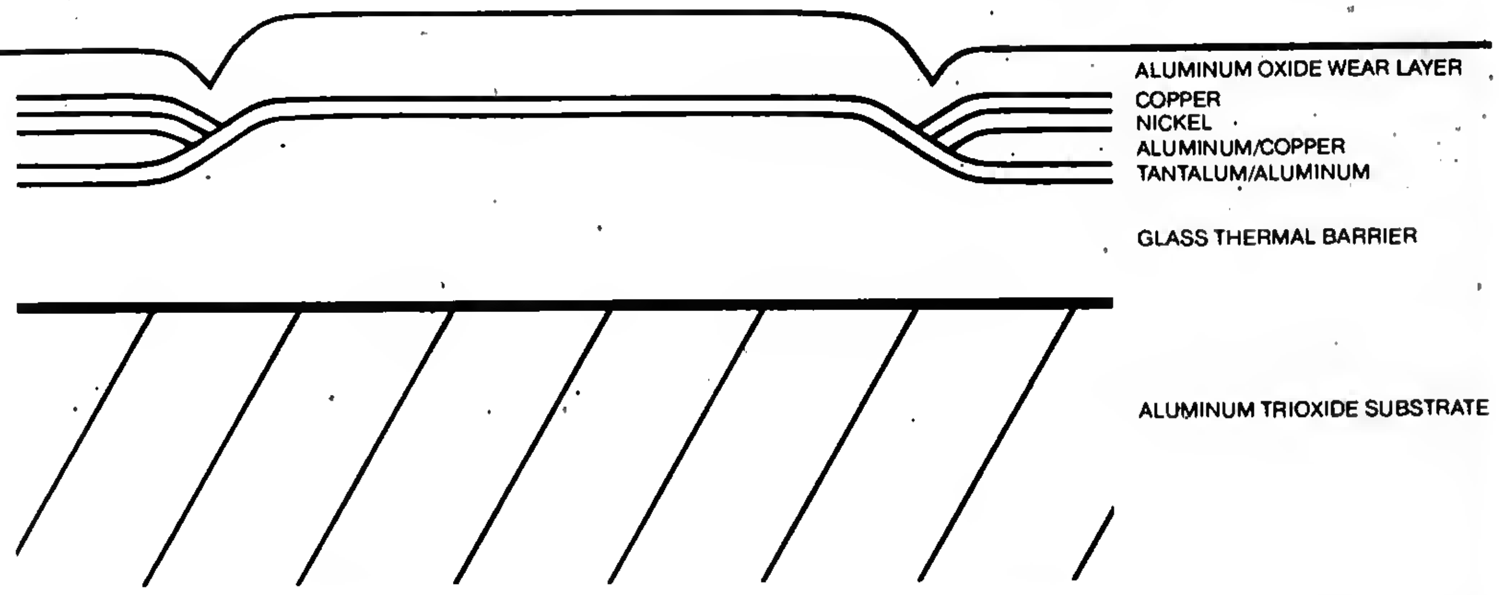
Cooling glass

Many years of experience in thin-film technology have helped us develop a printhead which ensures not only effective resistor heating but cooling as well.

The HP2621P printhead is composed of multiple layers of conductive and resistive materials applied to the printhead surface through an innovative magnetron sputtering system. In addition to these layers, there is a glass thermal barrier. The relationship between the resistive/conductive layers and the thermal barrier's thickness is crucial to heat

◀ Cover

The innovative thin film printhead of the HP2621 is shown greatly magnified on our cover, and here as a diagram (not drawn to scale). We have implemented an exceptionally thin glass thermal barrier to optimize heat transfer and enable clean, clear printing, even at speeds of 120 characters per second.



transfer. Too thick a barrier and the resistors are hard to heat. Too thin a barrier and too much heat escapes. The HP2621P utilizes an exceptionally thin glass barrier to promote the efficient heat transfer so essential for clear, high-speed printing.

Few moving parts

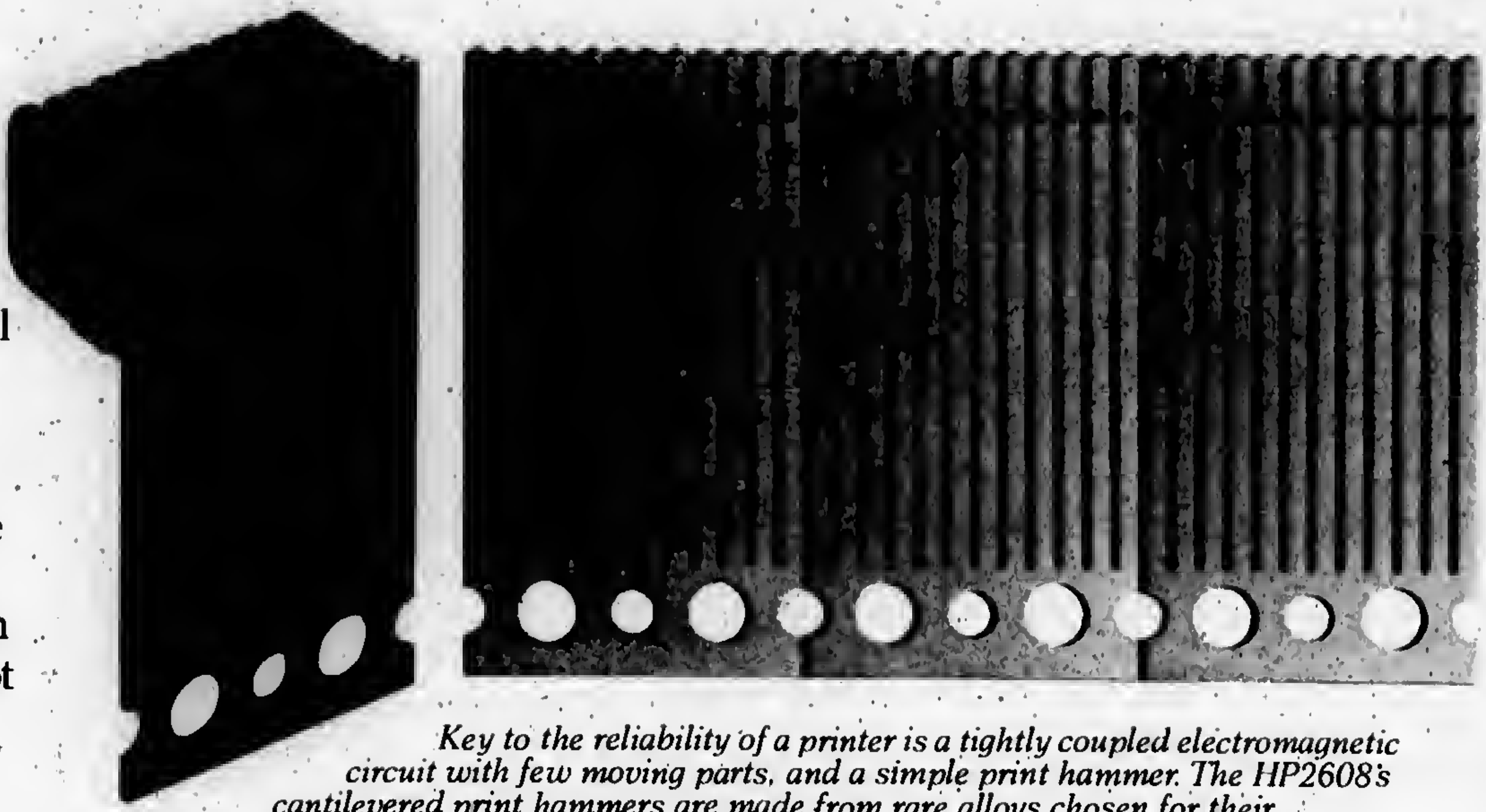
The HP2608 line printer is the result of a design challenge—to develop a highly reliable, medium speed line printer with precise dot positioning for graphics.

Typically, dot matrix printers have approximately 25% fewer parts than full-font character printers. The fewer moving parts a printer has, the greater its reliability. The high reliability of the HP2608 is achieved by a virtually frictionless print mechanism.

Ordinary printers rest the print bar on ball bearings and move it via stepper motors. The HP2608 has a mechanically balanced print bar on stainless steel springs or flexures. A voice coil linear motor moves the print bar back and forth.

The HP2608 has a virtually frictionless print mechanism.

An innovative concept in printers, this approach is drawn from well established technology in disc drives and audio speakers. The result—no rubbing parts. No ball bearings to wear out.



Key to the reliability of a printer is a tightly coupled electromagnetic circuit with few moving parts, and a simple print hammer. The HP2608's cantilevered print hammers are made from rare alloys chosen for their magnetic and stress qualities. For increased reliability, the print balls are securely soldered to the hammer using a proprietary HP microwelding technique.

Precision printing

To ensure high quality graphics, you need precision dot placement. The HP2608 has a cantilever beam print hammer and a drive coil for each of 132 character positions. During printing, each hammer is pulled back and released by an electromagnet. The hammer moves with a velocity defined by its resonant frequency.

To accurately position dots, all hammers must be driven at the same time. We use one drive pulse to guarantee simultaneous striking of all hammers. Printers which drive hammers individually have varied timing and dot placement.

Often, line printers produce characters and graphics that smear, ghost, or have light and missing areas caused by excessive vibration. We damp our hammers by placing a small, properly tuned spring behind each hammer and by using an electronic damping pulse. As a result, character ghosting and overstrikes are virtually eliminated.

Precision graphics require precision tooling. We maintain exceptionally tight mechanical tolerances on machined parts—tolerances usually found only on higher priced printers.

Specially selected alloys are used in the construction of the HP2608. Chosen for their magnetic and stress qualities, these metals give additional durability and reliability to the printer parts. Tungsten carbide, an extremely hard element often used for high speed cutting tools, is used for the head or ball of the hammer. The cantilevered print hammer beam itself is made from an alloy selected for its magnetic traits. HP uses an innovative microwelding technique to bond these alloys together to form the hammer.

For more data on the HP2621 and HP2608, check A and B on the reply card.

The one-stop shop for terminals, printers, systems

HP2621

All too frequently low-cost character mode terminals mean a disappointing lack of capability. Not so with Hewlett-Packard's new interactive HP2621 terminals. These teleprinter-compatible terminals are designed for interactive computer applications such as data inquiry, computer-aided instruction, program preparation and development, data access and update, and general time-sharing.

The HP2621 terminals have many of the features found on the successful HP2640 terminal family. All offer refreshed raster scan technology, high resolution CRTs, the full 128 ASCII character set, off-screen storage, and built-in editing functions.

Instant hardcopy

Until now, getting a permanent record of your terminal activity was often expensive and inconvenient. Printers sometimes cost more than the terminals to which they are connected. In addition, if several terminals shared a printer, you may have had to wait for access to the printer and then walk to another area to pick up your print-out. Not any more. Since the HP2621P terminal has an integral, compact thermal printer, hardcopy is available where and when you want it.

There are advantages to integrating a printer and terminal. Both can share the same power source and the same housing. This reduces our costs—which keeps your price low. And thermal printers are quiet—suitable for a variety of work environments.

120 char/sec

The HP2621P prints fast—120 characters per second. It can print twenty-four full 80-character lines bi-directionally in less than 18 seconds. To do this, HP uses a smart carriage return—a known technique for increasing printer speed. In addition to printing from left-to-right or right-to-left, a microprocessor automatically computes the length and last character position of the next line of text, and then prints that line in the fastest, most efficient direction. A typical page of text prints in 10-12 seconds.

Seeing double? HP's low cost, character mode terminals, the HP2621A and the HP2621P, are nearly identical. The difference? The HP2621P has instant hardcopy.

Reliability and high resolution

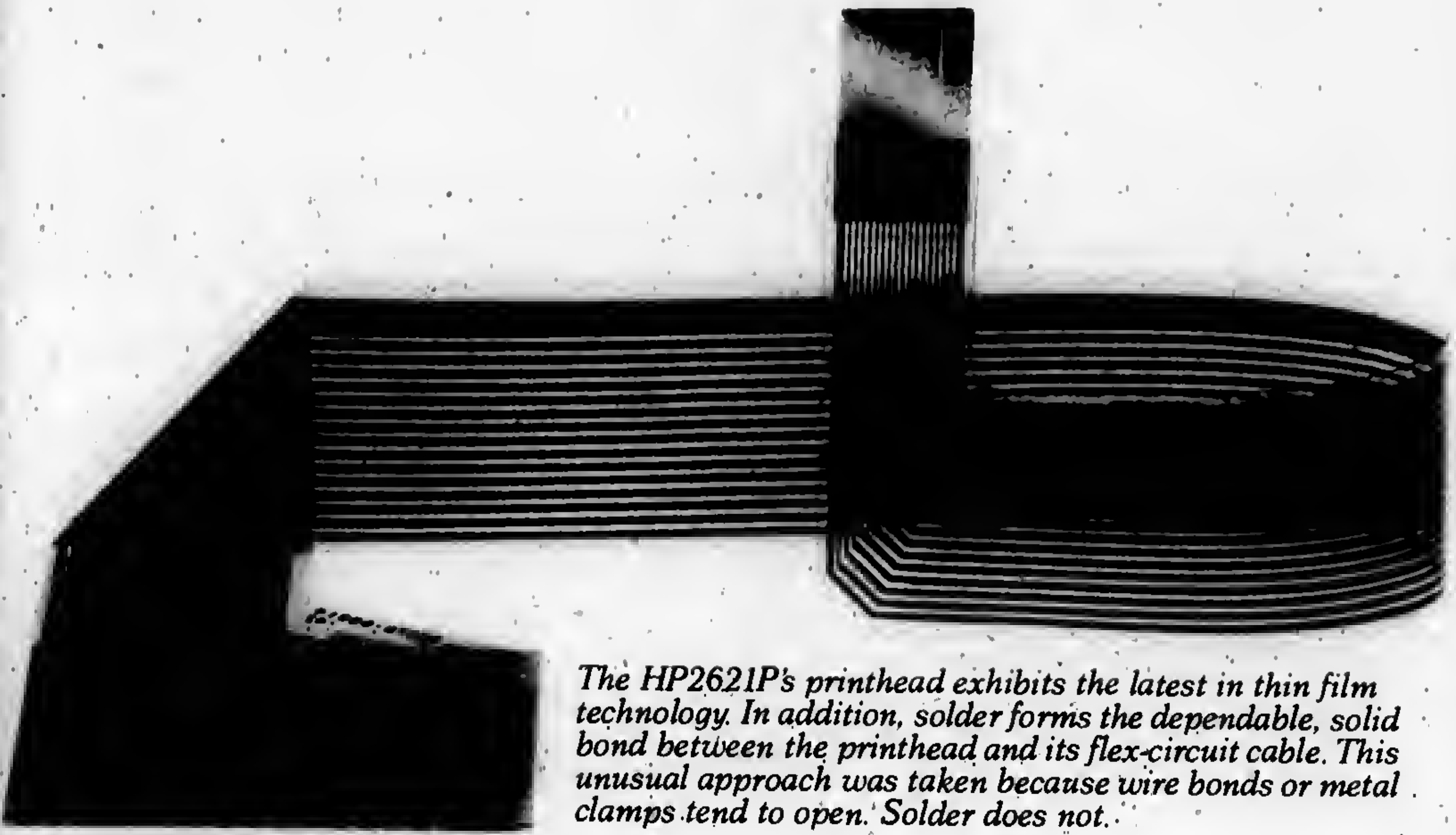
A potential cause of printer failure is the printhead/flex-circuit cable connection. Typically, printheads are attached to cables by wire bonds or metal clamps that tend to open up. Solder forms a more dependable, solid bond. On the HP2621P, the long-life printhead is soldered firmly to the cable and typically can withstand three pounds of 90 degrees vertical pull as well as a 10 pound tensile lift.

Both the HP2621A (no printer) and the HP2621P use high resolution CRTs of the same quality as our popular HP2640 family.

High resolution results from a 7x9 dot character matrix within a 9x15 dot character cell. In addition to better character definition, this 9x15 cell size provides for descenders on lower case letters and a character-by-character underline. Readability improves from wider spacing between characters and rows.

Two-page memory

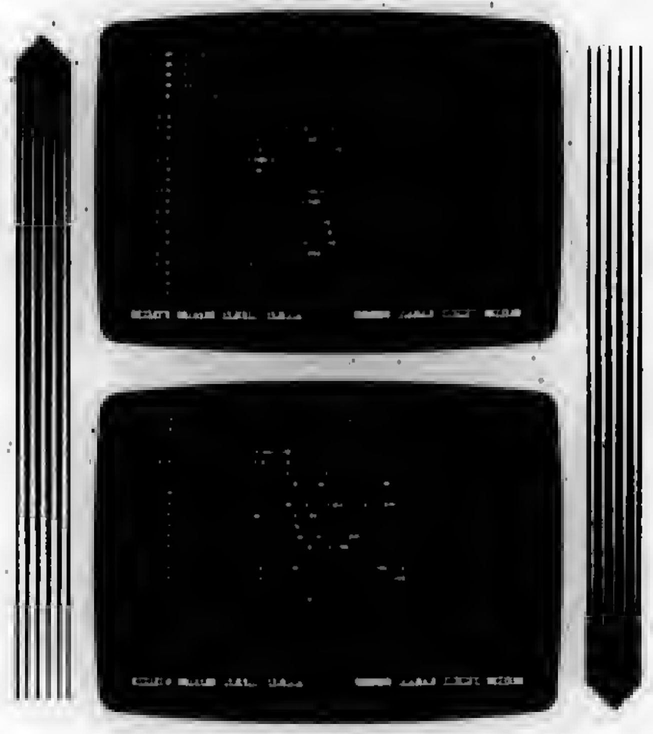
The HP2621 terminals can store up to 48 lines (two full pages) in its 4K bytes of display memory. In



The HP2621P's printhead exhibits the latest in thin film technology. In addition, solder forms the dependable, solid bond between the printhead and its flex-circuit cable. This unusual approach was taken because wire bonds or metal clamps tend to open. Solder does not.

text generation and program development, the ability to conveniently view 24 lines, either page-by-page, or by scrolling, line-by-line, can save time and reduce errors.

The HP2621 terminals add local editing to interactive applications.



Scroll up and down through a full two pages of memory with the new HP2621 terminals. This convenience saves programming time and reduces the potential for errors.

Neither requires software development or modification on most systems.

With line mode, each line of data from the keyboard is buffered for editing until the return key is pressed. Because these terminals can distinguish between data sent by the computer and keyboard entered data, operators can locally edit replies to computer generated questions. Only desired data is entered. In modify mode, any line in the terminal's 48-line memory can be edited and then retransmitted without retyping the entire line.

Interested in a low-cost data inquiry terminal for interactive applications? The HP2621A sells for $1450* while the HP2621P sells for $2550.* **For more details on the entire family of data terminals, check C on the reply card. Check A for the HP2621.**

Impact Printing

Hewlett-Packard recently introduced three new dot-matrix, impact printing peripherals: the HP2608 line printer, the HP2631G serial printer, and the HP2639 serial printing terminal. Because they use dot matrices, there is virtually no limit to the number of character sets that can be defined for the printers now or in the future. Among current offerings are character sets for most European languages, Arabic, Cyrillic, Katakana, and line drawing.

Reliable and convenient

The use of microprocessors in these new products means fewer electronic components and fewer high-priced mechanical parts. And that means greater reliability.

Plus, we put our impact printing products through rigid environmental and reliability verification tests (RVT). Randomly selected units from inventory are operated 24 hours a day, five days a week for the equivalent of one full year's average usage each. Results are documented in our RVT brochure. **If you want to see what punishment these products can take, check D and we'll send you a copy.**

Our new printing peripherals use a long-life, mobius loop ribbon cartridge. To change ribbons, just pop out the used cartridge and drop in a new one. No mess. No inky fingers.

HP2608

Designed as a medium speed line printer, the HP2608 is capable of printing over two million lines per month at a rate of 400 lines per minute. And, the HP2608 has graphics capability.

Precisely positioned dots are printed in a matrix form with a density of 5040 dots per square inch. Dots can be placed anywhere on a page within 0.03 mm accuracy. A 10 by 13 inch page can be printed in less than 20 seconds.

System flexibility

HP2608 line printers can be placed almost anywhere they are

Continued from page 5.

needed—up to 1000 feet from a connected CPU. For applications with extremely large output requirements, several HP2608s can be used in a multiple printer approach.

Rugged, yet quiet

Rugged enough for EDP applications, yet quiet enough for most office environments, the HP2608 provides noise reduction and ease-of-use features usually found only on more expensive printers.

The HP2608's stand is completely lined with sound absorbent foam with special deep recesses around the access cover to keep the noise sealed inside. An optional sound cover is also available.

The stand holds printer paper and has storage space for extra ribbon cartridges. A paper tray is positioned on the back of the stand to hold printer output.

Paper alignment is easy. You can move the paper up and down electronically with one dot row accuracy, using either the guide on top of the printer cover or the precision forms alignment guide inside the stand.

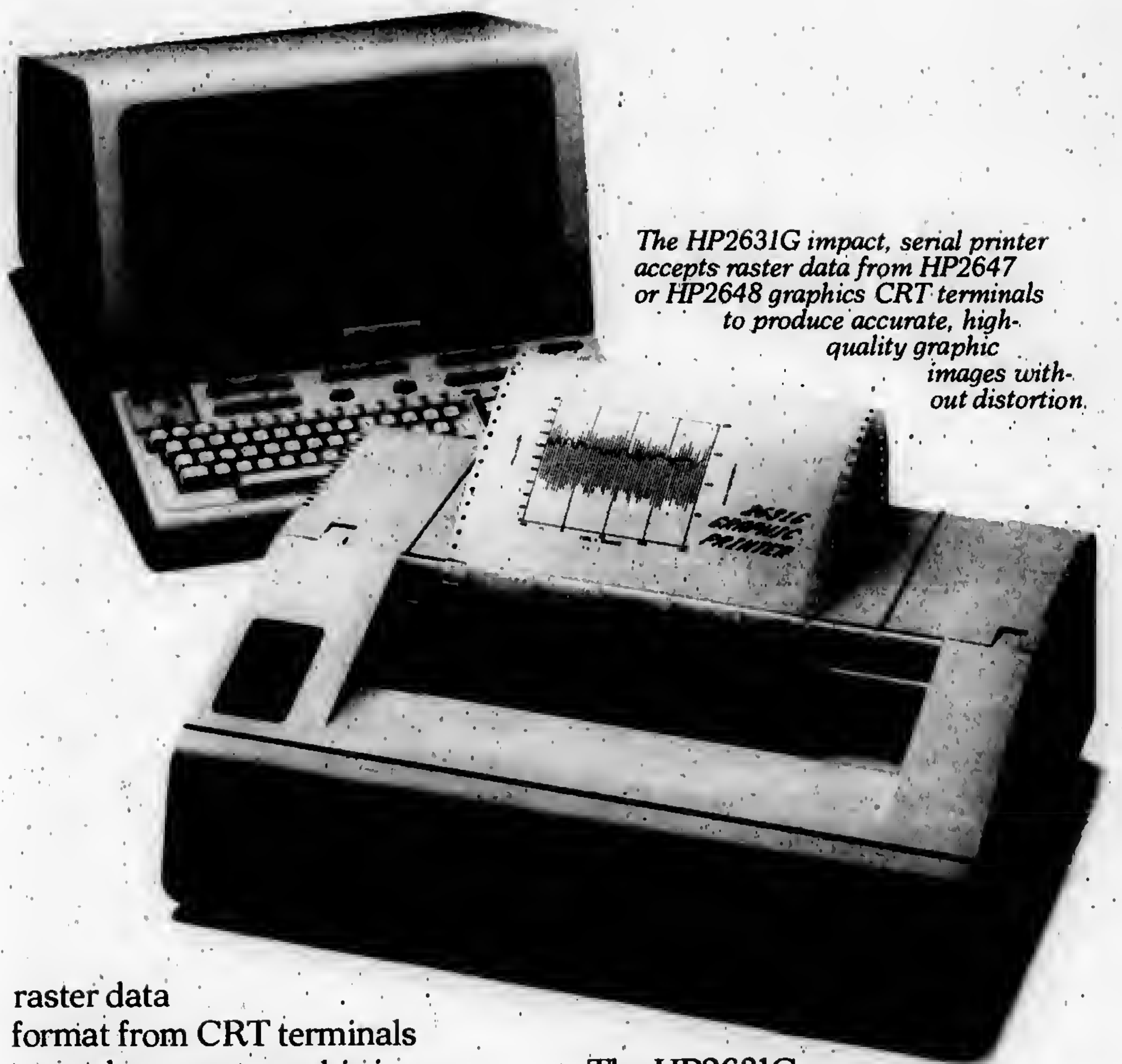
The HP2608 sells for $9250* **For more information select B on the reply card.**

HP2631G

The new 180 characters per second HP2631G serial printer has all the features of the popular HP2631A—plus graphics.

The HP2631G accepts HP's raster data format from CRT terminals to produce exact graphic images without distortion. In less than 50 seconds, a typical 10 by 5 inch graph can be printed from the screen of an HP2647 or HP2648 graphics terminal. There's even an optional high density character set which nearly doubles the horizontal dot density—providing greater character clarity with only 50 percent loss in print speed. You can programmatically select four print sizes, line spacing, and page/text lengths. Also, an automatic perforation skip mode can direct the printer to advance automatically to the top of the next page when the printing reaches the bottom of the specified text length. Forms up to 255 lines can be handled.

Interested in a high quality serial printer with raster dump graphics?



The HP2631G impact, serial printer accepts raster data from HP2647 or HP2648 graphics CRT terminals to produce accurate, high-quality graphic images without distortion.

The HP2631G sells for $4250.* **For details, check E on the reply card.**

HP2639

The HP2639 interactive printing terminal can be used with a broad range of systems in a variety of applications, and is specifically manufactured for OEMs and end users of non-HP systems.

The HP2639 provides all the features of the HP2635 printing terminal as well as a flexible, asynchronous, serial interface. It sells for $4205* complete with keyboard. OEM discounts are available. **For more information, select F on the reply card.**

*U.S. prices only.

Minicomputer power; desktop convenience

Don't be deceived by appearances. Under the guise of a desktop computer, the System 35 gives you all the power of a minicomputer. Its high performance, 16-bit parallel CPU has typical instruction times of less than two microseconds. Yet, processor, keyboard, memory, mass storage, CRT and printer are integrated so compactly that they fit neatly on the top of your desk.

Large internal memory

The System 35 features a surprisingly large internal memory. Up to 256K bytes can manage an array of 30,000 numbers with 12-digit precision. A wide range of interface capabilities make the system ideal for data acquisition and controller applications. It is fully HP-IB compatible* and supports a wide range of peripherals.

Language power

The System 35's major contribution to desktop computing is a combination of complementary programming languages—BASIC and Assembly language.

BASIC is an interactive language that is both simple to learn and easy to use. The System 35 runs standard ANSI BASIC and is enhanced with sub-programs, numeric array instructions, and multicharacter identifiers—features normally associated with FORTRAN and APL.

An optional Assembly language capability optimizes program efficiency in terms of I/O and computation speeds. You can significantly decrease application program run times by isolating those segments of a BASIC program that are potential bottlenecks and coding them instead as an Assembly language sub-program. Certain specialized computations and I/O operations may actually be executed as much as 100 times faster in Assembly language.

Rapid Assembly

You can enter Assembly language source code through the keyboard as part of a BASIC program. Each line is checked syntactically the instant it is stored in memory. The ROM-based assembler performs at the rate of 1000 lines per second: turnaround is practically instantaneous.

The System 35 provides automatic editing capabilities which enable you to enter and edit your applications interactively. There is no need to call in special debugging or editing routines; they are inherent in the language and resident in memory. Or, you can write your own special function debugging programs.

Once your application is entered and edited, it can be reassembled in a matter of seconds.

You can also interactively modify by single stepping through your Assembly programs. Each line of the original source code can be displayed for review. Variables can be examined and modified by name.

Compatible systems

The System 35 protects the software investment of HP9825 OEMs and end users who wish to add it to their existing systems. A translator is provided to convert HPL software to System 35 BASIC. In addition, BASIC is fully compatible with both the System 35 and 45.

The System 35A with CRT costs $9900.** The System 35B with single-line LED display, ideal for run-only applications, is $8700.** Both systems have 64K read/write memory and 217K byte cartridge tape drives.

For more information, indicate G on the reply card.

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*IEEE 488-1975

**U. S. prices only.

New & Noteworthy

On-line transaction processing system helps reduce inventories.

A manufacturer's on-hand inventory often represents substantial capital and carrying costs. But when material requirements are planned and controlled, inventory often can be reduced. Even a slight improvement in controlling inventory can have a major effect on profits.

Hewlett-Packard's materials planning and control system, MFG/3000, is ideal for manufacturers who produce multi-piece products in lots or batches. Utilizing the speed and power of an HP3000 Series II or III computer, MFG/3000 software can help to significantly reduce your manufacturing inventory.

MFG/3000 is three interrelated materials planning and control products. One stores bills of material, standard routings, and descriptive part data. Another keeps track of stockroom inventory as well as manufacturing and purchase orders; while the third suggests inventory procurements based on a customer's master production schedule.

With MFG/3000 you can avoid under or over-stocked conditions, recognize upcoming line stoppages due to material shortages, and meet your customer commitments with more certainty.

Proven results

Vydec, Inc., a user of MFG/3000 since January 1978, manufactures and markets floppy-disc-based word processing systems. While increasing sales and production by 100 per cent, Vydec has reduced its months-of-supply inventory by 30 per cent.

With MFG/3000, terminals are strategically situated so that as inventories change, data is immediately entered into and validated by the HP3000. Each department captures an up-to-the-minute snapshot of inventory status. And, as is necessary in many transaction processing environments, user interactions are designed to accommodate people with little or no computer or programming experience.

Vydec's materials manager, Marty Connolly, states, "Because MFG/3000 is an on-line system, we are able to reduce the time between receiving a market forecast and preparing its MRP to one or two days—versus about 14 days under the old system."

Quick implementation

MFG/3000 is a fully-developed, performance-tested package—complete with data base and flexible forms capabilities. No user programming is required for MFG/3000 implementation. And Hewlett-Packard provides the same high level of support commitment as for our HP3000 operating system.

Cutting implementation time and maintenance costs lets you direct your programming resources towards other needs within your company.

Know before you buy

Even before installation of an MFG/3000 system, we consult with customers to discuss their specific needs and the terminal throughput and response time they can expect based upon our documented transaction performance studies. Plus, customer training courses and implementation schedules are suggested.

John Doyle, plant manager for Vetter Corporation (a manufacturer of motorcycle fairings, and another MFG/3000 user), states "We knew what we were getting before we purchased. We felt confident we'd get full support from HP. We were right."

Each element of MFG/3000 sells for $5,000* with a monthly maintenance cost of $150.*

Interested in the cost savings of materials planning and control? **Check H for more information.**

*U. S. prices only.

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Project Management: A Formula for Success

Part 1

By John D. Toellner

IN DEPTH IN DEPTH IN DEPTH IN DEPTH

The cost of developing new systems is rising in every type of organization. Business is getting more complex, and the opportunities for developing more effective systems have improved with the advent of data bases, distributed processing and other technological advances.

Because of the coupling of this dollar value emphasis with an unattractive track record in the management of new systems development, the subject of project management is coming into critical focus for an increasing number of users.

Project management refers to the process that covers systems planning, priority setting, effective design, good visibilty on status and quality documentation. Effectiveness cannot occur in each of these areas unless the systems and programming group organizes so true project management can take place.

The press for change has been sparked by the existence of a series of common, serious problems:

- Projects are consistently completed late and cost more than estimated.
- Users are not satisfied with the final product.
- New systems do not adequately take advantage of new technologies.
- Documentation is inadequate in quantity and quality.
- Managers and users do not know where things stand.

The solution for these problems is not difficult to develop conceptually, but requires the implementation of some management tools and the restructuring of the organization. In developing a project management system and the structure to support it, the following needs should be served:

1. *We should involve management in a meaningful role.* This involvement should be concerned with items of scope, take a small amount of time, members of management to make a needed contribution and require them to use only standard business skills without becoming experts in data processing.

2. *Users should be deeply involved.* They must protect the interest of their departments in the development of new systems. They should be requested to do things where there is a real need and be assigned tasks they can handle. We should require only a small amount of their time.

3. *Guidance should be provided* to the next available staff member on what project he should work.

4. *Project work should be controlled closely* without encroaching on the professionalism of the staff members and should require a minimum of paper work and administrative time.

5. *The staff should receive clear guidance* on exactly what is required in each step of the project. A review process should examine the work developed at each step.

6. *Systems should be turned over to the operations and maintenance groups in a 100% documented condition,* and the documentation should stay that way when maintenance changes are made.

7. *Projects should be made to stay within budget and schedules* at each stage of the work.

8. *Excellent visibility should be maintained at all times* on where things stand and when future events should occur.

9. *The DP staff should get completely and firmly out of the priority-setting business.* It should place itself in an environment where it never has to say 'no' to a user.

The nature of project management causes natural separation between development and maintenance work. By maintenance work, I mean emergency maintenance, planned maintenance, modifications, enhancements and smaller projects.

Efficiency can be gained by segregating the development teams from the maintenance group. When an individual is given a mixture of tasks with one task having high-pressure deadlines and the others having less critical time requirements, the high-pressure task will always grow to absorb the majority of time. When maintenance and development activities are assigned to the same individual, the maintenance work will normally win, which is one of the reasons development projects consistently lag behind schedule.

Familiarization with individual systems is a key point for efficiently carrying off maintenance and small project work. This degree of familiarity is not so important for development because of the unique nature of each development effort. Often the development effort involves systems that do not exist within the organization or an excursion into new technology.

Because of this lessened need for application knowledge, greater flexibility exists for the assignment of development personnel to the next available project. Maintenance and smaller project personnel, however, are more efficiently kept within a particular application area.

When the groups are separate, it is then possible to prepare bar charts, or other visual displays, that show the time frame in which systems will be implemented. This is possible because of the knowledge of the size of each project and the number of development people, assuring that these resources will be available and not siphoned off to work on maintenance or other high-pressure activities.

In addition, separating the development teams and the maintenance and small project personnel also simplifies the priority-setting process.

Many systems and programming organizations are also divided into functional subgroups to directly support a group of user departments. This is a natural and desirable division because of the complex nature of some systems which may require extensive experience and an understanding of the user's business.

If these subgroups exist, I suggest that each of these functional divisions be further subdivided into development and into small project groups to obtain the benefits described earlier.

It is assumed that a project manager (or project leader) exists for each development team and that he reports to the head of a group. Frequently the entire small project and maintenance crew reports to a single supervisor or project manager.

Priority setting is a recommended process for both large and small projects. It permits the users and executive management to decide which work is most important to the organization.

The only work that is exempt is true

(Continued on In Depth/2)

IN DEPTH

(Continued from In Depth/1)

emergency requests. The authority to immediately execute emergency projects is normally delegated to the systems programming manager. This is a satisfactory process as long as it is not abused.

For a development group, a recurring decision must be made. Tomorrow or next week or next month a development team will finish a project and be available for a new assignment. A decision is on which project the individuals will be assigned to tackle next.

Who makes that decision? Any project that is estimated at more than $20,000 or six man-months should be classified as development, in my opinion. With this type of price tag, it is large enough to deserve executive management's attention.

Establishment of a permanent management priority-setting group is recommended. The group should be composed of individuals at the vice-presidential or general manager level from each of the major operating departments which are frequent customers of systems and programming services. Such an executive-level group normally meets quarterly and sets the priorities on all project work, placing project proposals in rank sequence.

The group's efforts frequently result in a schedule displaying the next three to five years' work for the systems programming and development teams. The following year is considered to be firm, with subsequent years being more advisory in nature.

The plan and schedule is always kept up to date through quarterly meetings. This process of placing projects in rank sequence requires executive management to use only standard business skills.

Small Projects

Like the executive-level group for large projects, a decision must be made as to which new assignment a person will be given when a small project or maintenance programmer becomes available. Again, the only question remaining is who makes the decision.

I suggest the creation of a group called the Small Project Priority Committee (SPPC), comprised of manager-level people from the user departments which are the primary customers of modification and maintenance services. This group considers all work that will take fewer than six man-months or cost less than $20,000. The representation on this group should cover the spectrum of user departments.

If the small project and maintenance effort is divided into subgroups by application area, then one SPPC is needed to guide each group of analysts and programmers.

Before each SPPC meeting, individual department managers should rank all work requests within their own departments. The purpose of the SPPC meeting is to merge the work request list into a combined priority sequence to give user guidance to the analysts and programmers for their next assignment.

The SPPC normally meets monthly and sets priorities for the next three months. After each meeting, a simple bar chart schedule can be drawn to give visibility on these priorities..

With the implementation of the executive-level group and the SPPC, DP management is completely out of the priority-setting business. Because these two groups also consider the cost benefit desirability of requests for proposed work, DP is also out of the business of having to say "no" to a user when he requests work.

Service Functions

A series of service functions are necessary within systems and programming. To permit the project management process to run smoothly, each of these services is needed by members of the development or maintenance teams at some point in the project life cycle. These services are:

- *Project control administration.* Effective project management systems get many requests each week that require an answer. If no individual is present to give such an answer, then the project management process can get into serious trouble.

A full-time individual is needed for any group that contains more than 40 to 60 analysts and programmers. For smaller organizations, the project control administrator function can be combined with other duties, such as

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training. It is important that the other assignments given this person be of lesser urgency than the project control function.

- *Data base administration.* An individual is required to review data base matters as projects go through their life cycles. It is also assumed that the data base administrator maintains a central documentation on data elements and similar matters. This function is most effectively performed if it is centralized.
- *Security.* A central place for the audit of control features in newly designed systems and a place where one can get advice on control and security matters is highly desirable. The individual in charge of security should interface very closely with both the internal and external auditors.
- *Operations acceptance.* An individual should be assigned to assist in the systems test and the review of each operation's document to ensure that new systems that are turned over are complete in these regards.
- *Maintenance acceptance.* An individual should be designated to attest to the maintainability of new systems and to certify that a system has been adequately tested so severe maintenance problems will not be encountered.
- *Maintenance change control.* An individual should be given responsibility for examining the testing of JCL and programs and the updating of all required documentation in the operations, maintenance and user areas each time a change is made to the system.

The Master Systems Plan

The systems a company creates are a direct reflection of the business it is in and the role its executive management sees for DP in supporting the business. Without some type of effective plan, the systems development effort lacks emphasis. Whatever development work that does take place tends to be ad hoc, meeting the greatest current pressures brought by individual managers.

In this environment, unserved users often attempt to go outside the company to get their work done. This causes additional aggravation for DP management if standards are to be enforced to ensure effective systems development and to ensure that essential interfaces with existing systems or with future systems are proposed.

The lack of a plan also results in many changes in priorities, with resulting shifts in individual assignments. This normally proves quite wasteful of the systems and programming resources.

When plans are developed, they are often created in a place too distant from the end user and become the DP plan for the organization. But there is an approach that will result in a corporate plan for DP.

From the Top Down

In the development of a plan, the ideal approach is to build on a foundation of the corporate goals and objectives. In many organizations, unfortunately, these goals and objectives have not been clearly and formally spelled out, and it is often necessary to make assumptions regarding the direction in which the organization is headed.

It is also desirable to identify and document DP goals and objectives that support the corporate goals. A long-range strategy for carrying out the company's business can then be developed.

Once the strategy has been developed, it is possible to catalog business functions and to create broad "blueprints" of each application area which identify each major system and the interrelationship of the various systems in that area. If these blueprints are prepared in flow-chart form, each major system would be shown as a single block on the chart, and connectors would identify the relationship between the systems.

This approach can be called a "top-down" plan because it starts with the management objectives, goes to systems and programming objectives, next to systems blueprints by application and then to the identification of individual systems. It is assumed that a proposal is subsequently prepared for projects to create each of the needed systems.

This development process is similar to the IBM Business Systems Plan. A number of reputable consulting firms

(Continued on In Depth/4)

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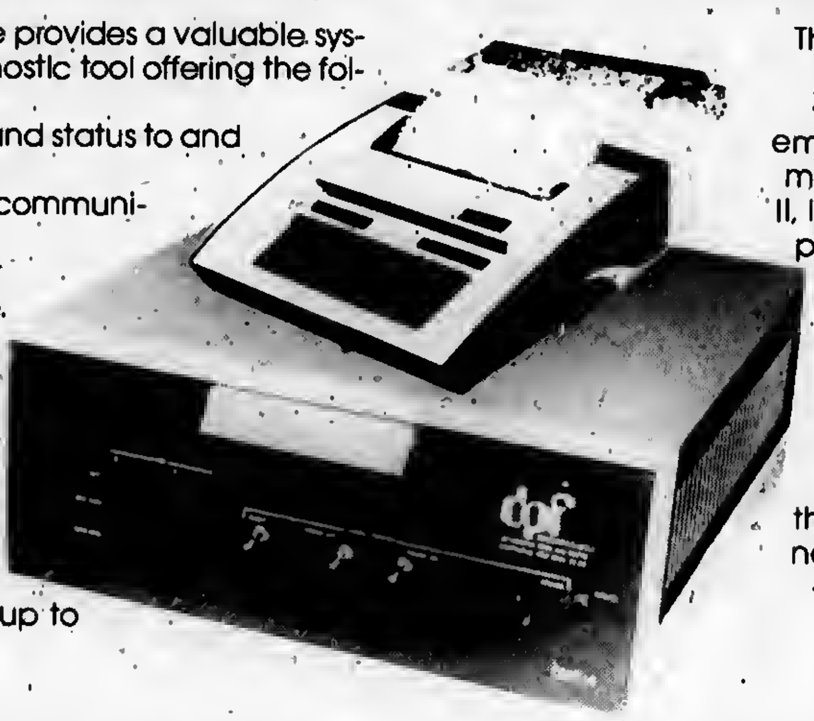

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(Continued from In Depth/3)

have also been using this approach to develop long-range DP plans.

Unfortunately, the process consumes substantial amounts of calendar time and is quite expensive. Largely as a consequence of this and the lack of expertise in this area, very few organizations have a plan in existence or a process to create one or to keep one up to date.

Bottom-Up Plan

To get a plan established in a shorter period of time and to buy time for development of a top-down approach, the bottom-up plan is a real help. This approach starts with a survey of project managers and senior analysts in DP to identify systems that are needed to ease the maintenance or operating problem that exists. The DP staff members are often aware where strong user pressure exists for new or modified systems.

A preliminary list of needed systems prepared by DP should be taken to key user personnel to certify that the systems are actually needed and to solicit requests for additional systems. The next step is the division of listed systems into multiple pieces or combinations of systems that cover the most meaningful scope. Most organizations can develop lists of 20 to 50 systems names by this process.

For such a list, it is desirable to identify the order of magnitude of the required project to create each of the systems. It is suggested that terms such as "massive," "very large," "large," "medium" and "small" be used to identify the level of effort required, rather than trying to attach dollar amounts.

When this is done, any candidate systems that will obviously cost less than $20,000 or six man-months' worth of systems and programming effort can be segregated. It is suggested that this smaller project work be handled in conjunction with the organization's maintenance and enhancement work.

Project Proposals

With either a top-down or bottom-up approach, the plan is not complete until each project has been investigated, the cost and benefits have been identified and a management judgment has been made about the wisdom of using the organization's resources to create each system. The document that captures the data is called a project proposal.

In addition to describing the desired system, this document displays the benefits (both tangible and intangible) the system's requestor expects and a broad estimate of cost.

The estimate is arrived at by considering the scope of the proposed work and comparing it with cost records of prior projects. To improve the accuracy of the estimating process, it is wise to have it performed by a small group of experienced DP persons rather than a single individual.

Proposal preparation normally takes one to three man-weeks, but it can take as long as three months. The key task is conducting broad interviews with users on their requirements. This assignment is one of the most difficult for systems analysts to perform because they have been trained to quickly concentrate on comprehensive detail; conducting interviews for only broad functions becomes a challenge. It is significant that design activities not be performed at this highly preliminary level.

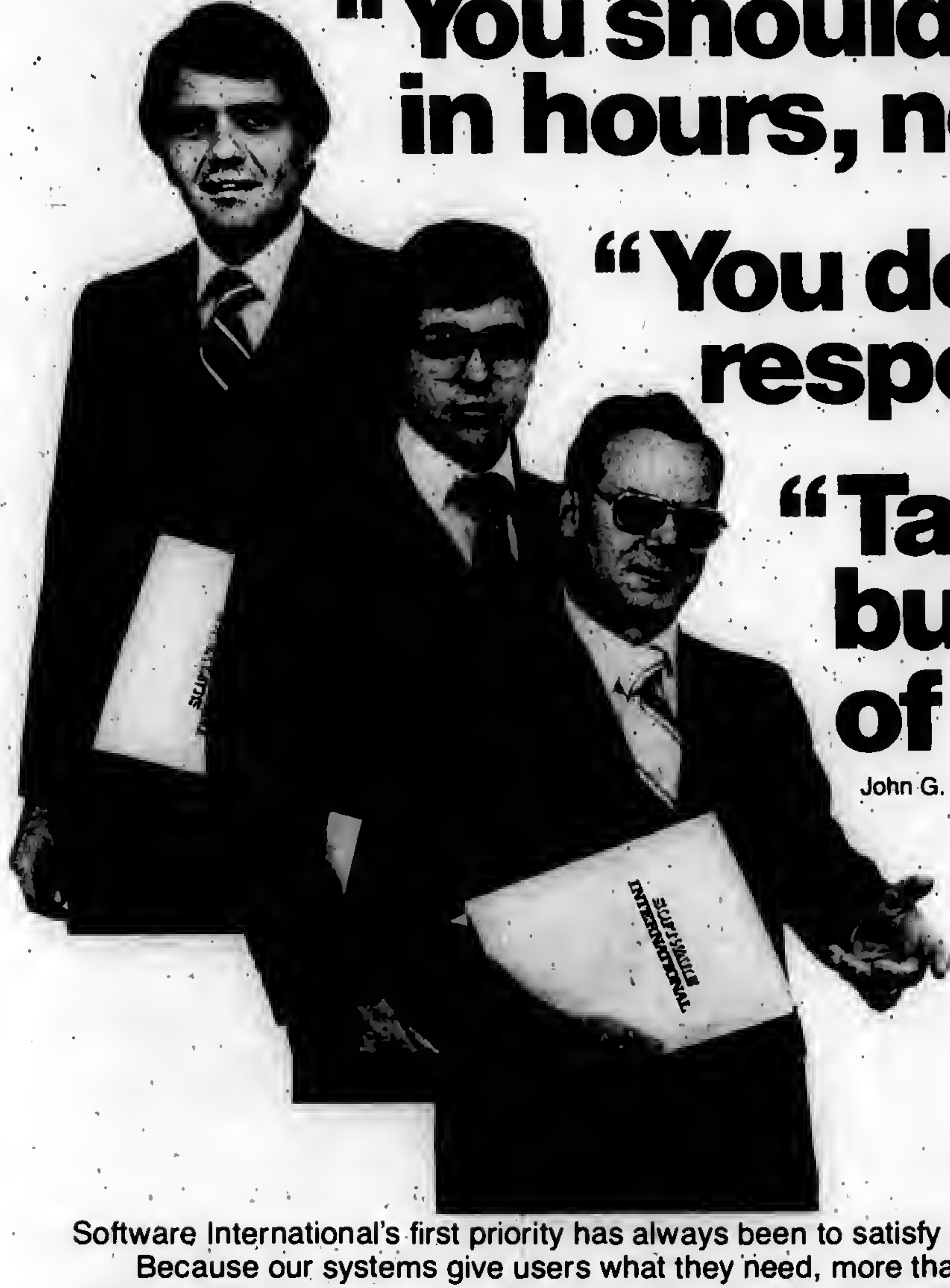
Other major tasks required to produce a proposal are the review of the proposal draft with user management to ensure both its accuracy and their support when it is presented to the management group. User management may then request any needed revisions.

Assembling the Master Plan

Once a series of proposals for each project is complete (six is a desirable number), the priority-setting process can begin.

Although DP management has been doing this by default for years, it should get out of the priority-setting business. The responsibility for this function rightfully belongs in executive management's hands.

Executive management would like to make these decisions if it can be assured it does not have to acquire a substantial technical knowledge of DP to do so. However, as I have already shown, the task can be performed using only conventional business skills.



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It is difficult to assign priorities in an absolute manner. Often many of the projects appear to be of equal importance. An easier process that produces a more practical result is to rank the project proposals.

A prerequisite of this process is that each of the proposals be screened by some responsible management person to ensure that the benefits described are sufficient to justify the roughly estimated cost. Once the cost benefit screening is complete, then the ranking process can begin.

The ranking procedure is most easily performed if it takes place in two stages. Stage I results in the proposals being cast into four groups: (1) essential, (2) high priority, (3) low priority and (4) to be done later. A category of average priorities is purposely not chosen because it tends to be a slop bucket in which proposals are placed when decisions cannot be made.

The differentiation between high and low priorities forces the members of the management group to clarify their feelings about the individual projects. During the initial priority-setting meeting, the casting of the proposals into the four groups can be done quite rapidly.

Stage II combines new proposals with the existing priority list. Once a tentative ranking is accomplished, then the simple exercise of comparing two proposals at a time has proven workable.

For example, suppose there were only enough money to fund one more project — which of two proposed projects would it be? By starting with the two proposals at the top of the list, the rank sequence can be confirmed or altered. By proceeding through the list, pair by pair, it is a simple and practical matter to place all of the project proposals in rank order.

It has been my experience that the top two categories (essential and high priority) will account for at least a two-year workload for the entire systems and programming staff. It is essential that top management set priorities only on this quantity of projects because a series of additional priority-setting meetings will be held over the two-year period to reassess thinking on the project sequences.

Because the project sizes are in excess of $20,000, it is recommended that the executive management level group be used for the priority setting. It is necessary for it to meet only quarterly to confirm the sequence of projects previously ranked and merge new project proposals that may have been developed since the last meeting.

Master Plan Schedule

If the level of resources (people in systems and programming for development work) is known or can be assumed, then a milestone schedule can be developed to let the management and users know where each requested system stands. In the identification of the resource level, it is assumed that the individuals working on small projects and maintenance are not included.

A simple milestone schedule is drawn by considering the dollars per month that the project team can accomplish compared to the estimated dollars on the project proposal. No detailed scheduling or work assignments are considered in this broad level of schedule development.

It is also possible to prepare more than one schedule based on different assumed levels of resources in systems and programming. For example, one schedule can be drawn on the assumption that the department will have 30 analysts and programmers available and a second plan can be developed showing the resulting schedule if there were 40 people on the staff.

After the schedule is produced, it is healthy to review the priorities with the management group, making sure the group is comfortable with the time frame for the development of the systems. Often they will reconsider the resource level of the staff in systems and programming in order to shorten the schedule or will agree to farm out work to accelerate the implementation of the needed systems.

Three-Ring Binder

The development of a master systems plan is most conveniently done using a three-ring binder or its equivalent. In the assembly of such a plan, the author considers the following table for contents to be a minimum.

- Background and purpose.

(Continued on In Depth/6)

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(Continued from In Depth/5)

- Goals and objectives
- Assumptions.
- Statement of strategy.
- Blueprints by application area.
- Priority lists.
- Schedules.
- Individual project proposals.

It is recommended that the master systems plan start with the bottom-up version and list only the last few sections. As progress is made on the top-down version, materials can be added to the other sections as they are developed.

To make the plan an integral part of the project management effort, a key policy is mandatory. This policy states that the only way to acquire development funds within the organization is for a requestor to have a project proposal prepared and succeed in getting the proposal ranked as Priority No. 1. When this policy is enforced, then the long-range planning and priority setting process becomes a permanent and viable part of the project management process.

Without the policy, there springs up by-pass routes for project funding which permits the "squeaky wheel" to get his project work done without taking his request to the priority group. In this environment; the entire priority-setting process can rapidly deteriorate.

Life Cycle Components

In this article I assume the project manager is taking responsibility for the total project. By the total project, I mean all of the user activities that occur in advance of data entry, all of the DP activities and all of the user activities that occur subsequent to the DP function.

When a project life cycle is built under this assumption, it will normally contain substantially more things to do than if we look upon systems only as existing a few inches to the left or right of the computer.

Each architect of a project life cycle normally chooses the term "phases" and will define two to 15 phases. It has been my practice to refer to only three broad phases as a vehicle to communicate the nature of the work being done as the project progresses through its life cycle.

Phase One is systems definition, where preliminary activities take place to understand what the user requires and to decide upon the broad approach to be pursued in the design of the system. Phase Two covers the design and development activity, and Phase Three is concerned with systems implementation.

An important principle in the assembling of a life cycle is that *all* project work must be defined by a task at the correct point. A second principle is that the life cycle should avoid "looping" or cycling back to redo tasks. It should flow from beginning to end.

In each of the three phases, there are certain tasks associated with the design and development of the system. In Phase One, the project must be organized, review boards set up, detailed user requirements documented, conceptual design developed and an evaluation performed to choose the most appropriate direction.

During Phase Two, a large number of the tasks are associated with defining inputs, outputs, data base activities, system specifications, controls, program design, program specifications, programming and unit testing. During Phase Three, the production of user manuals, training materials, systems tests and similar items are handled.

Administration and Control

The second category of things to do on a project is made up of the administration and control activities. In Phase One there are planning activities to assign and schedule tasks, as well as a series of quality controls at milestone points where a logical amount of work has been done. A re-funding activity should take place at the end of this important phase which involves estimating, scheduling and securing management approval.

In Phase Two, quality control is needed at the end of preliminary design, detail design, program design and unit testing, replanning and recertification of the viability of the systems design from the user's as well as the technical viewpoint. Also, special reviews by the data base administrator, the security specialist and the internal auditors must be built in.

During implementation, the planning of the implementation, the review of

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the user manual and quality reviews by maintenance and operations representatives are essential.

The third category of tasks in a life cycle is documentation. Much documentation is a by-product of other activities, but additional tasks are necessary to accomplish the unique documentation that will end up in the operations and maintenance areas.

All of the documentation produced in Phase One is for the purpose of getting the design appproach clarified and is normally not maintained after the project is over. Much of the documentation produced in Phase Two becomes a part of the maintainable documentation at the end of the project. In Phase Three, a series of additional tasks are required to bring about the documentation that satisfies the total needs of the end user, the computer operations group and the maintenance activity.

The project life cycle also becomes an ideal vehicle for the training activities of the department. The life cycle clearly displays all of the task work to be performed at each phase of the project.

By comparing the capabilities of each individual with the tasks to be performed in the life cycle, the identification of specific gaps in training is most easily accomplished. Once the gaps are identified, then the selection of appropriate training courses can be made so that the staff becomes qualified to execute the tasks for which it is responsible.

The life cycle can be considered analogous to a clothesline that has on it a series of garments: one for each design, development, administrative and documentation task. The garments are arranged in the sequence of task execution. This arrangement has the further advantage that as systems development or project management techniques change, it is necessary only to take down the out-of-date garments and to put up the new ones.

It is important that the tasks in the life cycle call for only the work that is needed so a project following the tasks will do only the work deemed necessary by the DP management group.

The standard life cycle is assumed to be the starting point for each individual project. When the project manager plans his project, he starts with the standard, prepared life cycle, eliminates the tasks that do not apply and adds the tasks unique to his assignment.

Support Materials

If all projects were the same size, a single life cycle would be all that would be required. However, projects occur in all sizes from maintenance jobs to massive development efforts.

It has been my experience that settling on three life cycles is impractical. The first life cycle contains extensive control checklists for the maintenance function, which might apply to any project less than one man-month.

For projects that fall in the one to six man-months category, a small project life cycle containing a reduced number of tasks is appropriate, and the full life cycle would be used for all projects larger than six man-months. The complete life cycle is developed first and the other two derived from it.

An additional challenge is to produce guidance materials for the staff. If detailed guidance material is produced for each task, it can be considered threatening by senior members of the staff, who might feel that that much hand-holding is not required. For them, summary descriptions of what to do and what to produce are all that is required. However, for intermediate and junior staff, more specific guidance is usually appreciated.

Forms-Oriented Documentation

In constructing these support materials, suggest that no task be included in a life cycle unless it can be so described that it produces specific deliverables. The reason for this is that it becomes administratively simpler to define the end of the task as being the production of all the stated deliverables.

Further, the reviewing process is simplified if preprinted checklists of the needed deliverables are made available to both the reviewers and the people doing the work.

The deliverables most conveniently take the form of documentation. In my experience, form-oriented documentation is a desirable route to follow. The reasons for this are:

(Continued on In Depth/8)

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(Continued from In Depth/7)

- The assigner of work can most clearly communicate to those who perform the work what he is asking for if he can give them a brief description of what to do and identify specific forms to be completed.
- It is faster to document information on forms than to start with a blank piece of paper, prepare the rows and columns and then document the data.
- Unnecessary documentation can be eliminated because rules can be set to stipulate that only the official forms are used.
- Essential information can be guaranteed if the department requires that all mandatory forms be complete.
- It is highly helpful to the persons performing the maintenance function if the documentation they use always appears in the same format.

Each task needs a standard that describes what to do and what documentation to produce. This material need not be wordy because the life cycle is responsible only for controlling the sequence and format of the deliverables. Including teaching materials in the standard makes the materials bulky and difficult to use on a day-to-day basis. An example of a well-executed deliverable is highly desirable because it quickly communicates the level of detail being requested.

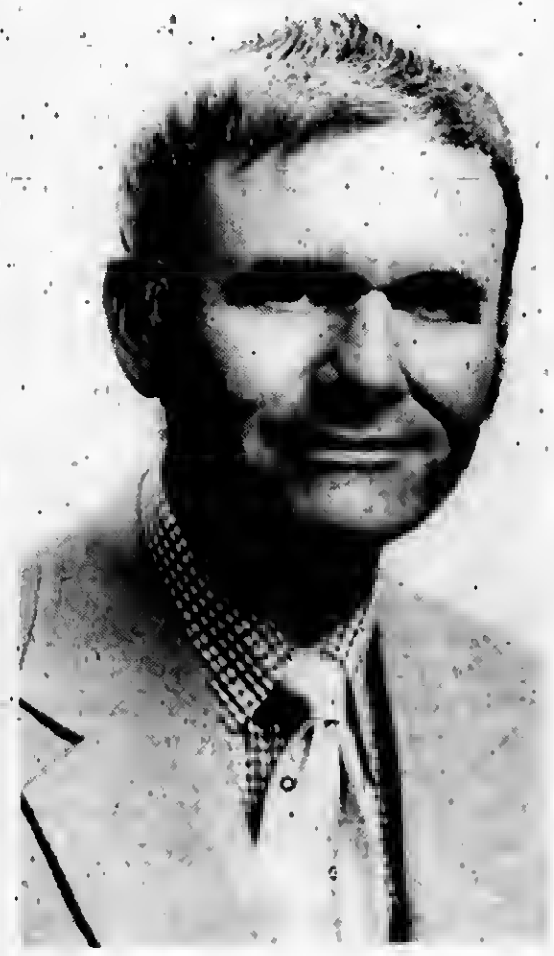
A standardized documentation repository for each of the projects in the department should be created. The repository should contain a series of preprinted tab dividers that identify all the specific deliverables produced on the project. All documentation produced is placed behind the appropriate divider.

The project manager (or any other manager) can quickly determine where the project stands by examining the contents of the repository. Where the repository stands is where the project stands. This simple concept has proved to be extremely useful.

When an audit of the conformance to the standards is performed, the mechanics of the comparison is very straightforward because the repository and the standards manuals use the same dividers. In summary, a project life cycle needs the following characteristics:

- All tasks to be performed must be included: design, development, administrative, control and documentation.
- Each task must produce deliverables; forms orientation provides benefits.
- Three life cycles are needed: large, small and maintenance.
- Detailed guidance material is essential.

The life cycle becomes the foundation for all other project activities such as estimating, planning, technical efficiency, user involvement and operations turnover.



John D. Toellner is president of Spectrum International, Inc., formerly known as J. Toellner & Associates, the developer and marketer of the Spectrum project development system.

Toellner has 27 years of industrial experience; the last 15 years have been spent in DP-related consulting.

The author holds a B.S. in mechanical engineering from the University of California at Berkeley and did two years of graduate study in operations research and computers.

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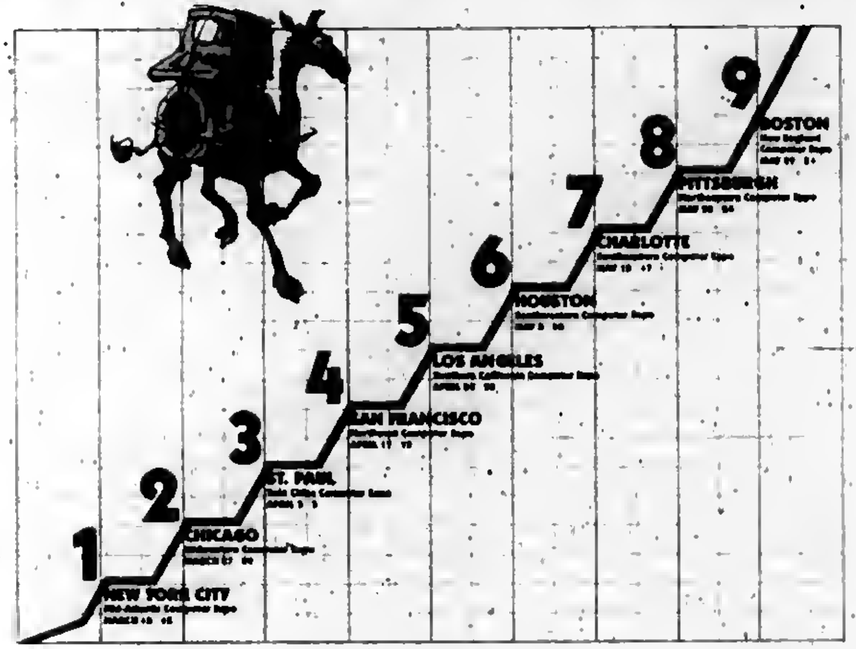

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Computerworld Special Report

a new world of choices
data communications networks

November 27, 1978

Edited by Ronald A. Frank

Independent of Host's Architecture

Dutch Bank to Start Up X.25-Based Private Net

By Leo P. van der Toorn
Special to CW

AMSTELVEEN, Netherlands — One of the world's first private X.25-based networks will come into service in the Netherlands at the end of this year. It was designed by Philips Teleprocessing to meet specifications formulated by the Amsterdam-Rotterdam Bank N.V. (Amro).

The high-speed packet-swtiching network utilizes Comsys; a flexible, application-independent hardware/-software package based on the Philips DS-714 Mark III switching system. Both batch information and interactive inquiry/response traffic will be accommodated by the network, which is expected to handle a daily load of more than one million messages by 1982.

The recording and exchange of information are obviously fundamental to the banking business, and the importance of these functions increases as more stress is placed on diversity of domestic and international services.

The demand for up-to-date management information at all levels continues to rise steadily, as does the volume of information interchange with clearing houses, organizations such as Swift and so on.

In the Amro case, the automation of payment traffic activities in widely dispersed offices throughout the country led in the early 1970s to the creation of office service centers at which customers' transfer orders are collected and the information input via data entry equipment, to a main DP center in Amstelveen, near Amsterdam, where virtually all processing is done.

In order to cope with projected increases in this type of traffic, to meet data communications needs associated with other activities and to provide the infrastructure for future applications, the bank elected two years ago to install a full-service private data network.

Special Significance

Apart from a number of special features, some of which are discussed below, the network has a rather special significance because it is an example of a major DP user installing a large data communications network which is entirely independent of the host system architecture.

Comsys uses procedures and protocols which conform to internationally accepted CCITT standards and are compatible with virtually any configuration of host and terminal facilities. The network is therefore open-ended and can grow and change as new terminal equipment is developed and as public data networks evolve.

Technological developments in hardware or software can be applied to the network structure as they become available, without influence on the DP

(Continued on Page S/15)

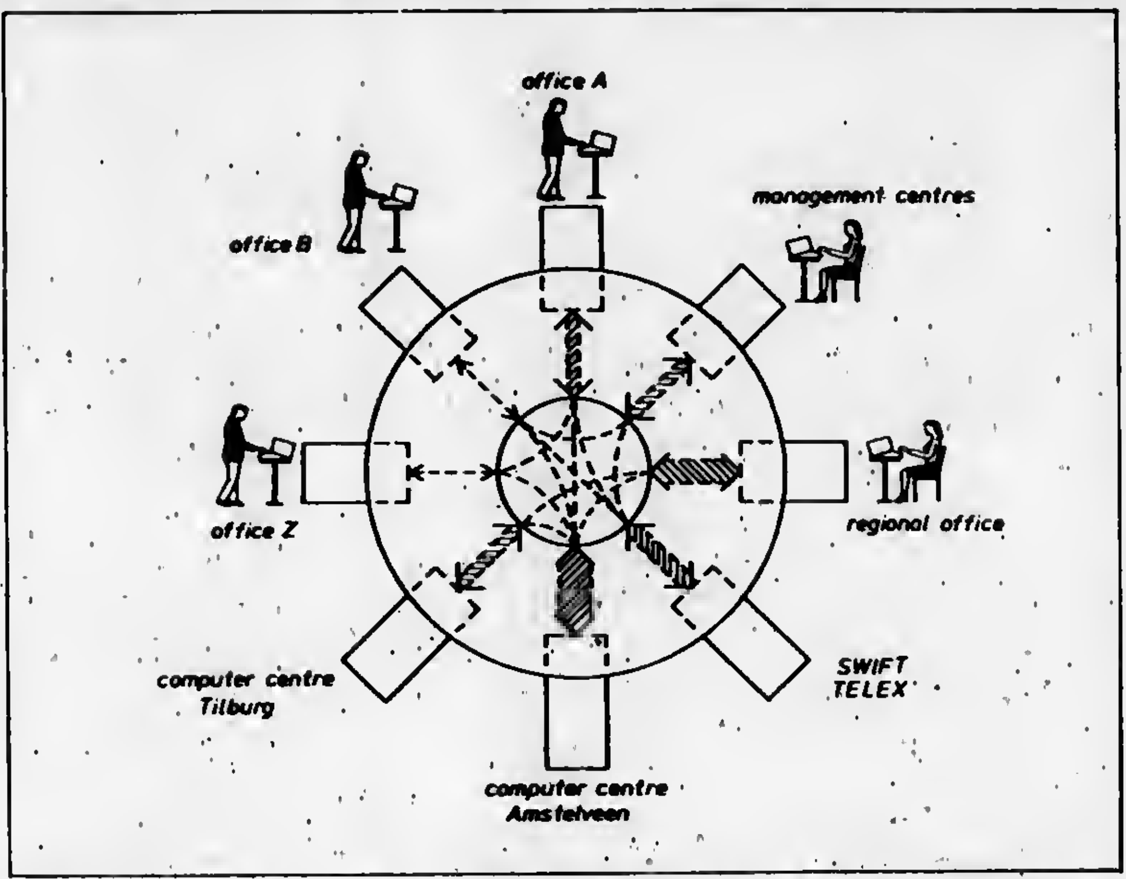

Figure 1. Data flows between sources and systems in the Amro banking network.

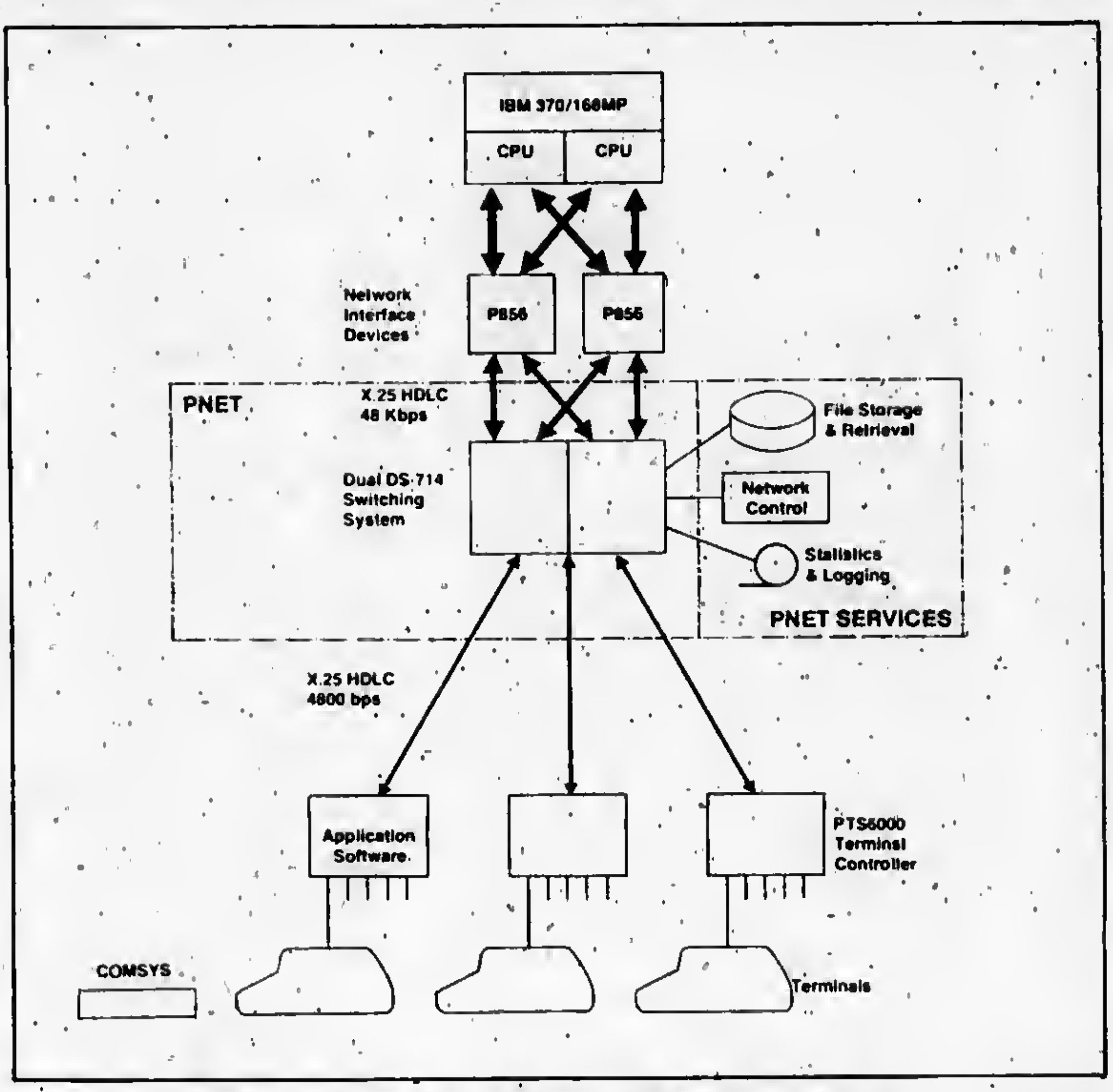

Figure 2. General Arrangement of the Amro Network

Packet-Switched Network Designed for APL Users

By Roger D. Moore
Special to CW

The I.P. Sharp Associates Ltd. (IPSA) APL network began operation in the summer of 1969 with a system that contained one time-division multiplexer (TDM) and 60 dial ports. By early 1976, this had grown into a medium-sized collection of TDMs, including one transatlantic link. During 1976 and 1977, this network was replaced by a packet-switched network.

The primary goal of the network, both before and after the change, has been the provision of APL service to remote low-speed terminals.

The network is not particularly obvious to the user. Initial connection is kept as simple as possible. With a single input, the user can identify both terminal type and destination APL machine. If the requested APL facility is available, user interaction with the network ends.

After the connection has been established, the network acts as a simple forwarding agent: output from APL is passed to the terminal for printing, and input from the keyboard is passed to APL.

Unlike certain public networks, this net has no provision for escape to the network during a session. The closest approach to this is the network recognition of XON/XOFF when the terminal is not in the "input to APL" mode. These control characters allow the terminal to control the rate at which output is sent from APL to the terminal.

The network requires a certain amount of information about the user's terminal for terminal control and for printing legible error messages. The APL/360 trick of examining the initial right parenthesis to resolve BCD vs. Correspondence has been retained. This character was chosen on the grounds that many people would accidentally type it during a sign-on attempt and the information required by the network would be acquired.

The initial right parenthesis from an Ascii terminal is not actually used by the network. It is retained breifly so that an obfuscatory blot can be elicited from APL after a connection has been

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On the Inside

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Net Helps French Bank Grow Easily

By Kathi Bylander
Special to CW

PARIS — A dispersed data communications network is a vital part of the daily operations of Societe Generale, a prominent French bank headquartered here.

By early 1971, Societe Generale had a teleprocessing system encompassing 700 terminals that served the provincial branches and were linked to the central mainframes by a single line.

Despite the quality and extent of the services rendered, however, the system was unable to satisfy the requirements of a bank with 2,600 branches, 35,000 employees and four million accounts throughout France.

Societe Generale had two main DP centers at that time — one near Paris and the other in Aix-en-Provence, just north of Marseilles — and all input from the branches came to these two centers each working night.

After the processing was performed, the reports and other documents were returned to the branches before 8 a.m. via trains, buses, delivery people on motor bikes and so on.

Needs Assessed

In 1972, the bank began studying what the next generation of DP system should be. Transaction volume was growing rapidly and it was clear that the existing system would be operating near capacity by 1978. In fact, it was projected that by 1980, transaction volume would reach 100 transactions per second.

Bank management called in SG2, its computer consulting subsidiary, to redesign the old system. SG2 formed a team of engineers and programmers and went to work.

By 1973, bank management agreed that Societe Generale should aim for a distributed system; by the fall of 1975, it had begun testing.

Two group processors and 50 terminals, plus testing equipment, were installed. Conversion of the first test group and four branches began in October 1975 and was completed about five weeks later. The result was a limited version of the type of operation described here.

Previously, files were account-oriented. If a customer had several accounts, the files had one record for each account. But in the new system, data is customer-oriented. All accounts for the same customer are linked together for on-line query and sequential batch processing.

In all, a three-year schedule was laid out for converting branches and regions to the new system. It is planned that all nodes of the distributed system will be in operation by 1980.

Societe Generale expects that its distributed system will grow with the workload, adjusting to increases in transaction volume and allowing flexibility for opening new branches and regions.

Administrative Core Retained

The teleprocessing system designed by SG2 retained Societe Generale's ex-

(Continued on Page S/28)

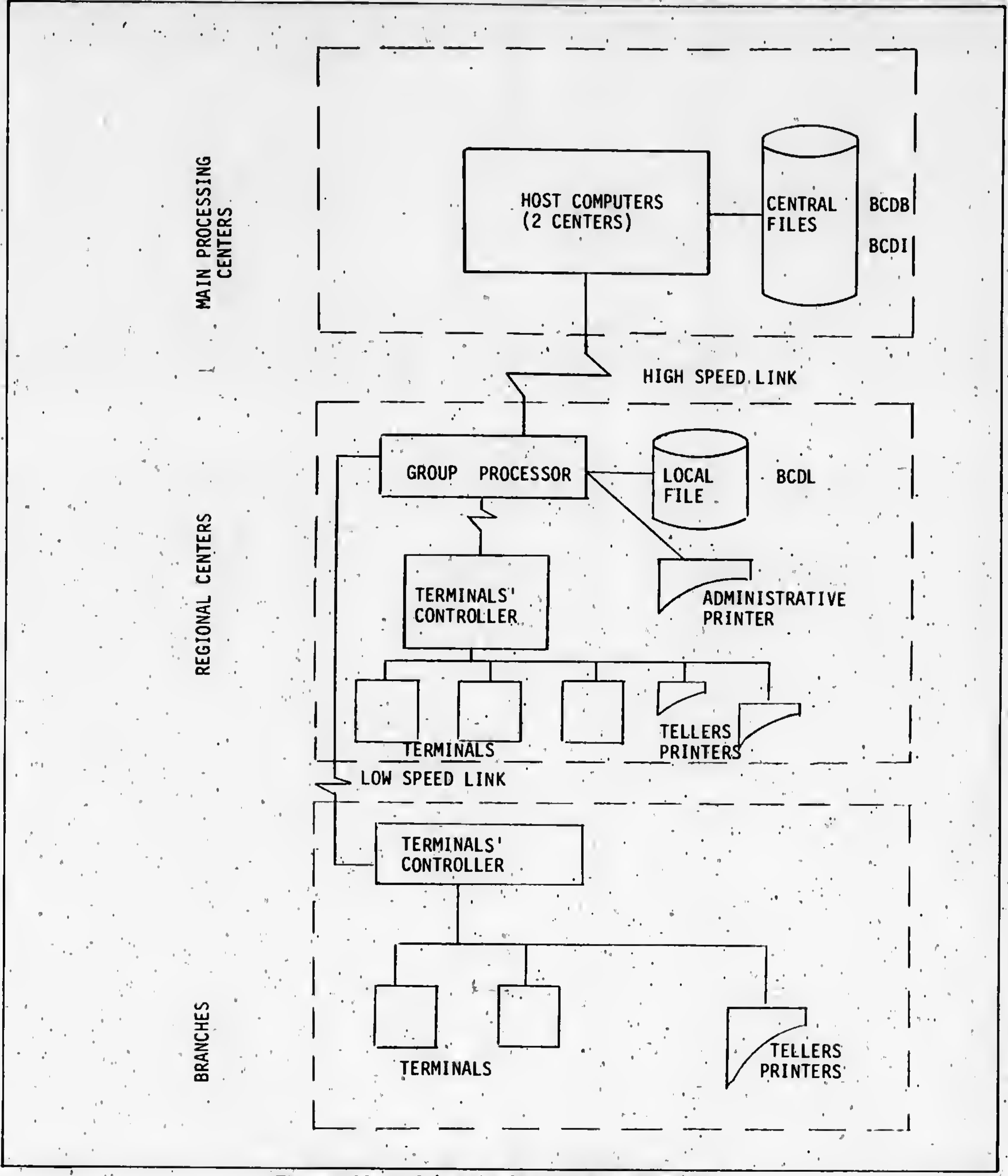
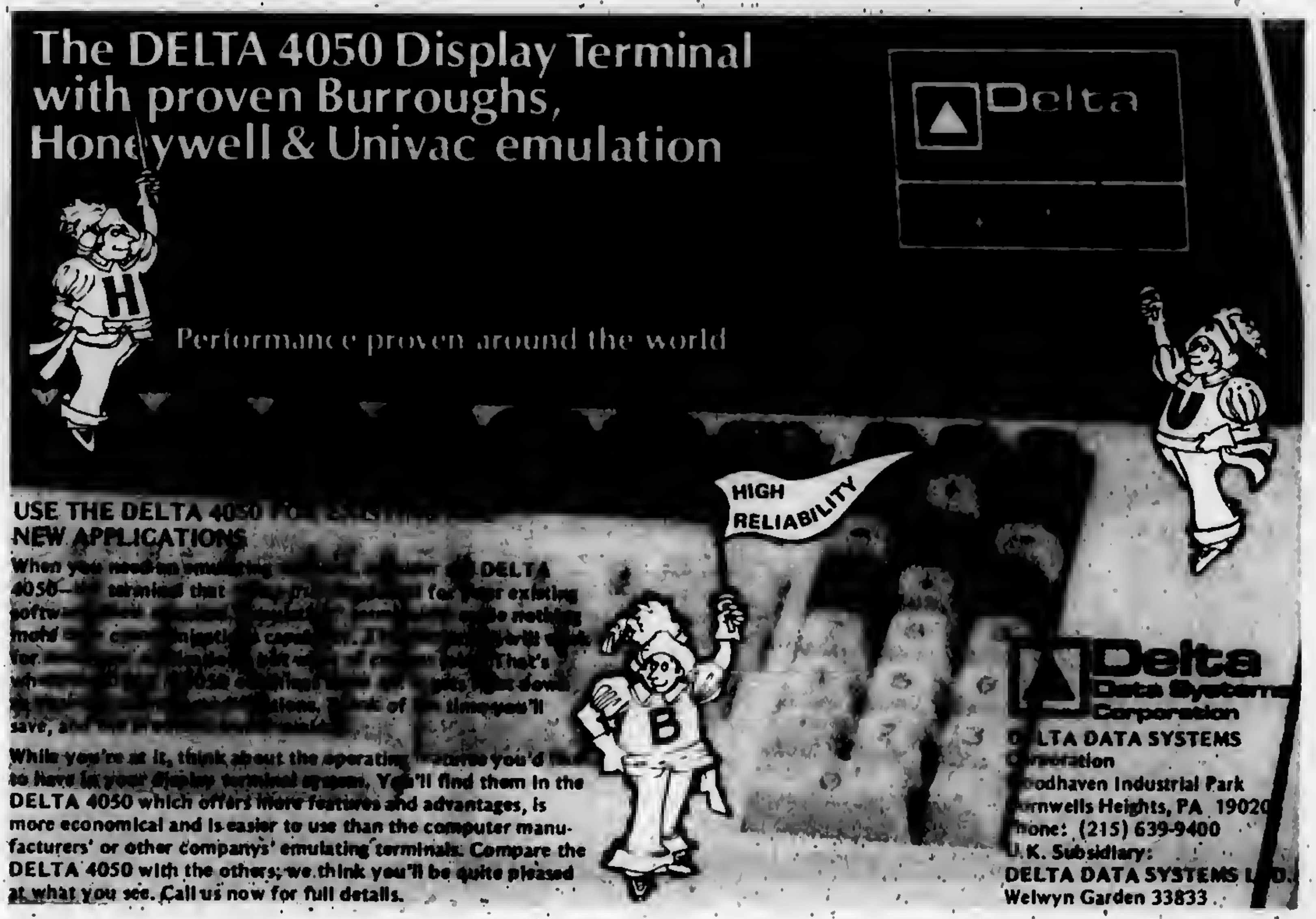


Figure 1. Network (RTA) Scheme of Societe Generale



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Users Cautious, But Many Will Go SNA Route

By John Gantz
Special to CW

WALTHAM, Mass. — Four years ago, IBM pulled together some then-new terminal offerings and a new, barely understood line protocol called Synchronous Data Link Control (SDLC) and announced its Systems Network Architecture (SNA). It thus loosed a cascade of networking acronyms for IBM and other computer and communications vendors that is still inundating the user.

Prior to SNA, IBM's offerings in data communications were a hodgepodge of incompatible hardware and software products. In the decade before SNA, IBM had developed more than 200 communications products, 35 teleprocessing access methods in the host and 15 line protocols.

SNA is IBM's attempt to impose coherence on that tangle, to straighten the compatibility snarls.

Slow in Short Range

But the proposed beneficiaries of the SNA blueprint — the users — have been slow to wed their short-range plans, at least, with IBM's. SNA does not come cheaply, and it requires a commitment to IBM products and philosophy. For the last several years, it has seemed that the marriage of users to SNA has been a troubled one.

Because of a lack of orderly industry statistics on SNA — rumors were rampant that SNA was a total flop — International Data Corp.'s (IDC) *Distributed Processing Newsletter* recently conducted a survey of IBM users to ascertain their plans regarding SNA.

Is SNA a flop? Well, it hasn't been an overnight success. Perhaps IBM didn't intend it to be. The concept itself is intricate and difficult to assimilate and implementation can be complex.

SNA development has been evolutionary — one building block at a time — and a critical mass of SNA hardware and software products probably has not been reached yet. SNA also has some drawbacks:

- System processing overhead can be costly. One public utility saw the number of transactions/sec on its 370/158 Model 3 drop by three to 11.1 under OS/VS1/Vtam over DOS/EXTM.
- Memory overhead can be excessive. A small SNA network with SDLC and the Virtual Telecommunications Access Method Vtam can easily eat up 1M byte of virtual memory and 200K-to-300K bytes of real memory.
- SDLC's seven-frames-in-transit protocol can increase the efficient use of communications lines, but imbalances between inbound and outbound traffic can reduce that efficiency.
- Training for operations and programming staff requires significant outlays and follow-on salary increases.

According to the users, SNA's major weakness is in its software, with Vtam the especial bugaboo — some described it as unstable. Another problem was that IBM salesmen and field service force weren't checked out on SNA in the beginning.

Users Speak

The IDC survey touched base with 241 IBM installations, more large users than small. In all, the sample represented 3% of the IBM 370s and 370/50s or 65s (6% by value of systems installed). More than 15% of the 370/168s and 8% of the 370/158s were accounted for.

The respondents reported more than 50,000 terminals in their networks as of December 1977 and said they would have 70,000 by December 1979. About 30% of those were IBM 3270s.

The questions asked of the users included system configuration as of December 1977 and that expected by December 1979, amount of SDLC use, experience with SNA and evaluation of SNA. Some of the basic findings were:

- Forty out of 241 sites were SNA users, 17 had 370/168s or 165s as the senior system on hand and 14 had 370/158s or 155s.
- Forty-eight more said they would be SNA sites by December 1979: 17 with 370/168 or 165 senior systems, 25 with 370/158 or 155 senior systems. Forty-six more said they would switch to SNA in the "foreseeable future."
- The most popular justification for implementation was better network throughput, but better hardware performance and savings in communications costs were also frequently mentioned.
- The most prevalent reason for rejecting SNA was lack of proven savings. Almost one-third said it required too much memory. One-fifth of the respondents didn't want Vtam.
- Of the 50,000 terminals represented, 4% currently had SDLC. By December 1979, the SDLC percentage will be 16% according to the survey (See Figure 1).

Comments from users in the survey revealed a wary "what's-in-it-for-me" attitude. Those who have switched to the IBM blueprint have done so for the performance improvements more than the cost savings; those who haven't aren't going to move off the dime until the economics are there.

Polishing the Lure

But IBM is changing the equation of those economics.

First, the Armonk mainframer is lowering the entrance requirements to SNA. Early on, the company an-

(Continued on Page S/8)

SNA Applications	Number of Mentions For Current	Number For Future
Inquiry Response	16	21
Sales Order Entry	11	11
Inventory Control	9	12
36XX Applications	7	7

SNA Expectations	Yes	No	No Reply
Did SNA Meet Them?	22	7	11
	(55%)	(17%)	(28%) (Too early to tell)

Conversion Problems

	None	Training	Hardware	Software
Number of Mentions	8	14	12	18
Percent of Mentions	15%	27%	23%	35%

Reasons for Migration	Number of Mentions	Percent Of Mentions
Better network throughput	26	41%
Better prices/newer hardware	22	35%
New applications/easy to go SNA	8	12%
New applications/SNA worked best	7	12%

Reasons for Rejection	Number Of Mentions	Percent Of Mentions
No Proven Savings	62	21%
Memory Overhead	52	18%
Vtam	39	14%
SNA Hardware	27	9%
Stick With Bisynch	25	9%
MVS	21	7%
IBM Marketing Practices	19	7%
Want PCM terminals	16	5%
Don't want central network	14	5%
Don't understand It	14	5%
TOTAL MENTIONS (172 responding sites)	291	100%

Figure 1. User Responses

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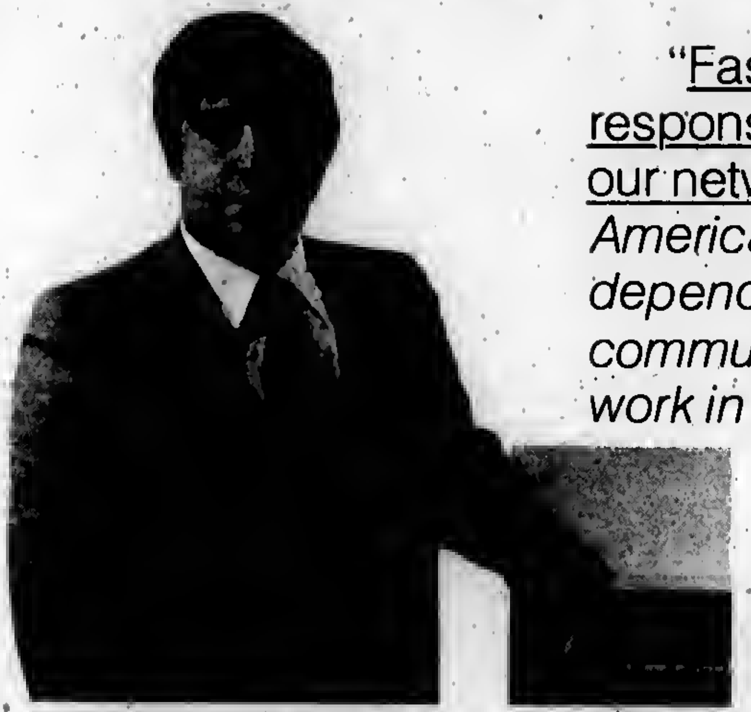

"Faster CRT response times made our network better." American Fabrics depends on its data communications network in providing fast response to customers.

Sixteen CRTs in Los Angeles linked to the firm's Newton, Mass. headquarters via satellite handle some 15,000 transactions each day, according to MIS Director Maurice G. Parent. But as traffic increased, so did mainframe polling requirements. Terminal response times suffered.

A Paradyne PIX II "Virtual" Data Link made American Fabrics' network better by eliminating mainframe polling. Response times dropped from 20 seconds to five seconds on the satellite link because CRTs in Los Angeles transmit only data to the mainframe – not ACKs and NAKs.

"SDLC doubled our transmission rate." Parent said easy implementation of SDLC via Paradyne's PIX II also made his network better, by providing simultaneous two-way transmission and improving response times for remote printers.

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Network Permits 150 Universities to Share

By Paul S. Heller
Special to CW

PRINCETON, N.J. — Edunet is a national service network established to facilitate the sharing of computer-based resources among institutions of higher education and research [CW, Nov. 28, 1977].

Operated as a special activity of Educom, a nonprofit organization located here, Edunet provides services that permit the large community of users to identify and apply specialized resources to meet their diverse DP needs in instruction and research.

Individuals on user campuses work with members of the Edunet central staff to access one or more of the host CPUs at 15 educational institutions that serve as Edunet suppliers. The connection between the user terminal and the host CPU is generally provided by a value-added communications network such as the packet-switched service offered by Telenet Communications Corp.

A facilitating network, a relatively new concept, differs from most networks in that the net itself does not own or operate a CPU or any data communications facilities. Rather, the underlying premise is that many desirable and often unique services already exist but are known only to a small, local group of users.

By making such services known and remotely accessible, a facilitating network can increase the options available to faculty and students and expand the community of users for those institutions that agree to supply services.

Few facilitating networks exist on a national scale, and those that do tend to be single-purpose. For instance, the Health Education Network (HEN) facilitates access to resources in the health sciences. Cache, another nonprofit organization, makes specialized packages available for instruction in chemical engineering.

General-Purpose Net

Edunet is the only general-purpose national facilitating network. Begun as a prototype activity initially sponsored by 22 major universities, Edunet provides members of the higher educational community with the option of selecting among DP resources ranging from interactive statistical packages and analytical research tools to advanced computer-assisted instructional (CAI) materials in virtually every college discipline.

For instance, more than 18 law schools, including those at Harvard University and American University, are currently using CAI programs in law based at the University of Minnesota. These materials, developed by two leading legal scholars, are recognized as among the finest such aids in legal education.

In addition, two schools of library science and education in North Carolina are using Wise — an information storage and retrieval system developed at the University of Wisconsin that is suited to bibliographic data bases. They are using Wise to train their students in on-line search and retrieval techniques.

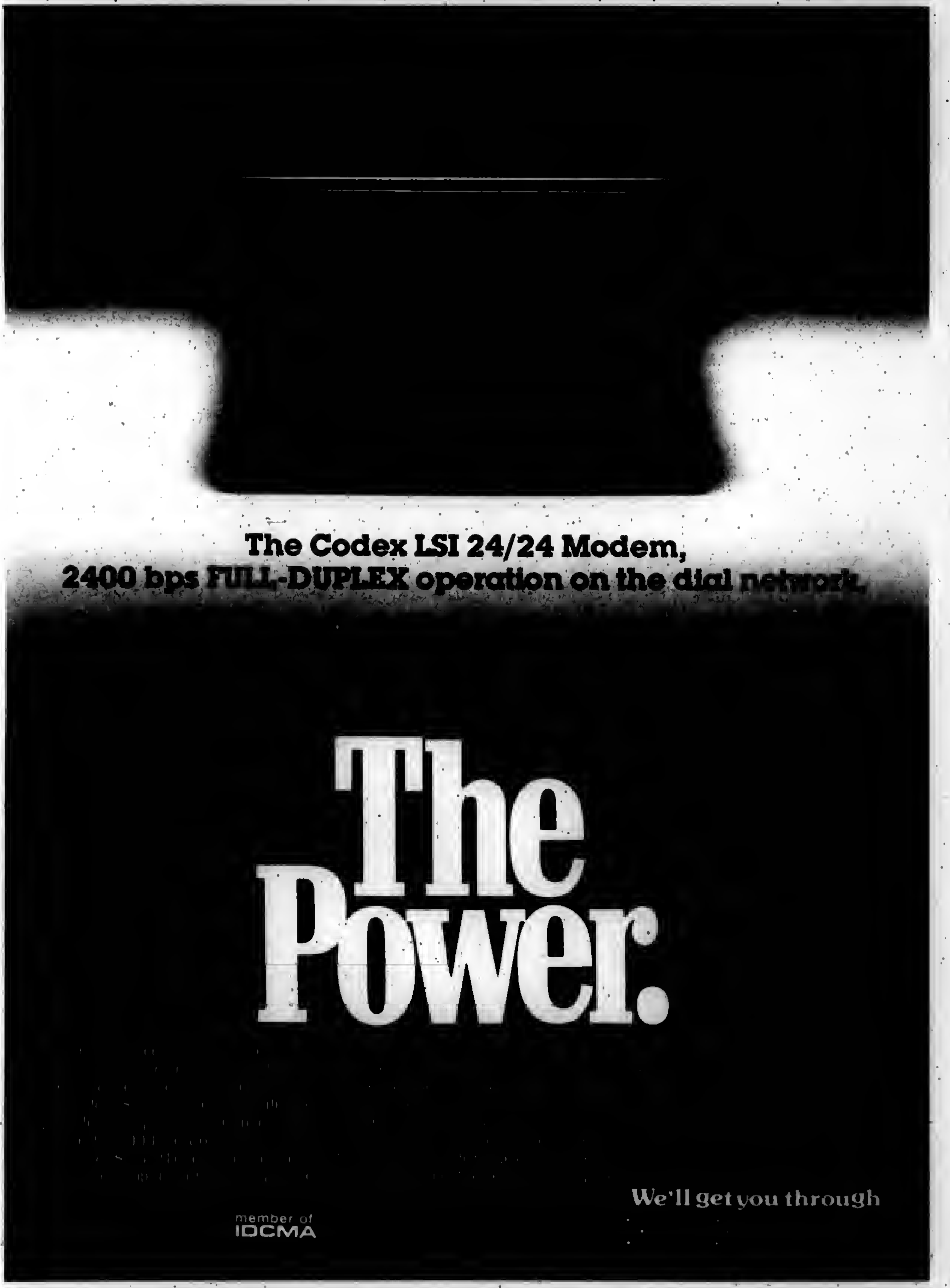
Without Edunet, these and many other computing resources would be unavailable because of the costly, time-consuming and sometimes technically infeasible process of transporting software to a local facility.

Uses Value-Added Networks

While Edunet makes the human connections, collects and disseminates resource information, handles accounts and provides remote user support, it has looked to the communications services offered by the value-added networks for the physical connection between Edunet users and suppliers.

Most Edunet suppliers have a dedicated host connection to the Telenet network. Two suppliers are also connected to Tymnet, Inc. The 13 Edunet suppliers and their hardware facilities connected to Telenet and/or Tymnet include:

- Cornell University (IBM 370/168).
- Dartmouth College (Honeywell Inc. 66/40).
- MIT (Honeywell 6180, IBM 370/168).
- Merit Computer Network: University of Michigan (Amdahl Corp. 470V/6), Michigan State University (Control Data Corp. CDC 6500) and Wayne State University (Amdahl 470V/6, IBM 370/67).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- University of Minnesota (CDC 6400).
- State University of New York at Albany (Univac 1110).
- University of North Carolina (two IBM 370/165s).
- Rice University (IBM 370/155).
- Stanford University (IBM 370/168).
- University of Wisconsin (Univac 1110).
- Yale University (IBM 370/158).

The two other Edunet suppliers currently accessible via long-distance dial-up connection are the University of Illinois at Urbana with a CDC Cyber 175 and the University of Notre Dame with an IBM 370/168.

For access to Edunet suppliers connected to Telenet, users in more than 150 locations in North America need only make a local call and issue a command to select the desired Edunet host CPU.

Several schools, including Cornell, Stanford, and those that participate in the North Carolina Educational Computing Service, need not even make a local call, since the local terminal network has a direct user access port connected to Telenet.

Billing Procedure

Generally, Edunet suppliers are billed directly by the value-added carriers for the fixed cost of the dedicated host connection and for the variable usage costs, which in the case of public dial access to Telenet is $3.25/hour plus a small volume-based packet charge.

The rebilling strategies of Edunet suppliers vary, but in most cases a communications surcharge is added to the normal charge in order to recover costs. The full communications costs are typically between $4/hour and $7/hour when public dial access is used (and less for those schools that have direct user access ports).

This compares favorably with an average communications cost of a direct dial-up call of more than $20/hour.

The low cost of the value-added data communications services has substantially enhanced the economic viability of Edunet. However, cost savings is not the only benefit provided by the value-added carriers.

The conversion of otherwise incompatible transmission codes and formats makes it possible for almost any user terminal, regardless of make or model, to access the systems of Edunet suppliers.

Faculty, students and others in the academic and research community are able to find out about Edunet products of interest to them in one of two ways.

One important channel is through the information dissemination activities of the Edunet staff and campus liaison. One-page supplier fact sheets provide summary information on hardware and software resources of Edunet suppliers. The *Edunet News*, a quarterly publication with a circulation of 10,000, keeps its readers abreast of current Edunet offerings.

In addition, an on-line catalog containing abstracts and other information on more than 500 programs offered by Edunet suppliers is maintained in the Edunet resources data base that can be searched for key words under the Spires system at Stanford University.

Use Via 'Hotline'

The second means of locating Edunet resources is through user inquiries outlining specific needs or seeking specific programs. Such users are encouraged to make requests via a toll-free Edunet Hotline.

In response to these need requests, the staff combines data base searches, "broadcasts" via Telemail (an electronic message system at the University of Wisconsin) and *Edunet News* "Want Ads" in an effort to locate appropriate resources.

Once resources are identified through either of these means, individual accounts with the appropriate Edunet suppliers are centrally assigned.

Upon use, the account holders are billed directly by the suppliers for computer and communications costs. Currently more than 100 accounts at more than 60 user institutions have been established in this manner.

Heller is director of Edunet.

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SNA Acceptance to Grow Despite Uncertainty

(Continued from Page S/4)

nounced support for previously SDLC-only terminals under bisynch protocols and the TCAM access method.

Later, in 1976, the company announced a multisystem networking scheme, increasing the architecture's attractiveness to the big networkers.

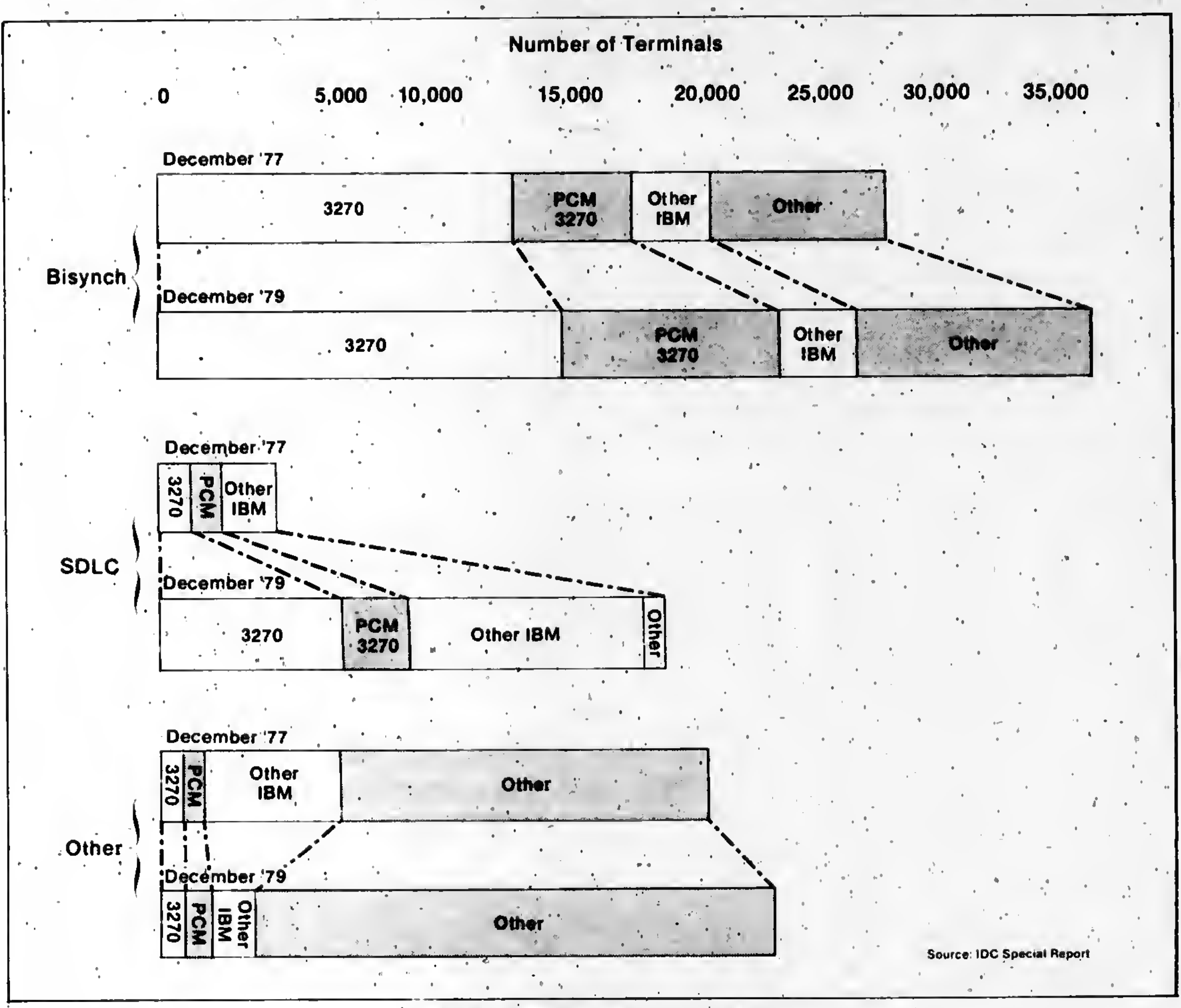
More recently, the Series/1 was allowed into the SNA fold.

Finally, just last month, the company announced the 8100 information system as an SNA product — yet it supports non-SDLC protocols and terminals, including the 2740.

Hardware Offerings

A second way in which the equation is being rebalanced in favor of SNA is through IBM's related hardware offerings, specifically the 30 Series processors.

The overwhelming demand for the new systems is common industry knowledge, but according to a recent Guide (IBM users group) survey, many large-scale commercial IBM users are also switching to MVS — primarily to take advantage of the 30 Series hardware.



Source: IDC Special Report

Figure 2. Terminal Growth by Protocol

Once MVS is installed for reasons independent of network blueprints, it becomes easier to justify a conversion to SNA. Another building block has been winched into place.

Acceptance Predictions

By combining the results of the IDC users survey with IDC's forecasts about the 370/30 Series population through the rest of the decade, some predictions can be made for SNA acceptance:

- 1978 and 1979 will be watershed years as SNA site population rises past 1,000 this year and approaches 2,000 next year. The number of sites will nearly double each year.
- By 1981, almost one-fourth of all SNA-eligible sites (370s, 30 Series CPUs on hand) will be running at least one SNA network. By dollar value of SNA-eligible systems on hand, that represents 45% of that SNA-eligible base.
- By the end of this year, more than 10% of the installed base of 3270s, excluding plug-compatible manufacturers' (PCM) terminals, will be running under SDLC. By 1981 that number will rise to 30%.

Again we ask: is SNA a flop? Put it this way. It was, but it isn't likely to remain so for long. Now that the 8100 has pried open the SNA window a bit — allowing the blueprint to encompass more old terminals and protocols — and the 30 Series CPUs have begun shipment, there is more impetus for conversion. SNA is more attractive (or less unattractive, depending on how you look at it).

On the Road

There are still some uncertainties, of course. AT&T's Advanced Communications Service (ACS) could put a damper on the migration to SNA simply because the older IBM terminals will be supported. But ACS won't hit its "salad days" until the mid-1980s and beyond. By then, SNA will be established — and perhaps its working definition changed — such that ACS will no longer be a threat to the IBM blueprint.

The move to international data communications standards, especially X.25, could retard conversion to a network architecture that didn't support them.

On the other hand, while IBM may be forced to include interconnection to public nets running under standard protocols (witness IBM's X.25 adapters for Transpac and Datapac), it may do so without gutting the entire SNA concept, at least not for a long, long while.

Block by block, kilobyte by kilobyte, selectable unit by selectable unit, IBM's Grand Design will be carried out. All roads lead to SNA. Those roads not leading there will ultimately become the ones "less traveled by," but the users are ambling, not racing on their way.

The survey mentioned is part of the report "SNA and the User: A Troubled Marriage?" published by IDC. Copies may be obtained for $95 from IDC, 214 Third Ave., Waltham, Mass. 02154.

Gantz is editorial director and editor of IDC's Distributed Processing Newsletter.

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. . . And batch-by-batch. Because SDEP also performs **Batch Balancing,** as a further check on the accuracy and count of each record batch prior to introduction into your system in either a local mode or as a remote batch transfer.

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Network Helps Chrysler Dealers Accelerate Vehicle Repair Process

CENTER LINE, Mich. — Chrysler Corp. and its service and parts dealers have reported increased customer satisfaction with vehicle repairs since it installed a computerized parts order system. The on-line system, called the Mopar Parts Connection, currently links nearly 1,000 participating dealers' parts departments directly to Chrysler's central mainframe here with a communications network.

The "Connection" provides up-to-the-minute status for any of 150,000 parts ordered by dealers through any of Chrysler's 19 regional parts depots across the country, enabling Chrysler service managers to schedule work and assure customers vehicle repair on a predictable schedule.

Loren Bertran, parts manager at Van Ness Chrysler-Plymouth-Dodge in San Francisco, inputs a parts order to Mopar.

The Mopar Parts Connection is made through Tymnet, the public packet network operated by Tymnet, Inc. A local phone call to the nearby network node connects the dealer to the parts data base on Chrysler's twin Amdahl Corp. 470V/6 computers here in Center Line.

Tymnet provides local telephone access to dealers in some 135 domestic access cities, while Chrysler provides Wats lines for dealers located outside of major metropolitan areas serviced by local Tymnet nodes.

Participating dealers lease an Alanthus Corp. 30 char./sec teleprinter, a wide-carriage terminal that provides a direct link to the Center Line mainframes.

Reaching Chrysler's Detroit-area parts CPU is an uncomplicated procedure. A special telephone number reaches a Tymnet communications processor (Tymcom) in a "node" city. The Tymcom functions more or less like a traffic controller to route calls of many subscribers over the public packet network.

In a matter of seconds, the Tymcom recognizes the caller as a Chrysler dealer who wishes to communicate with the Detroit parts CPU. The connection is made and the mainframe signals that it is ready to receive input.

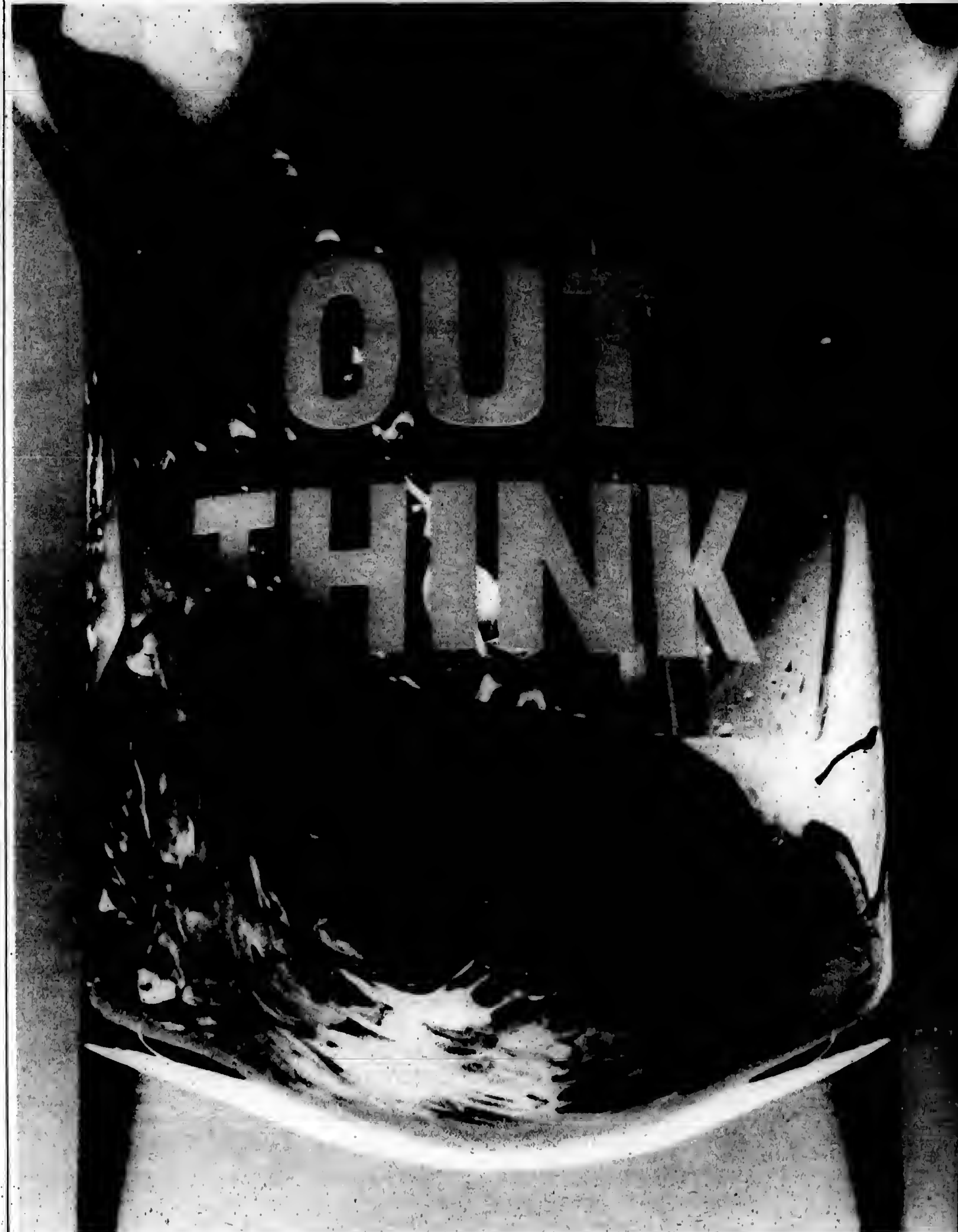
Thereafter, dealer service personnel are in direct communication with the system from their printing terminal stations, cutting out middleman functions and reducing errors to near zero.

Before the existence of the Mopar Parts Connection, dealers placed customer vehicle repair parts orders in one of two ways, both of which generated costly phone bills and were considerably more time consuming:

- A dealer could place a call

(Continued on Page S/11)

The computer can match an order to the right part even if an outdated part number is used.



Parts Order System Speeds Chrysler Repairs

(Continued from Page S/10)

and leave a message through a code-a-phone, an electronic answering/recording device that prompts the caller for his requirements. This method was used for nearly half of Chrysler's parts orders.

- For special-handling orders, which account for about 3% of Chrysler's orders, dealers placed long distance phone calls to an expediter at the nearest of the 19 parts depots. The expediter would then transmit orders on-line and make inquiries of the central mainframe.

Now, dealers using the Mopar Parts Connection access the computer directly and get fast response. They can determine from which of the 19 depots a part will be shipped, how the shipment will be made and when the item will arrive. They also can check status on earlier orders.

Ralph Davis, assistant parts manager at Clyde C. Netzley, Inc., a Plymouth-Chrysler dealer in the Chicago area, likes the speed and simplicity of the network. "It takes only a minute or two to establish connection with the Detroit computer, and the codes we have had to learn aren't all that complicated or numerous," he said.

Davis and his co-workers, who use the Mopar Parts Connection computer up to 10 times a day, estimate they save more than an hour a day over the old method.

A key feature of the computerized system is the ability to update parts numbers. There are some 150,000 different parts in the data base, and single part's number can change up to five or six times in several years. The "Connection" will take an old number keyed into the system by a dealer and automatically update it, saving the dealer the time often spent looking up the latest part number.

One of the system's most valuable attributes is that it provides any dealer with the ability to check the status of an order at any time from depot to dealership. He can determine the date of shipment, the depot from which it was sent, the transportation service used and the bill of lading number. The dealer can continue to track the shipment until its arrival.

When a dealer places an order, the specific items are committed to him, inventory levels are automatically adjusted and the part is ordered from the nearest depot.

Bertran cross-checks Chrysler parts received against the terminal printout produced when he initially ordered the items.

"Knowing which of the 19 parts depots the part is being shipped from is a special advantage," observed Loren Bertran, parts manager of Van Ness Chrysler Sales and Service Corp., San Francisco. "Our service people can be reasonably accurate when notifying a customer, in most cases, the day and hour his vehicle can be repaired. It's helpful for us and convenient for the customer."

An added feature provided by the system-to-dealer parts specialists is the hard-copy printout of all transactions. The printout is not only valuable as a permanent record, but also can be used to guard against errors or make revisions to orders.

Liquids, the most adaptable of all matter, shape themselves exactly to fit their containers.

In much the same way, a Datapoint ARC™ system adapts itself to fit the needs of a business.

In this day when competitive edges are frequently slight and often difficult to come by, you have to out-think your competition to gain an advantage. The Attached Resource Computer system can help by putting powerful data processing capability at the hands of those who need it most; wherever they are in the company.

Not just another network

An Attached Resource Computer system is an arbitrary number of small, powerful, inexpensive computers, each performing its assigned tasks independently, yet all are totally interconnected to share common resources and draw from a common database. For high reliability, the system is composed of proven Datapoint processors and peripherals.

One of the ARC system's strengths is its specialization of components. One or more processor in each system is dedicated to file processing and management. The others are applications processors. Internal communications are achieved by an Interprocessor Bus, using dedicated Resource Interface Modules (RIMs).

This capability frees a computer from juggling all three functions. Consequently, processing can be carried out at much higher throughput. Even though the processors are functionally dispersed, the system is a single, unified computing facility, with the processing speed and capability of a large, conventional computer.

Solves growth problems

This new, modular architecture offers easy-to-implement solutions to the problems of system planning and growth. The system manager can add (or delete) processors or file storage as workloads change.

Expansion can occur in modular, incremental steps, at predictable, affordable costs. Only enough processing power is required at a given time to accomplish the immediate workload. Important capital is not tied up in costly overcapacity, yet the work is not delayed by a bogged-down, overworked computer.

Protects software investment

The ARC system can use your present Datapoint system software. When additions are made to the system, current software is not affected. All the Datapoint resources suitable for participation in an ARC system are completely compatible.

While direct hardware cost comparisons are difficult because of differences in architecture, our studies indicate that the cost of an ARC system may be only 50% to 70% of the cost of a more conventional system with equivalent capabilities.

Total adaptability

The applications at work in an ARC system ~~can be as~~ varied as the diverse functions of the business environment. The concept applies to any type of firm engaged in one or multiple endeavors. Its usefulness is equal whether it's in a corporate home office, a division headquarters, or a remote office. Or all three can simultaneously employ their own ARC or other Datapoint systems and interconnect them through telecommunications links.

A nationwide support network

There are more than 500 Datapoint Customer Service Representatives in the field, stationed in over 130 local service area offices. The system is designed to place customer service and support as near as possible to Datapoint's 11,000 installations.

Write for more information

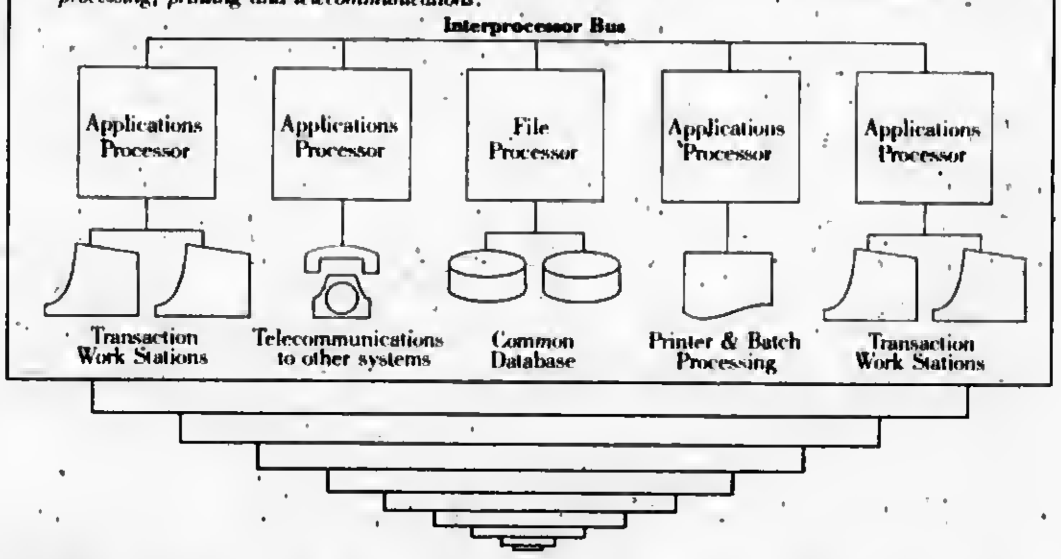
A Datapoint Attached Resource Computer system is the ideal solution to your business data processing needs. Datapoint has to out-think its competition. The ARC system puts us another big jump ahead.

A booklet describing the features and advantages of the ARC system is available by writing to Datapoint Corporation, Marketing Communications Dept. (M62), 9725 Datapoint Drive, San Antonio, TX 78284. Or call the Datapoint sales office nearest you.

◄The adaptability of an Attached Resource Computer™ system is another example of how Datapoint out-thinks its competition to help you out-think yours.

ONE ARC™ SYSTEM!

One of an almost limitless number of configurations, this ARC system contains up to 480K of on-line user memory, 200 MB of disk storage, and 48 transaction work stations, as well as facilities for batch processing, printing and telecommunications.



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Service Reduces U.S.-UK Transmission Costs

By Barry D. Wessler

Special to Computerworld

The first transatlantic link in an emerging worldwide system of interconnecting public data networks went into operation this fall between the U.S. and the UK.

The International Packet Switching Service (IPSS) enables users on both sides of the Atlantic to send low-, medium- and high-speed data at costs that are related to volume and substantially lower than any other means of data communications.

IPSS is being offered jointly by the British Post Office (BPO), the three major U.S. international record carriers (IRC) and the Telenet Communications Corp. and Tymnet, Inc. packet networks in the U.S. Telenet has supplied the packet-switching equipment and software being used at both the BPO and the IRC gateways.

IPSS replaces the BPO's Data Base Access Service, which was limited to low-speed dial-up access from the UK to U.S. systems. In contrast, the new service is bidirectional. IPSS gives UK users access to data bases and remote computing systems in the U.S., and users in the U.S. access to similar resources in the UK.

For the first time, overseas packet communications can be used for synchronous applications. Currently, computers or intelligent terminals using the CCITT X.25 protocol can communicate over the IPSS link at synchronous speeds up to 9,600 bit/sec.

Typical of the initial users of overseas packet communications service is The Information Bank, a subsidiary of *The New York Times*. Like many computer-based data banks; The Information Bank had not pursued the European market before because of what it considered prohibitive communications costs.

In 1977, when 300 bit/sec dial-up access to the U.S. became available, the firm opened a sales office in London and now has 40 to 50 clients in the UK and on the continent. The addition of 1,200 bit/sec dial-up access will make such data base services even more attractive to UK users, since it will lower total communications costs.

Among companies looking at IPSS for synchronous applications such as computer-to-computer file transfer is Prime Computer, Inc. Prime sees IPSS as a more timely means of keeping track of production scheduling and sharing program files between its R & D groups at corporate headquarters in Framingham, Mass., and Bedford, Enland.

Economics Of IPSS

The users who are likely to benefit the most from IPSS are those who need to transmit less than 500 hours of low-speed data per month or less than 100 hours of higher speed data per month.

For lower speed applications, 1,200 bit/sec or lower, the best previous alternatives were Telex at $153/hour and Datel at $108/hour.

For medium-to high-speed transmission, international leased channels are an economical alternative for only the very largest multinational companies that can justify the cost of $9,090/mo for a dedicated line.

The actual cost of an alternate voice/data (AVD) channel between London and the U.S. is well over $10,000 when all the associated costs are taken into consideration.

In contrast, IPSS rates average $22/hour for 300 bit/sec service and $24/hour for 1,200 bit/sec service, including connection time and traffic charges. For batch transmission at 2,400 bit/sec, usage charges are expected to average $110/hour, and for 4,800 bit/sec, $210/hour. These charges are the same regardless of the user's location in the continental U.S.

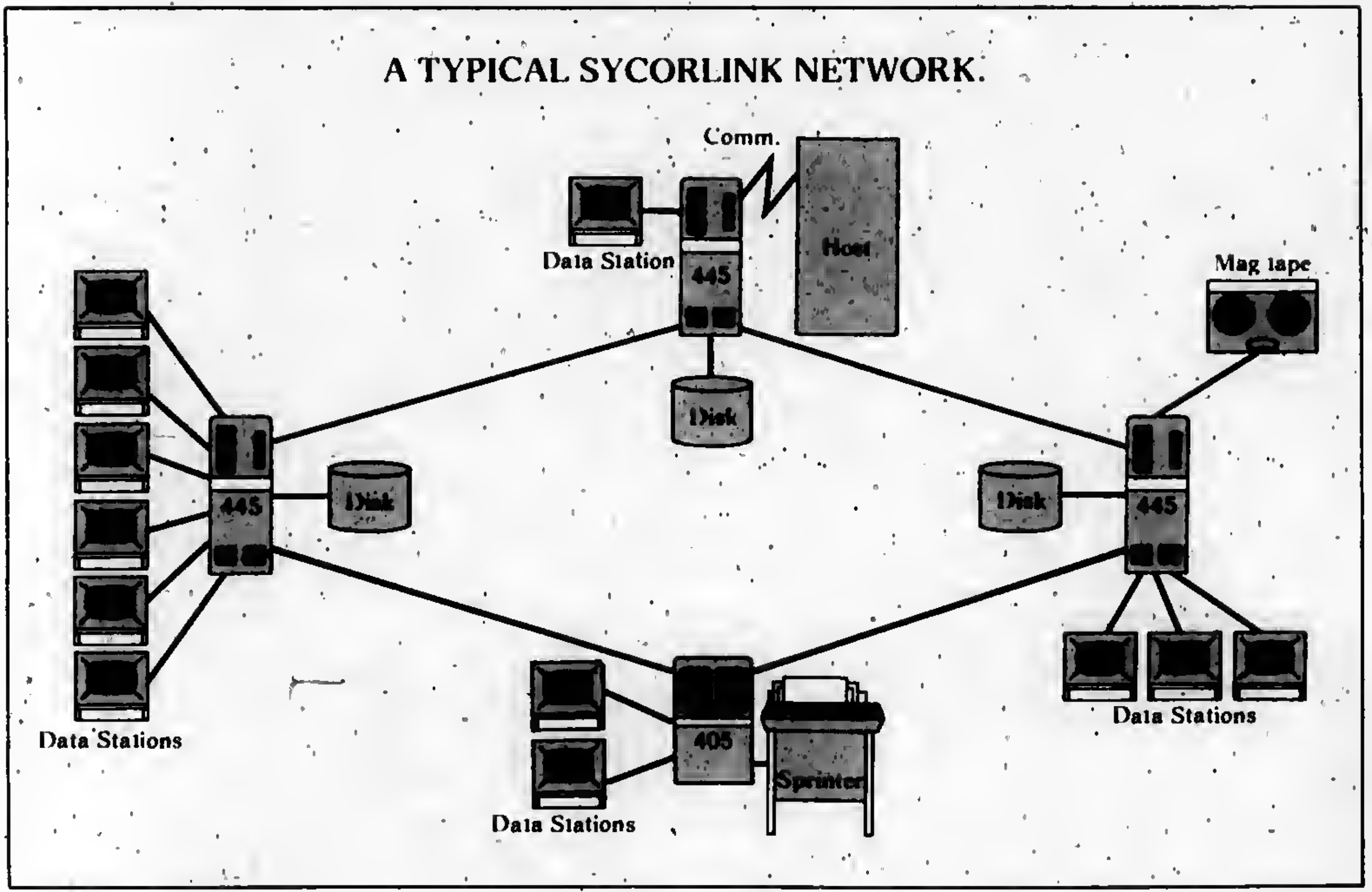
Perhaps the most exciting feature of the service is its ability to handle synchronous inquiry/response terminals of the type widely used within the U.S. for order entry applications.

(Continued on Page S/13)

	Speed	Cost
International Leased Channel	2,400 to 9,600 bit/sec	$9,090/mo
Telephone	Voice grade	$108/hour ($81 off peak)
Telex	50 bit/sec	$153/hour
Datel	1,200 bit/sec	$108/hour
IPSS/Telenet	300 bit/sec	$22/hour
	1,200 bit/sec	$24/hour
	2,400 bit/sec	$110/hour
	4,800 bit/sec	$210/hour

Rate Comparison for U.S.-UK Communications

Now
can divide



Sycorlink™ is a revolutionary resource sharing feature that lets you distribute the power and resources of computer systems throughout your organization. And conquer the problem of providing all your departments with the services they're looking for. At a price you're looking for.

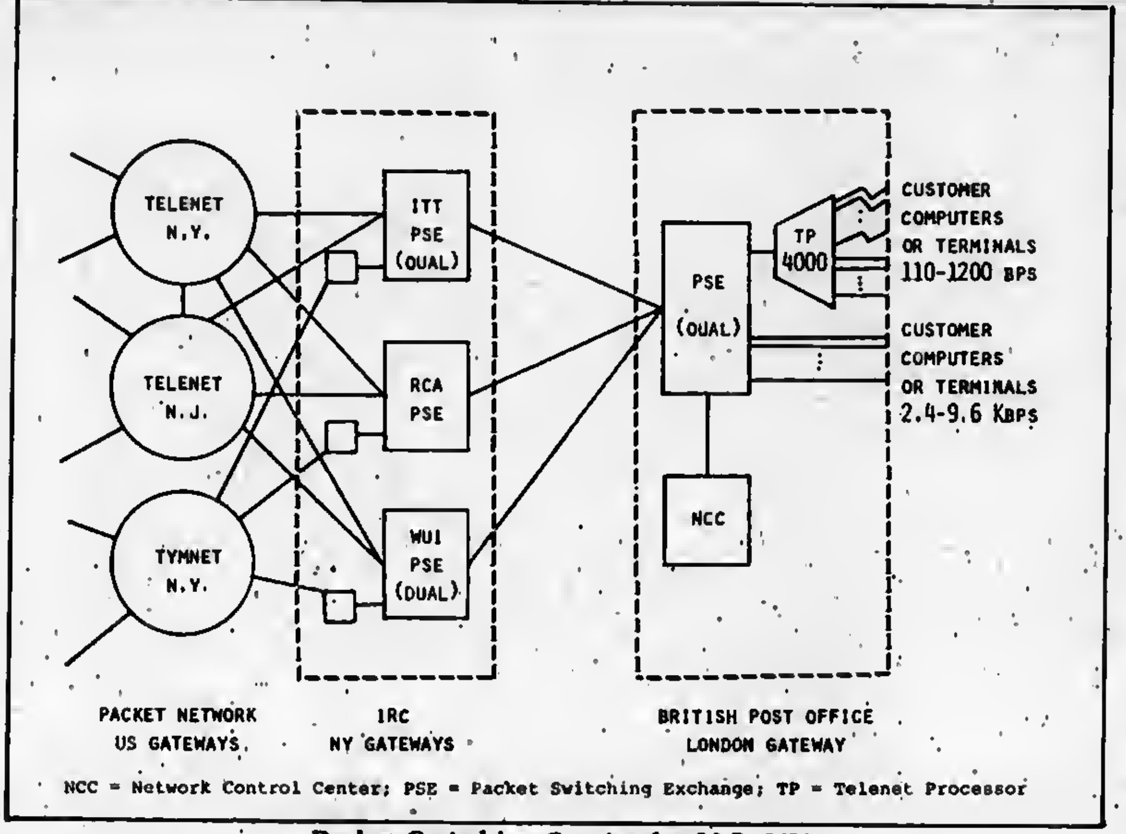
In a nutshell, the Sycorlink networking feature is distributed processing the way it was meant to be.

Put the power of your network at every work station.

With Sycorlink, every system in the network can be tailored to handle the processing tasks of individual departments. And at the same time give authorized users in any department the power to access the files and peripherals of every other system in the network.

A user at any work station can access any file on any disk in the network. At the push of a key. Any file on any disk can be printed on any printer in the network. Any file can be transmitted to the host.

Any system in the network can process data from any file on any disk located at any other node in the network. And a system can be dropped out for maintenance or service


TELENET N.Y.
TELENET N.J.
TYMNET N.Y.
ITT PSE (DUAL)
RCA PSE
WUI PSE (DUAL)
PSE (DUAL)
TP 4000
NCC
CUSTOMER COMPUTERS OR TERMINALS 110-1200 BPS
CUSTOMER COMPUTERS OR TERMINALS 2.4-9.6 KBPS
PACKET NETWORK US GATEWAYS
IRC NY GATEWAYS
BRITISH POST OFFICE LONDON GATEWAY
NCC = Network Control Center; PSE = Packet Switching Exchange; TP = Telenet Processor

Packet-Switching Service for U.S.-UK

Expanded Network Service Cuts Transmission Costs

(Continued from Page S/12)

Raytheon Data Systems Co. already has an X.25-compatible cluster controller system that can be used over packet networks. Called Raypac, this system operates in conjunction with IBM 360s and 370s and provides users with the functional equivalent of IBM 3270 terminals.

In this example, the host end interfaces to the packet network through Dmep, a software package for IBM 3704/3705 communications controllers.

The economics of IPSS make it very attractive for U.S. companies to extend order entry and other synchronous inquiry/response applications to Europe.

The total cost of the service works out to approximately $4,700/mo, less than half the cost of an overseas leased channel. Of that amount, the user will pay about $1,600 for holding time, $2,400 for traffic charges and $700 for the local port and access line at the UK end.

System Facilities

In order to broaden its overseas packet communications services, the BPO has installed a fully redundant packet switching node and network control center, similar to the equipment developed and used by Telenet in its domestic network.

The minicomputer-based processor is used to switch traffic and to concentrate synchronous traffic from subscriber computers and intelligent terminals. Asynchronous dial-up and dedicated lines from subscriber terminal terminate in the processor.

The IPSS network control center, a minicomputer-based system, provides the BPO with downline loading of software, centrally controlled remote diagnostics, continuous monitoring of network operational status and collection of statistical and accounting data.

Cable facilities operating at 9,600 bit/-sec link the BPO packet-switching exchange (PSE) with similar facilities in New York, operated by ITT World Communications, RCA Global Communications and Western Union International.

Each of these three separate overseas routes is backed up with standby lines in case of cable failure.

The BPO currently interconnects with the U.S. IRCs using an enhanced X.25 protocol. The CCITT X.75 protocol for network-to-network transmission is expected to be implemented during 1979.

At the U.S. end, the record carriers connect into the Telenet and Tymnet packet networks for nationwide distribution of data.

The Telenet network is doubly connected to each IRC at network switching centers in New York and Newark, N.J. This dual gateway configuration permits alternate routing of data along the fastest route available at any given moment.

International connections with the Tymnet network are made in New York through a gateway located at each IRC packet switching exchange.

In deciding whether to use IPSS, an important consideration for users is the level of service quality that IPSS and packet networks in general provide.

With redundancy built into each individual component of the service, no failure of any one subcomponent can affect service.

In addition, the packet-switching exchanges perform error checking and retransmission of data and thus compensate for the high error rate often associated with international transmission facilities.

Users should be looking at IPSS as a prototype for the way in which overseas data communications will soon be handled throughout the world.

Wessler is a vice-president of Telenet Communications Corp., Vienna, Va.

you and conquer.

without disrupting the flow of data to and from any other node.

Match the workhorse to the work load.
The Sycor 405 and 445 distributed processing systems can be mixed and matched in a Sycorlink network to create individual processing nodes with just the right amount of power for a specific department or location.

And while each node may be individually configured, it can access the files of another node just about as fast as its own files. Communicating this fast within the network allows nodes to share expensive peripherals, such as a line printer. So any way you put it together, your Sycorlink network has the performance capability that can get your job done. The way you want it done.

This means you never have to overequip any location, paying for power you don't need. Your first step in building your distributed processing network is the right one—with nothing to trip you up down the road.

Get started on a no-detour growth path.
The upward compatibility of the Sycor 400 series lets you grow your network without redesigning your system or replacing hardware. We call it planned nonobsolescence.

As your needs at a specific site grow, our compatible 405 and 445 systems let you upgrade without reprogramming or introducing unfamiliar hardware to your operators.

Install systems up to a half mile apart.
A Sycorlink network permits installation of systems up to a half mile away from each other. The systems are connected to each other by coaxial cables. This lets you increase your computer power simply by adding another system to the network. Without reprogramming.

Sycor's security-conscious software makes sure all disk files can be protected to prevent unauthorized access. You get peace of mind. And costs are kept to a minimum.

Link up your departments with Sycorlink. Call 800-521-2838 toll-free.
Sycor pioneered the concept of distributed data processing more than ten years ago. Since then we've been at the cutting edge of distributed processing technology. With over 100 service centers located within a half-hour drive of 1750 North American cities, and 40,000 systems installed, we're ready to help you bring your users state-of-the-art service in distributed processing. They deserve it.

To find out more about how Sycorlink can help you conquer distributed processing problems, call Tony Fazio, VP Sales, at the number above. In Michigan, call collect, 313-995-1170. Or write Sycor, Inc., Ann Arbor, Michigan 48106.

Better yet, contact a nearby sales office. We're in the Yellow Pages under Data Processing Equipment.

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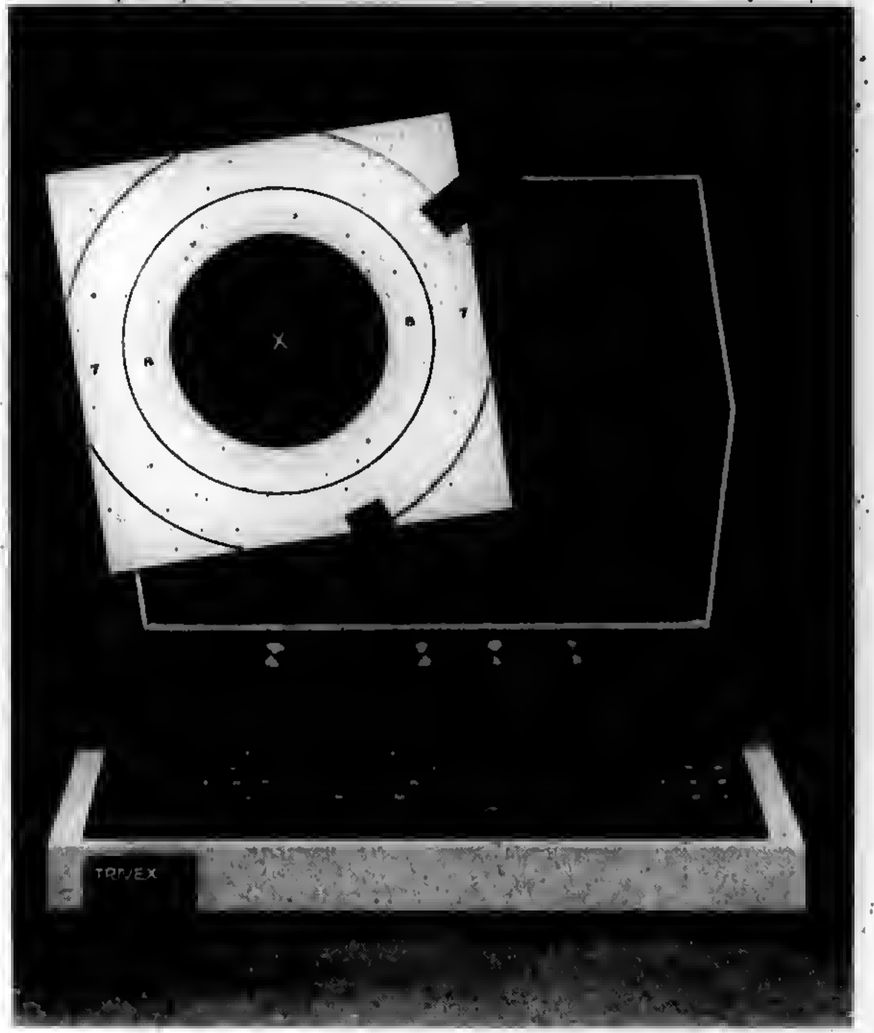
You'd probably like to switch over from your IBM 3270's to more versatile equipment, but you're not ready to bite the bullet. Well, there's a complete terminal system that will make the change painless because it's 100% IBM plug compatible. A terminal system with features you won't get from IBM for years, if ever. A terminal system that can easily provide special functions. A terminal system that's software modifiable to future changes in network line protocol requirements.

The terminal system is the Trivex Plus 70. And in addition to having all the functional capability announced by IBM, Trivex 3270 compatible units offer you those valuable extras that can make your job a whole lot easier.

Maybe you're thinking: "That's fine, but what makes you think my company would be interested? Can it meet the unique requirements of my 3270 application?"



Well, that's precisely where our Trivex Target Test comes in. Check it out. In about 60 seconds you'll know whether or not you should give Trivex a call.

The Target Test

CHECK ONE	YES	NO
1. Does a single device failure take your complete cluster off line?	☐	☐
2. Does a single device failure take your complete channel down?	☐	☐
3. Will remote communication speeds, switch selectable, up to 19.2KBS improve your network efficiency?	☐	☐
4. Do your programmers need more information displayed to efficiently develop and debug software?	☐	☐
5. Are there one or more special functions you need to make your job a lot easier?	☐	☐

Results:
Score 20 points for every "yes" answer. If you scored 20 points or below, you've got nothing to complain about. Don't change a thing.

If you scored 40 points, you may not make the switch yet, but an inquiry is in order.

If you scored 60 points, call us and ask for application information.

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He can tell you about our high resolution, non-glare CRT, OCR wand, and local display-to-print capability. Or you may be interested in our statistical package or 10-key numeric pad or cursor position indicator. Whatever target you're aiming for Trivex can help you hit the mark.

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Don't Replace Your 3270s Without Taking The Trivex Target Test.

Dutch Bank to Start Up X.25-Based Network

(Continued from Page S/2)

activity. As shown in Figure 1, there are no constraints on the directions of message routing, and the network allows processing and distribution in locations other than the existing Amstelveen and Tilburg DP centers, as well as backup processing by one or the other of these two centers.

Although long-term operational experience with Comsys is yet to be gained, Amro has a great deal of confidence in the basic concept of such a flexible, general-purpose network, even in the light of networking developments that have occurred during the two years since the project's inception.

General Structure

Figure 2 shows the general structure of the Amro network in its initial configuration. The dual-processor DS714, located in the DP center, controls the network and provides all the network services. The host mainframe, an IBM 370/168 multiprocessor system utilizing IMS, is linked to the network via Philips P856 minicomputers equipped with special channel adapter hardware.

The hardware/software characteristics of the channel interface emulate two standard 370 subsystems, one for each direction of transmission. This permits full-duplex operation at channel speed and ensures that any forseeable traffic volume can be accommodated. The channel connection has no influence on the operation of the host system; standard IBM interfaces are employed.

The network interface devices are functionally part of the host system, which is connected to the network as a normal subscriber in accordance with X.25 procedures.

In addition to the dafa-link handling software that controls the connections to the DS-714, the network interface devices contain one element of a special access-protocol which applies to the high-speed exchange of information with the host system. Called Philips Channel Access Method 1 (Pcam 1), this element corresponds to a Philips Network Access Method 1 (Pnam 1) element in the host processor; together they control the link between the host processor and the X.25 network interface.

Other Pcam/Pnam protocols will be used with different host processors; they are independent of other Comsys components and can be replaced without affecting the remainder of the network architecture.

The Comsys software in the host system includes the elements required for message transport, as well as message management software which controls the interface with the application programs in the 370.

The relationship between the Comsys functions and the application software is such that absolute message accountability is guaranteed. No data can be lost, either implicitly or explicitly, without notification to the originator, and no data can be multiplied through retransmission.

Terminal Subsystems

The terminal subsystems used in the district offices are Philips PTS6000 transaction terminal systems. Each of the initial 75 terminals can control up to 24 devices, which may be connected locally or via leased telephone lines.

The back-office terminals used in the Amro network are CRT units and entry keyboards, and a wide variety of other types of PTS banking terminals may be incorporated for front-office use.

The network architecture provides a great deal of flexibility in terms of future growth and addition of new services. If justified by line-cost reductions, concentrators may be added to the packet-switching network to reduce the number of physical circuits to the switching node. The network may be connected to others (such as Swift, the international banking network) via suitable interface facilities.

Using a Telex concentrator, connections may be made from the net to the public Telex network. Additional host processor connections may also be made, initially to the existing DS-714 and possibly to new switching nodes, transforming the packet-switching net from a star network to a grid configuration.

User Facilities

The Comsys network is more than a pure transmission and switching facility; it is an intelligent network that provides Amro with a wide range of communications processing services, including data storage and retrieval, logging and statistics facilities, broadcast message distribution and centralized network control. Assumption of many of the network management and control functions by Comsys relieves the host CPU and terminal facilities of these tasks and improves overall system efficiency.

Generally speaking, business data communications networks must provide services to two types of users — line users, the programming personnel who make use of the network to carry out the overall DP function; and staff users, who are the technical personnel responsible for the operation of the network itself.

In addition to its normal data transfer function, Comsys provides a comprehensive range of facilities and services to both these groups. The term "subscriber" as used here denotes an application process. There will always be such a process between the physical user (a person at a terminal) and Com-

(Continued on Page S/18)

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Netherlands Bank Starting Up Private Network

(Continued from Page S/15)

sys; the facilities described are available to the application programmer, who determines whether and to what extent they will be visible at the terminal.

The line-user facilities include message transfer, file storage and retrieval, logging and statistics and service communication.

Message-Transfer Facilities

Tbe message-transfer facilities include two alternative methods: transfer via a normal message circuit, in which case the originating and terminating subscribers are tbe only users of the virtual circuit while the connection exists; and transfer via a dedicated circuit shared by a number of subscribers.

In general, Amro uses normal message circuits for both bulk data transport and interactive traffic, but the free-flowing dedicated circuit may possibly have advantages in future inquiry/response situations, particularly when a public packet-switching network is used in conjunction with Comsys.

All Comsys subscribers have symbolic addresses unique to the system. These are logical addresses connected to specific application processes and are internally related by the system to the physical addresses involved.

The advantage of this technique is that application programs need not be changed in the event of a network reconfiguration or if an application is moved from one part of the system to another. The user thus has the flexibility to activate applications in the devices that are best suited to handle them at any given time or, even more important, to transfer applications from one host or device to another in the case of a failure.

The information to be transported over a message circuit is offered by the originating application program to the Comsys message-handling software in variable-size message segments, with the number and size of the segments determined entirely by the application program. The segment size may be different at the two ends of the circuit, and subscribers may communicate on an unrestricted basis with no concern for the characteristics of the underlying network.

This method has some important advantages: it allows subscribers to exchange messages without setting a maximum message length, permits changes in packet size without influence on application programs and provides an end-to-end guarantee of error-free message transport (such a guarantee is not provided by conventional X.25 protocol packet-switching networks.)

Automatic Code Conversion

Since two communicating subscribers may be application programs running in hardware that makes use of different character codes, Comsys provides automatic code conversion capability. Of course, fully transparent data transport with no conversion is possible also (with binary files and so on)

A number of priority classes may be defined within Comsys; tbe technique used to establish the priority of a data exchange permits network control personnel to control the sessions without affecting the application programs. The use of priority assignment in conjunction with the flow-control facilities available gives the network great elasticity — traffic peaks can be flattened while retaining adequate response times for high-priority traffic.

One of the most important features provided by Comsys is the capability of storing and retrieving batches of information wbich cannot, or need not, be delivered immediately to their destination(s). The possibility of time-independent communications between processes has a number of advantages for both line and staff users and is of particular value when: the destination is not available at the time the originator wishes to transmit; the batch must be transmitted more than once, to different destinations; or the batch must be kept in fail-safe storage for a certain period of time.

Batch Manipulation

In addition to the storage and retrieval functions themselves, Comsys permits the manipulation of batches by means of such facilities as invalidation, destination change, status display and so on.

Comsys provides both line and staff users with a variety of possibilities for the collection of statistical information and the logging of both statistics and messages. Examples of such possibilities for the application programmer include counter logging, event logging and the logging of messages considered sufficiently important to warrant retention.

The system provides an operational interface for the exchange of messages between a line user and the central Comsys operator. An application can send a message to the Comsys operator at the central control location — this may be a request for guidance or assistance from a terminal operator or an alarm message on which immediate action should be taken. The Comsys operator may then send a message from the control position to all, or a selection of, the Comsys subscribers.

In addition to conversations between line users and the central operator, this broadcast facility can be used for such purposes as automatically informing

(Continued on Page S/27)

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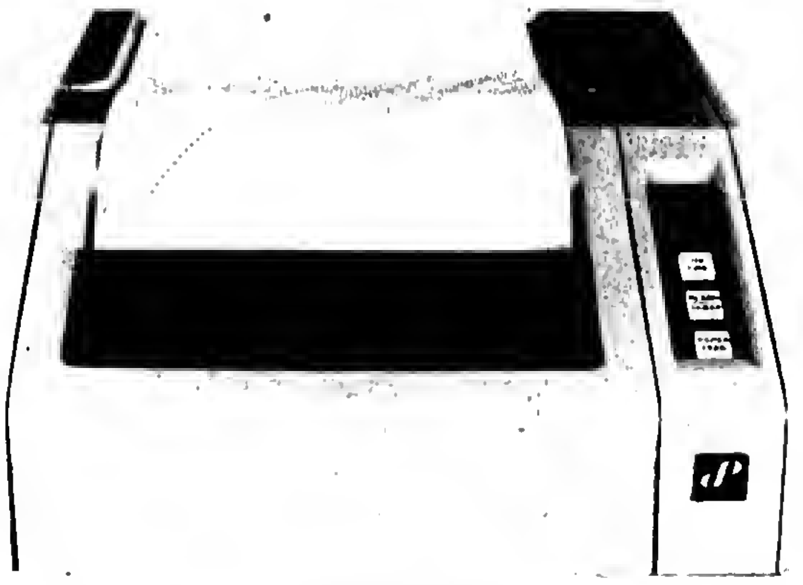

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Integrated Network Helps Firm To Yearly Savings of $600,000

James Mayer and Nilsa Lopez at IBM 3270 in Operations.

DENVILLE, N.J. – On the third workday of the month, Jim Cotting, vice-president and controller of International Paper Co. (ID). gets worldwide earnings information. On the sixth day, he has a complete directors' statement of operations for the preceding month.

That's not bad for a $3.67-billion multinational corporation that at one time was almost completely decentralized.

That three-day business close – down from as much as 17 workdays – is partially the result of the company's integrated teleprocessing network.

Part of a centralization effort started in 1973, the net links 213 locations in the U.S. and abroad with regional IBM 370s in New Jersey and Alabama.

Supported by IBM's Systems Network Architecture (SNA) concept, the network literally makes IP a single company from a data communications standpoint – simplifying all connections between systems, terminals and transmission lines.

The network uses AT&T private lines, operates at speeds from 300- to 56K bit/-sec and uses Codex modems at 4,800-and 9,600 bit/sec.

In addition to the accelerated financial close, the network has yielded an annual savings of $595,000, tightened control of transportation movements and provided a vehicle for on-line order entry of pulp and paper products.

Installed in 1977 after 23 independent data centers were consolidated into two regional data centers, it has even helped move some computing power back to remote locations through distributed processing.

James Mayer, corporate manager of technical development, commented, "In the past, too many projects to improve the flow of information at IP were complicated by technical constraints, particularly in data communications. The network has removed those technical barriers to achieving business objectives."

On Their Own

Those constraints were real enough. In 1973, IP was organized along functional lines, decentralized in DP with 23 data centers and 26 mainframes. Each major location had its own system uses and its own equipment, and there was almost no exchange of information between sites.

"We were truly decentralized, with little effective control," Mayer said. "Each location was basically on its own. Limitations of teleprocessing prevented any real integration of computer functions. Each application included its own communications support.

"To enhance the application – or interface it with similar work at another location – required a change of application software and teleprocessing support, which was usually too costly.

"In addition, the only companywide facility for reporting to headquarters was a teletypewriter network used for message switching. It was an antiquated, unsophisticated, paper-tape-oriented operation wholly unsuited to our needs," he recalled.

Harry Baer, corporate director of information systems, added, "A lot of the developed software was personality-dependent, home-grown, patched and modified. Nobody really knew exactly what was out there."

Move Toward Centralization

In 1976, IP reorganized along the lines of its business units such as packaging products, pulp, paper and oil and gas and minerals. "Our information systems were developed to support a functional organization. When the organization oriented around lines of business, it became apparent that we needed a better means of distributing information on a timely basis throughout the company," Baer explained.

That better way came in two stages:

- The first was a centralization of computing resources to an IBM 370/168 here and two 370/158s in Mobile, Ala.

Baer's corporate management information system (CMIS) department at IP headquarters in New York City planned and coordinated the changes, providing consolidated computing resources to the corporate staff and 79 IP facilities in the U.S.

- The second stage was network implementation. "When we consolidated hardware, we knew there would still be difficulty moving data to and from locations," Baer said.

"We had about 17 people in pure maintenance providing interfaces to remote locations. The company still had mainly single-application terminal types, with no common, standardized teleprocessing software. We needed an integrated teleprocessing network."

Jim Mayer noted, "In addition, the pressure was on to add new applications such as on-line order entry and production scheduling. It was difficult to meet those demands for new systems and worry about getting information to existing locations at the same time."

After evaluating a number of alternatives, IP opted for IBM's SNA to support the network. SNA is basically common teleprocessing software, a simplification of all the technical considerations facing a data communications user.

With SNA, all data transfer concerns such as line protocol, access method and even choice of most economical transmission are "transparent" to the user. For IP, this meant an IBM 3270 display station at

(Continued on Page S/26)

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Packet-Switched Network Provides APL Service

(Continued from Page S/2)

established. It is also used as the left character of the destination selection command. The Ascii character set issue is largely avoided by the absence of special characters in messages from the network.

Former Technique

Prior to the installation of the present packet-switched network, IPSA used older technology to accomplish a similar function. Some of the deficiencies of the TDM technology hastened the conversion to a packet-switched technology.

Telephone lines are a known source of transmission errors. This is particularly true when efficient modems are used. An efficient modem provides a transmission rate (measured in bit/sec) that exceeds twice the bandwidth (measured in Hz) used. Although this gives a rather efficient use of the analog voice channel, a small number of errors (perhaps 100/hour) are introduced.

With the TDM technology of several years ago, most of these random errors tended to be visible to the APL user; erroneous data would be printed on the terminal or sent to APL. Some method of protecting the user from minor errors on the network trunks was required.

The usual method of compensating for short error bursts is to group several characters into a block and to append some redundant bits to the block. The receiver can then perform some arithmetic operation upon the received block, including the redundant bits, to see if a certain class of error has occurred. If the arithmetic operation in the receiver indicates an error, then the receiver requests retransmission of the block.

The Sharp network uses the same redundancy check as does High-Level Data Link Control (x*16+x*12+x*5+1 residue). This gives the ability to detect all error bursts of less than 17 bits and most bursts of greater length.

No Protection in Low-Speed Link

The network does not provide any protection on the low-speed link between the terminal and the network and in some locations this continues to be a source of error. Control of this error source requires some sort of retry protocol between the network and the terminal. Little work has been done in this area by IPSA.

Simple TDM technology dedicates one channel to every port passing over a particular trunk. The channel assignment is made at installation time. It cannot be altered without briefly removing the multiplexer from service (or, as in one extreme case, returning it to the factory).

This fixed assignment of bandwidth can impose limitations on the total number of ports in areas where digital bandwidth is not free. When the entire terminal population consisted of 134.5 bit/sec terminals of the same character length, this was not a particularly onerous restriction. It was possible to squeeze about 15 134.5 bit/sec channels into a 2,400 bit/sec high-speed trunk. The same 2,400 bit/sec can only accommodate eight 300 bit/sec channels.

During the period of transition from 134.5 bit/sec nine-unit terminals to the present 300 bit/sec 10-unit terminals, autospeed presented a further complication. It is desirable to have a single telephone number for both kinds of terminals. With simple TDM technology, it was necessary to have separate telephone numbers and separate channel groups for the two terminal classes. By using a technology without fixed bandwidth allocations, the transition from 134.5 bit/sec BCD to 300 bit/sec Ascii was eased.

Bandwidth Gamble

Packet switching has allowed a bit of gambling on bandwidth requirements. The total dial-up capacity at a remote site can be arbitrarily large. There is no *a priori* bandwidth allocation for a particular port. Bandwidth is allocated on demand exactly as CPU time and file bandwidth are allocated within APL. If an overload exists along a particular route, the symptom is a general slowdown of output.

This is quite noticeable to the APL user, as printing will occur in bursts corresponding to individual packets. This may be caused by a general overload situation such as when transatlantic traffic is running over a single trunk rather than the normal two. An alternative cause is a transient overload resulting from a trunk going out of service for a second or two.

If this happens during a peak period, a transmit queue can build up which will take several seconds to clear down to an innocuous level. Even under light load conditions, a brief service interruption on a trunk will exhaust the end-node buffer pool for a printing terminal. The resulting delay will be noticed by the user.

The location of the pause (mid-line rather than interline) is a side effect of the method of packing APL output lines into network buffers. The educated user can use the location of the printing pause to discriminate between poor performance in the APL machine and network degradation. The observed network degradation may be caused by either an acute or chronic overload. Output is held at the APL machine (or in network transmit queues).

This was considered preferable to

(Continued on Page S/22)

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Sharp's Packet-Switch Net Provides APL Service

(Continued from Page S/20)

loss or corruption of output, and it has also influenced pricing. A 120 char./-sec terminal has a lower priority on transmission from APL than does a conventional terminal. This may reduce the mean print speed observed at the 120 char./sec terminal to less than 120 char./sec. For this reason, imposition of a connect time surcharge on 120 char./sec terminals seemed rather unfair.

If a fixed bandwidth had to be assigned to every dial-up port, it would be difficult to accommodate the number of ports demanded by the typical optimistic branch manager. With dynamic contention for bandwidth, a relatively large number of ports can be installed at a site to accommodate peak connect loads. There is a gamble that not all ports will be continuously engaged in printing. A terminal that is not being used for output requires zero bandwidth.

Packet-Switching Drawbacks

After concluding that simple TDM technology was unacceptable because of the problems mentioned above, some choices still had to be made in a packet-switched environment. Although TDM technology does have certain drawbacks, it also has certain user benefits. If all of the allocated ports are being used to print full speed, it is quite efficient. It can almost always provide very good response time.

Most data transmission systems require some extra bits which are not directly useful to the end user. For example, the asynchronous terminals used with most time-sharing systems have start, parity and stop bits associated with each character. None of these is directly useful to the end user, but they are required by the asynchronous protocol. Similarly, a TDM requires some extra bits to maintain framing synchronization.

A packet-switched system is even worse. It has a redundancy check for each block. Each block also contains addressing and sequencing information to allow it to be delivered to the proper port in sequence. With the present Sharp network packet size, about 50% of the bits transmitted are overhead bits of no direct value to the user.

With a TDM, the overhead content is closer to 20%. The dynamic bandwidth allocation capability of the packet system tends to balance the higher efficiency of the TDM system. Thus, the number of 30 char./sec terminals which can be comfortably accommodated in the packet system is only slightly higher than the number for a TDM system (12 vs. eight assuming a 2,400 bit/sec trunk).

Packet-system efficiency is theoretically easy to alter. The number of overhead bits per packet is fixed for a particular protocol. By increasing the number of useful bits in a packet while preserving a constant overhead, the apparent bandwidth efficiency (useful bits divided by total bits) can be increased. Unfortunately, the need for acceptable response time constrains packet size.

The network currently uses a 256-bit maximum length packet. For a 2,400 bit/sec link, the length-sensitive term in the delay is 106 msec. Thus, the observed delay with one or more 2,400 bit/sec links in the path is rather sensitive to packet length. Doubling the packet length would change bandwidth efficiency from the present .5 to around .75 but it would also increase delay by 100- or 200-msec in certain parts of the network.

Solution to Tradeoff

A possible solution to the capacity vs. response tradeoff is to vary the packet size with the terminal speed and location. A more complex solution would be to use short packets for the first two packets of an APL response and then revert to a larger packet length.

One important design consideration in a packet-switched system is the most likely form of use. For an APL-oriented network, the expected form is point-to-point communications with relatively long holding times. A single port with a connected physical terminal is associated with a particular APL terminal task. Any interaction with other ports in the network will be via APL facilities for intertask communications, rather than through network facilities.

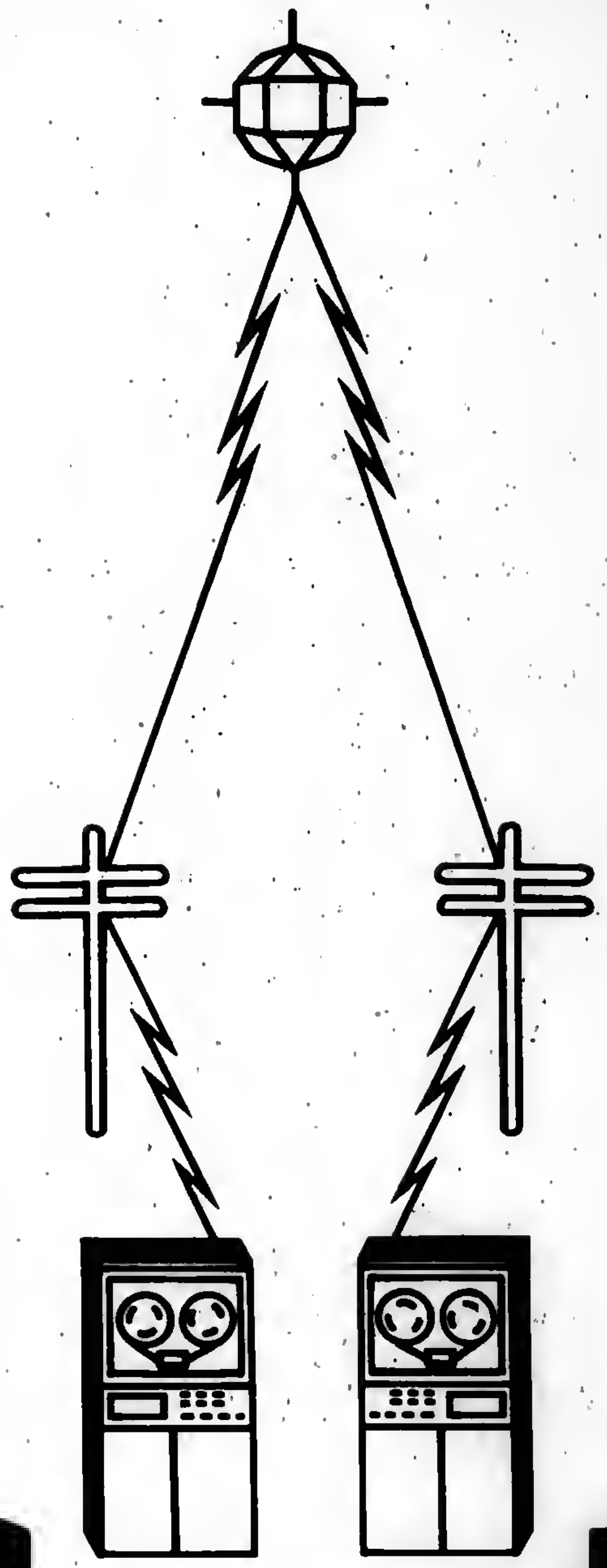
Not all computer networks have this point-to-point property. In particular, a process control system that monitors many different sensors and sends commands to many devices does not have that property.

A network with an orientation toward point-to-point communications is often referred to as a virtual call network. It resembles a switched telephone system in which physical circuits are established and held to accommodate a particular point-to-point call. Certain administrative packets are exchanged to set up a virtual call; this precedes the transmission of any data.

In the Sharp network, this occurs after the initial input line (normally "0") and before the security blot is printed. After the call has been set up, an abbreviated form of addressing can be used. This is possible because there is little need to identify the originator of a packet within a virtual call. There are only two ends to a virtual call; the end that receives a packet assumes it came from the other end.

Datagram Network

An alternative form of organization is the datagram network. In a pure da-



Whether you call it Data Communications, Teleprocessing, Distributed Intelligence Systems, Terminal-based Computing, On-line Systems, Real-time Systems or something else, does not really matter. There are certain fundamentals that are common to all of these systems.

One of the biggest problems with the computer/communications industry is the lack of standardization and the use of conflicting terminology. These factors make it difficult for the beginner to come on board and can even confuse the specialist.

The whole field of data communications is expanding so rapidly that few people have a chance to keep up with what is happening. All too often, day-to-day duties prevent even systems designers or communications managers from keeping fully abreast of some of these developments and their ramifications.

Trevor Housley, internationally known data communications expert and author of **Data Communications and Teleprocessing Systems,** will conduct an in-depth seminar designed to fill that critical information void, presenting a detailed orientation and review of key factors, highlighting developments and their applications potential and significance.

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tagram network, every packet includes the name of the packet originator as well as the destination. In theory, this allows any port to conduct simultaneous dialogues with all other ports in the network. For some applications, this can be useful, but time-sharing does not seem to be one of those.

Datagrams are used within the Sharp network for certain administrative purposes such as call setup and status monitoring. It appears that these uses could be replaced with virtual calls with only moderate inconvenience.

Converting the Sharp network to a strict virtual call organization would provide certain simplifications. In particular, the amount of control information required to route datagrams is proportional to the square of the number of nodes in the network.

In a pure virtual call network, routing information need only be computed and maintained for existing rather than potential virtual calls. This reduces the quantity of routing information to the number of virtual calls times the mean path length. As the network now has around 60 nodes and is continually growing, datagram addressing is becoming rather unwieldy. Changing to a pure virtual call network appears necessary for further growth.

Another advantage of a fixed-route virtual call system is that one of the more unpleasant theoretical properties of a store-and-forward network can be eliminated. Most retransmission and queuing schemes do not provide an upper limit on packet delivery time. It is also possible in some systems for a packet to be lost without the sender being notified.

The usual approach to the lost administrative datagram problem is for the sender to wait a finite time for a response. If no response is received within the time limit, the sender assumes (perhaps incorrectly) that the original packet or the response has been lost.

Unique Call Numbers

With virtual call addressing, a unique call number is assigned to every virtual call in the system. By constraining all traffic to a point-to-point format over fixed routes, two problems can be solved. The packets for a particular virtual call will be stored in the forwarding queues of a small identifiable set of nodes. This is not true for elaborate dynamic routing systems.

When the call is completed or aborted, the packets of the call can be removed from the network. For a call that is being completed in an orderly fashion, the precaution of delaying the call completion signal until the data packets have been forwarded is adequate.

When a node or a link along the route of a virtual call fails, packets are assumed lost and the virtual call must be aborted. An abort signal is passed from both sides of the failure to the endpoints of the virtual call. As the abort signal passes along the route, it has the side effect of destroying any packets belonging to the virtual call.

The virtual call number is then available for reuse, as the previous generation of packets with the same virtual call number has been destroyed.

One other drawback to the existing scheme of routing by node number is that traffic passing between a pair of nodes reachable by independent paths is constrained to a single path. One reason for this constraint is the simple route table organization.

Within each node the route table is stored as a vector indexed by destination node. Each element of the vector gives the direction in which some other node lies.

As the current route table entries are scalars, it is impossible to encode an alternate route.

A more serious problem is the mechanism that aborts virtual calls after a link failure. It is extremely important that both endpoints of an aborted virtual call receive notification of the abnormal call termination.

When this mutual termination requirement is combined with a requirement that calls not using the failed link remain undisturbed, the termination and routing algorithms impose a condition upon the route tables.

The route from A to B can be expressed as an ordered list of intermediate nodes. With the present routing algorithms, a necessary and sufficient condition for mutual call termination after link failure is that the route from node A to node B must be exactly the reverse of the B to A route for all node pairs.

When every virtual call has its own route, the consistency requirement only applies to individual virtual calls. The route from end A to end B must be the reverse of the B to A route for that virtual call. A simple forwarding validation algorithm can guarantee this in real time. Other virtual calls with identical endpoints can be routed independently.

One area of concern in the initial design was maintaining performance in the presence of minor line errors. A transatlantic link running at 7,200 bit/-sec can store four or five unacknowledged packets. Some link management protocols such as X.25 require retransmission of the entire pipeline after a single error. This has the advantage of preserving packet order over a single link.

It has the drawback of exaggerating the effect of a single error. Instead of retransmitting the single corrupted packet, four or five packets may be re-

(Continued on Page S/24)

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Packet-Switched Network Serves Users of APL

(Continued from Page S/23)

transmitted. The Sharp network retransmits only the corrupted packet. This has the drawback of permuting the packet order along the link.

If the various packets in the pipeline were associated with independent virtual calls, this would be of no consequence. The order within a virtual call could be disturbed by retransmission. In a network which uses multiple routing, differing transmission delays along distinct paths can give the same effect. The possible ill effects of order loss are avoided by including an interend sequence number in every packet belonging to a virtual call. The receiving endpoint can then process the packets in the order in which they were emitted rather than the order in which they are received.

APL Interface

The network would be of little value without a connection to the APL machine. Several methods of connection were discussed during network design. An obvious solution would be to preserve the symmetric hardware of a TDM system. At the data center end, data from a single virtual call would materialize on a physical port attached to the network. This physical port would be electrically connected to a Memorex Corp. 1270 terminal controller.

This solution is sometimes called low-speed demultiplexing. It is simple in concept and appears exactly as an ordinary 1270 configuration to APL.

In addition to the obvious problem of requiring large quantities of hardware, low-speed demultiplexing has other drawbacks. The worst is the way in which the entire system is slaved to a 300 Hz oscillator in the terminal controller. Data transfer to and from APL is constrained to a single procrustean speed. There are situations where transfer at a rate which is either faster or slower than the normal terminal speed is desirable.

Running the traffic into the APL machine on a single high-speed line and demultiplexing within the APL machine was contemplated. This was rejected mainly because of the excessive changes which would have been required in the APL software.

The solution which is in use now involves placing a stored program processor between the APL machine and the network. This is a true front-end computer as it is attached directly to a 360-byte multiplexer channel. On the channel side, it looks very much like a Memorex Corp. 1270 or an IBM 2703. Every virtual call uses a separate address on the byte multiplexer channel. The front-end computer can trivially adjust the rate at which data is transferred from APL to the network. This adjustable rate is fairly important in achieving acceptable response time.

When APL starts generating output in response to an input, all of the network buffers for that virtual call are empty. In this situation, data is transferred at high speed over the byte multiplexer channel to fill an initial buffer ration. Data transfer for that virtual call then stops until a buffer has been sent to the terminal.

Another buffer is then filled with data from APL and sent through the network.

This process occurs outside of APL and is not usually visible. The network buffers are independent of APL buffer size and APL output line boundaries.

If the network can absorb output faster than APL is generating it, a partial buffer will be sent. A typical case is the SENT response to)MSG. When APL is generating output more rapidly than the network is willing to accept it, the normal APL mechanism for suspending an output-limited task is used.

Flow control is also useful on input to APL. Sharp APL has retained the 1969 APL/360 scheme of demand assignment of input buffers. The default assumption in APL is that an input line will be quite short. If an input line is longer than expected, extra buffers will be assigned within APL.

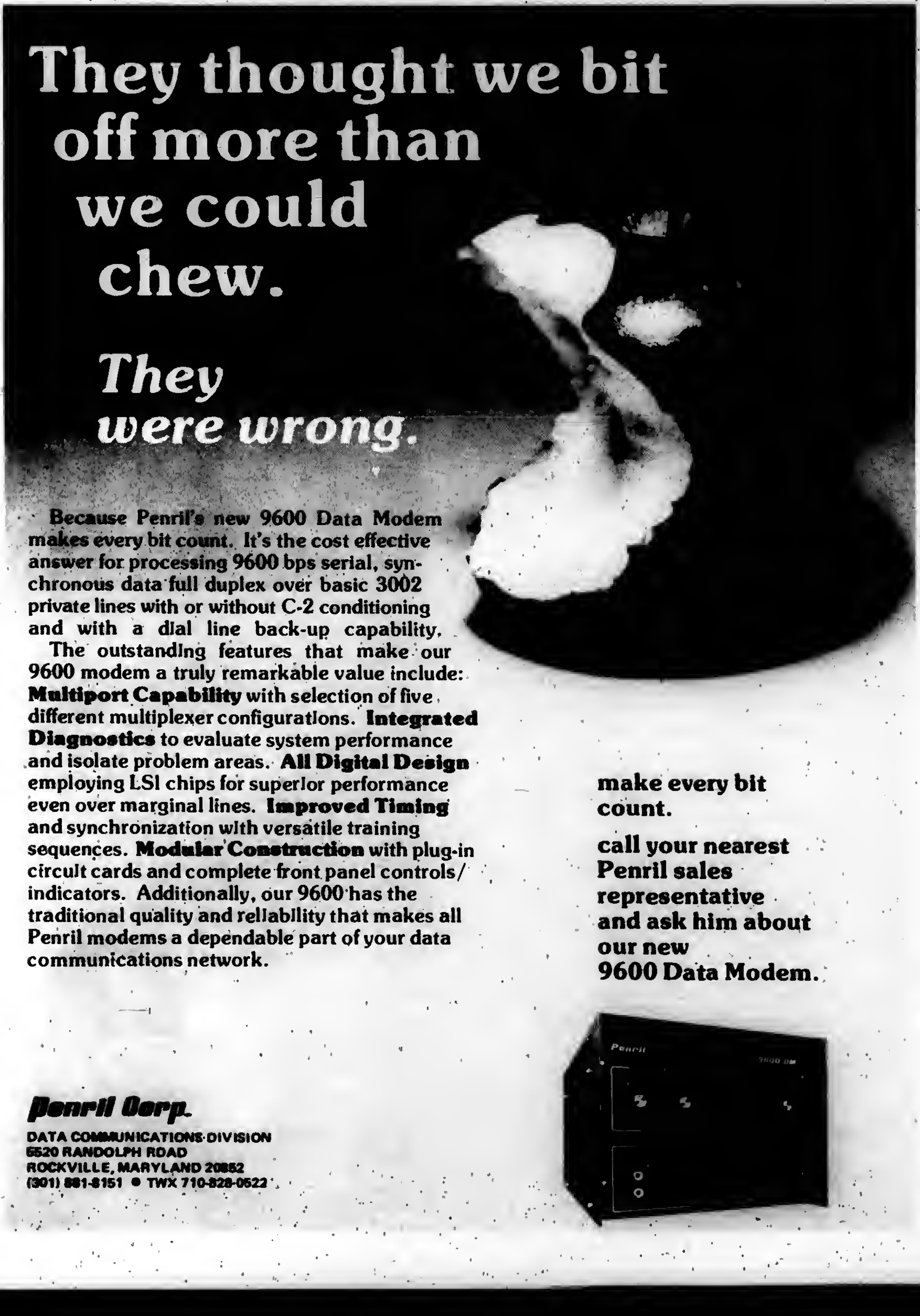
It is theoretically possible for the network to present data faster than APL can allocate buffers. To avoid loss of keyboard input, a method of regulating the rate at which the front-end computer presents data to APL was required. This was accomplished by sending an explicit end-of-buffer signal from APL to the front-end computer whenever an APL buffer is filled.

The front-end computer suspends data transfer for the affected virtual call until the APL machine signals that a new input buffer is ready. This signalling is normally effected by command chaining on the byte multiplexer channel and thus takes less than 60 microsec.

If intervention by APL software is required to allocate a new buffer, the "buffer ready" signal may be delayed for an arbitrary period. The data is held in the front-end computer until the "buffer ready" signal is received from APL. This solution avoided the potential embarrassment of carefully forwarding (and perhaps retransmitting) a packet over the ocean, and then corrupting it with a race condition in the computer room.

Establishment of a new call is another area where a front-end computer was useful. The number of ports in the network somewhat exceeds the number of T-tasks which can be simultaneously supported with the present IPSA hardware configuration. This makes dynamic allocation of byte multiplexer channel addresses desirable.

(Continued on Page S/31)



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(WARNING: there may be more than one right answer to each question)

1. Model 85 is:
(a) a remote information system we first introduced in 1978.
(b) a distributed data processing product.
(c) a multifunction data processing product.

2. Its features include:
(a) multitasking for up to four applications.
(b) large disk capacity.
(c) modular configuration.
(d) more than these.

3. New improvements are:
(a) increased processor memory to 256K bytes.
(b) the addition of remote workstations and printers.
(c) increased disk storage to 100 MB.

4. Model 85 functions are:
(a) remote file management and high level language processing.
(b) on-line file management and stand-alone processing.
(c) batch communications and volume data entry.

5. Available languages are:
(a) RPG II.
(b) COBOL.
(c) ESPERANTO.

6. Model 85 saves users money as an alternative to:
(a) enlarging mainframes overburdened by network interactive applications.
(b) adding communications lines with greater capacities.
(c) maintaining a mainframe configuration only fully used at peak time periods.
(d) losing time and money due to mainframe downtime.

7. For more details on Model 85, you should:
(a) phone your nearest Data 100 sales office or one of the numbers we've listed.

Now check your answers.

All answers but these three are correct.

2a: Model 85 offers multitasking for up to *eight* applications.
3c: 100 MB is old figure; Model 85 is now *245.6 MB* disk storage.
5c: No, Model 85 doesn't speak it. Yet.

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Integrated Net Lets Firm Save $600,000/Year

(Continued from Page S/19)

any location — or almost any terminal for that matter — could be used for communications with the computer.

For example, a person could log onto a 3270 for order entry, switch over to check stock availability and wind up sending an administrative message — all in one session at one terminal.

"The SNA concept lets us design applications as if the entire company were under one roof," Mayer said. "Any terminal can communicate with the mainframe or any other terminal — for more than one application."

With the help of SNA, the net has helpled IP achieve a number of business objectives, including major cost reductions.

"Annual savings are now estimated at $595,000," stated Mayer. "The original forecast was about $240,000. These are direct cost reductions in hardware and lines.

"In addition, new applications go on the same terminals. There's no need to add equipment. That's a cost-avoidance not even included in the $595,000," he added.

Commenting on the three-day business close, Harry Baer said, "We used to prepare directors' statements on the 17th workday after month end. Management wanted financial results sooner. Working closely with the company controllers, we implemented new systems tied into the network and now we get directors' statements by the sixth workday and earnings information the afternoon of the third.

"That's financial information from 114 locations worldwide. We could not have achieved that without the teleprocessing network," he noted.

Reports More Accurate

Another benefit has been a better handle on transportation services. IP is one of the largest users of transportation in the U.S.

Before the network, information on traffic movements was mailed from about 20 key locations to headquarters, then batched for data entry, correction and relay back to locations. Reports often arrived too late to do any good.

But now, the company has a more up-to-date base on movements and more timely and accurate reports, "The whole reporting system has improved," Baer stated.

A major use of the system has been on-line order entry for the company's primary pulp and paper products. Salesmen can enter an order in the sales office, check stock availability at a mill, process the order and get shipment feedback information all at one display terminal.

Marketing data is stored on one regional mainframe, manufacturing data on the other.

Data flows freely from one 370 to the other and between terminals. As far as the user is concerned, all applications related to order entry are tied together.

"It has improved customer service," Baer said. "Our people respond to inquiries faster, we get information to the mills faster and we put manufacturing schedules together quicker.

Before, retransmission of data and enormous clerical effort resulted in roughly a one-in-five error rate in order entry. Now the error rate is insignificant, much less than 1%, even though the number of transactions a day has nearly tripled," he added.

Another plus to the network and SNA has been a productive reversal of IP's trend toward centralization — via distributed processing. The company has already offloaded some processing to remote sites. Eighteen IBM 3790 distributed processing systems have been installed at one division's plant locations, with a total of 30 expected by the end of 1978.

Instead of processing all data at regional data centers, plants do remote editing on 3790s for roll stock inventory, general ledger, accounts payable and other financial applications. The host 370/168 here provides major customer and item file data and network support.

"SNA lets us integrate distributed processing into the teleprocessing network," Mayer said. "In fact, the concept lets you interface any IBM SNA

(Continued on Page S/27)

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Dutch Bank to Implement X.25-Based Network

(Continued from Page S/18)

the applications users that the network is closing. The service communications facilities also permit control of terminal test programs from the central location.

Network Control

The services provided by Comsys to operating and supervisory personnel — the staff users — were designed to permit efficient day-to-day management of the network. The complete network can be controlled, configured, monitored and tested from the central location. As noted earlier, the staff user is provided with comprehensive statistics gathering and logging facilities and with the means for communicating with subscribers.

The central network control facility lets staff users perform the functions required for operational control, configuration control, failure handling, collection of quantitative information about the normal operation of the system, chronological surveys of certain system activities and information on error situations. A duplicated network control data base is maintained at the control center, containing a complete record of the current identification, status and interrelationships of all network components and users.

Each entity in the data base is defined in terms of several attributes. A staff user, for example, is identified by a password and a function key which specifies the system functions to which he has access; a subregion in the network structure is defined in the data base in terms of its internal and external identification, address, activity state and so on.

Control Commands

The network controller has an extensive set of configuration control commands with which new entities or attributes can be entered and existing ones queried, altered or deleted. Complete administrative control of the network may thus be exercised from the central location without the need for Sysgen procedures.

The first Comsys installation is dedicated to banking, but in the opinion of the Amro Bank, the system is suitable for application to a wide range of data communications requirements in commerce, industry and government. The standardized interfaces and modular, clearly layered internal structure of the system permit adaptation to different environments with a wide variety of functional and performance requirements.

Van der Toorn is manager of data communications with Amsterdam-Rotterdam Bank N.V., Amstelveen, the Netherlands.

Net Brings Big Savings

(Continued from Page S/26)

terminals to the network. There are no teleprocessing facilities at IP not part of the system at this time."

That includes about 50 IBM 3770 terminals used for message switching of administrative traffic such as reservations. With the 3770, IP has removed the last vestige of its paper-tape teletype writer network.

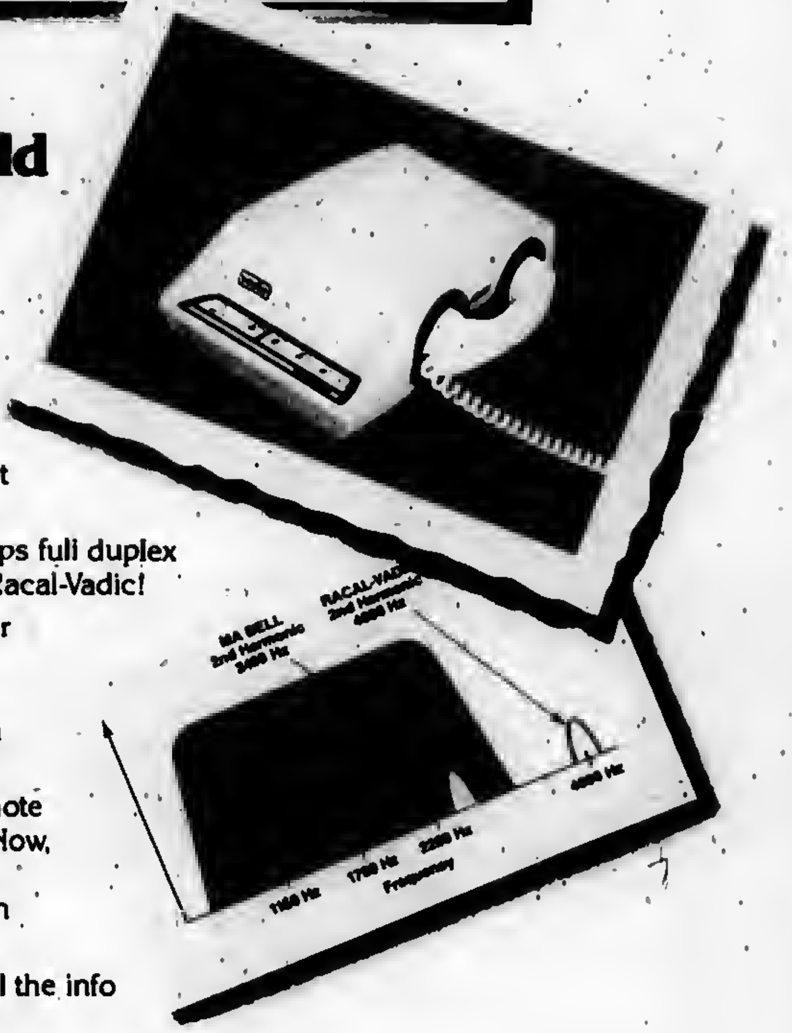
Any IBM Terminal

The network permits message traffic on any IBM terminal. For those locations without such a terminal, IP has replaced teletypewriters with the 3770 teletypewriters. Some 160 teletypewriters have been eliminated. The network now has 160 3270 CRTs.

One of the surprising results of IP's integrated network is consistent response time of three to six seconds. Despite growing volumes, the company has managed its system resources most effectively.

Has the effort to integrate computer functions at IP been worthwhile? The network has cut direct costs almost $600,000 a year, and because new applications can run on existing equipment, there is built-in cost avoidance.

At a time when information becomes one of a corporation's most valuable resources, IP has determined how much of that resource it needs and is finding ways to use it effectively.


MA BELL 2nd Harmonic 2400 Hz
RACAL-VADIC 2nd Harmonic 4500 Hz
1150 Hz
1750 Hz
2250 Hz
Frequency
4500 Hz

Dear Ma:

How come Racal-Vadic can build a 1200 bps full duplex acoustic coupled modem and you can't?

When Racal-Vadic invented the VA3400 way back in 1973, they purposely chose to transmit data in the originate mode at 2250 Hz and receive data at 1150 Hz. They were really thinking ahead, Ma, because these frequencies place 2nd harmonic distortion (created by non-linearity in the telephone microphone) at 4500 Hz — well away from the coupler's received signal.

This wise choice of frequencies has made possible a 1200 bps full duplex acoustic coupler—the VA3434, which is now in full production at Racal-Vadic!

Why in the world, Ma, did you reverse the frequencies in your 212A? By transmitting at 1200 Hz and receiving at 2400 Hz, the 2nd harmonic of your transmitted signal falls right in the middle of the received signal, making the design of an acoustic coupled 212A an engineer's nightmare.

So Racal-Vadic has done it again, Ma. The real winners are remote terminal users who no longer have to settle for 300 bps operation. Now, merely by replacing their present coupler with the VA3434, they can operate at 1200 bps full duplex, while retaining the portability that an acoustic coupler provides.

Suggest that you phone or write Racal-Vadic today, Ma, for all the info on the VA3434 1200 bps full duplex acoustic coupler.

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Distributed Net Helps French Bank Grow . . .

(Continued from Page S/3)

isting administrative core:

- At the top of the hierarchy is the Paris DP center.
- At the next level, performing about 30% of the daily batch processing and acting as backup for the Paris center, is the Aix-en-Provence DP center.
- At the next level are over 200 regional centers, which operate like small banks with a number of branches under them. Because bank management did not want to impose a reorganization of the banking structure on top of a DP system change, the distributed system was designed to have a remote processor at each region.
- Each region, in turn, serves an average of about 10 branches, each of which has a terminal controller and an average of about five terminals for a total of 10,000 terminals in the system. The terminals are nonintelligent CRT-type units with printers attached. Application and control logic resides in terminal controllers for first-level control and in regional processors for secondary control.

Terminals are on-line to the regional processors via controllers. During the working day, tellers use the terminals to verify account balances, record deposits and withdrawals, perform end-of-day balancing and so on.

Selected information for each customer served by a branch is stored on disk at the regional level. During the day, these records are updated online and the same transaction forwarded to Paris or Aix.

Complete Customer File

The complete customer file, located in Paris and Aix, includes account history and full description of banking products used by each customer. The average record length is 1,500 bytes. During the day, this file is accessible by all terminals.

In addition to these inquiries, some updating of specific centralized files is done directly from branch terminals. About one half of total updating transactions come from outside sources — other banks, clearing houses and so on.

All official updating is done by the center systems, at night, on a batch basis. After completion of updates, updated records are transmitted back to the regions.

Interregion Transactions

About 10% of transactions originating within the regions apply to records stored at other regions. These interregional transactions are automatically transmitted to the appropriate regions. As a result, a customer from the south of France can easily cash a check at a branch in northern France.

Reliability and backup within the system have been given high priority by the bank. If a regional processor is down, switches can be thrown to reroute transactions to either Paris or Aix, so these central sites provide backup for the regions.

A terminal controller in a branch could go down, disabling all terminals at the branch. To secure against this possibility, it would be necessary to install dual controllers at the branches, but because of economic reasons and a statistical study (of hardware reliability), this has been left undone for the present.

Designed for Expansion

However, the system has been designed for expansion and these dual controllers are included in future plans. The bank does not think this a problem area because of the controller's simple structure.

Since the regional centers and branches do not need computer operators, Societe Generale is able to significantly lower costs. This has resulted in equipment savings, too, by allowing the utilization of equipment that can operate in an unattended mode.

No local programming capability is provided for the regional processors; programs are controlled and loaded from the central sites. With more than 200 regional processors, an operations and programming staff for each could create a huge expense.

The bank checked carefully into the feasibility of this type of operation before finally deciding on the distributed approach.

Improved service to cus-

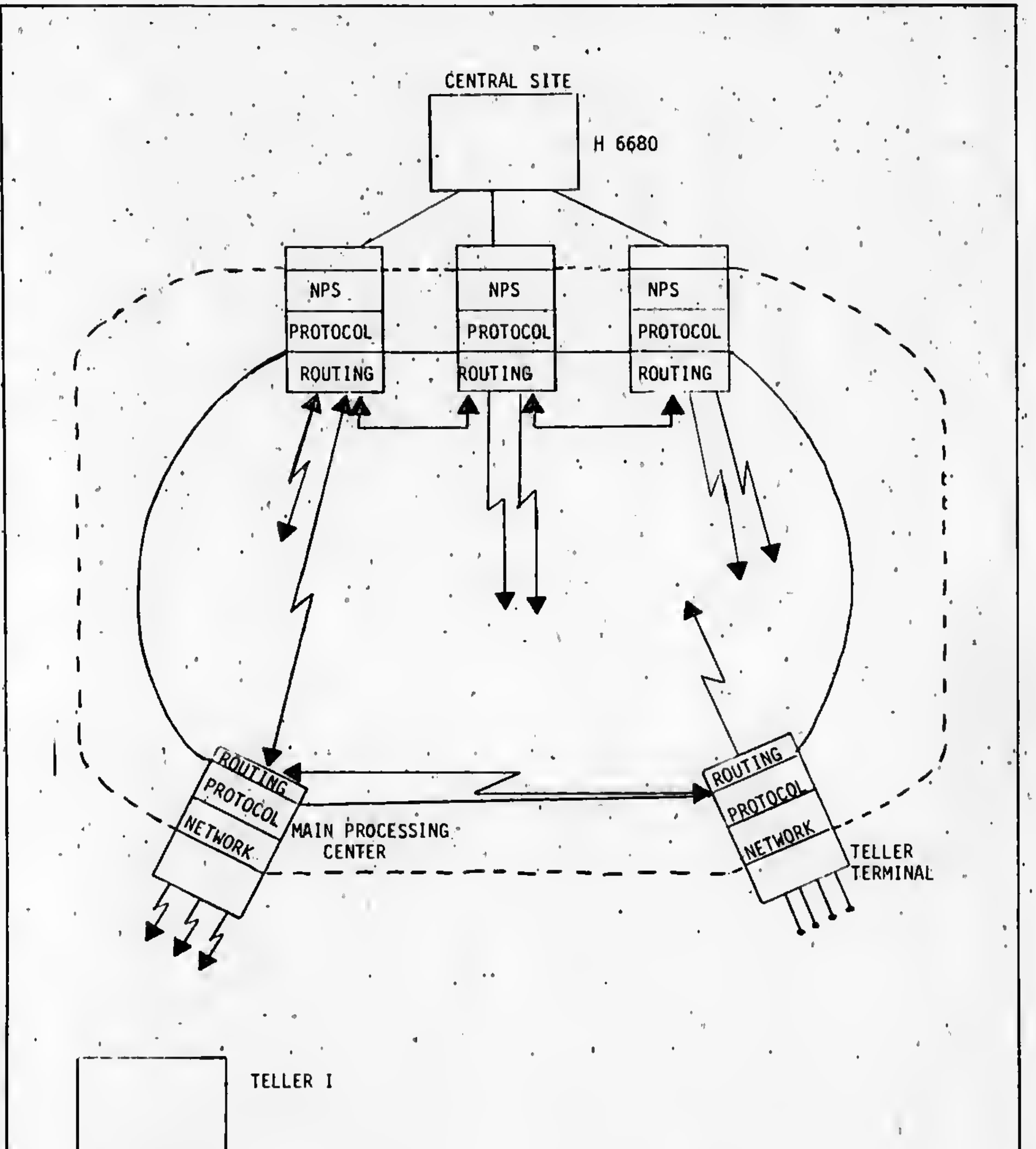

Figure 2. Societe Generale Structural Interface.

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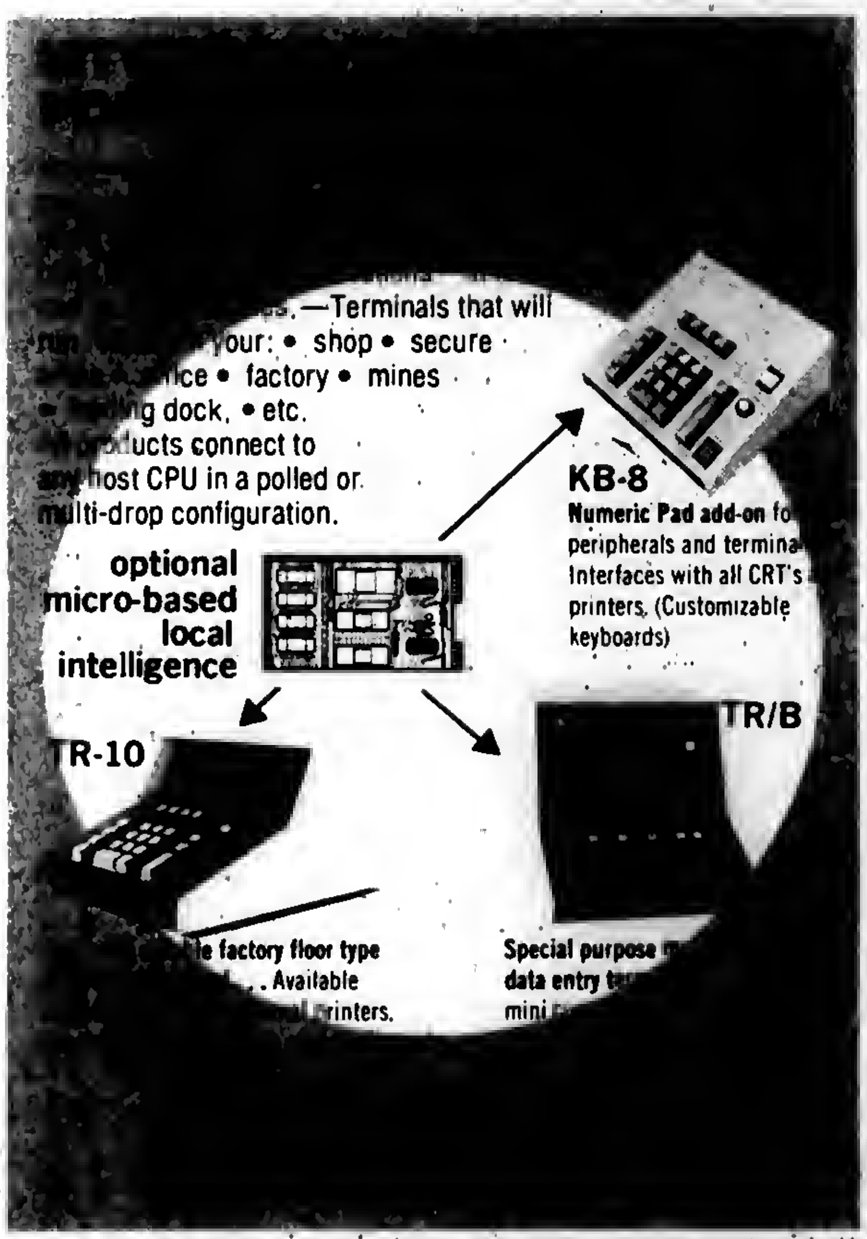

. . . By Coordinating Services at 2,600 Branches

tomers, improved conditions for decision-making, defragmentation of work in branches and reduction in teller's administrative tasks were the main objectives in automating the bank's teller system.

Before SG2 could design a fully integrated teleprocessing system, however, its researchers had to analyze Societe Generale to determine type, quantity and flow of the data to be processed; geographic location of data input points; response time required by conversational data; potential security problems; and role of input points not involving system personnel.

These objectives were constantly related to the bank's aim to upgrade customer services, facilitate decision-making, centralize the system's functions and reduce the time spent on administrative routine.

Three main objectives were defined in the management information system plan: The system:

- Must simplify data acquisition by reducing the codification by the terminal's data input screen masks and through direct gathering of data on terminals, thereby avoiding transcriptions used in batch processing.
- Must provide instantaneous access to files giving only the desired data.
- Must be automated, using point-of-sale (POS) terminals at the customer's offices and automatic teller machines for such things as funds transfer, bill remittance and stock exchange.

Network Design

The bank's redesigned data network is comprised of two day-processing centers (Paris and Aix-en-Provence) equipped with two mainframes (dual Honeywell, Inc. H66/80 processors) linked by a high-speed 56K bit/sec line and 2,000 Intertechnique controllers linking CRT terminals from Sintra, Logabax and other suppliers.

The number of terminals will soon be increased to 10,000 units.

The design of the on-line teleprocessing network system closely copies the management structure of the bank in order to perpetuate the decision-making centers and to allow the system to adapt to local operational demands.

By keeping the teleprocessing system congruent with the decision-making structure, SG2 ensured that the appropriate information would be available to the administrators who need it.

Two types of data bases, one at the main centers and the other at the local levels, manage all customer accounts. The data bases are comprised of information relative to each customer and enable Societe Generale to handle 2.7 million customers, four million accounts, and two million daily transactions.

In operational terms, the redesigned system allows branches to work independently of the DP center and in real time for 80% of their operations. The response time is very short and the system filters out unessential and improperly prepared data from the master terminals.

In concrete terms, the redesigned system, called RTA, enables Societe Generale to handle two million transactions per day at 100 transactions per second. It allows local terminals to handle all usual transactions and incorporate keyboard and display screen equipment.

The number of workstations at a local branch can be varied, with one terminal controller used for every four CRTs.

The system can also be linked with other types of terminal equipment, such as automatic bank note dispensers.

At the main DP centers, the H66/80 dual-processor CPUs have 1,024K words of memory and are front-ended with a Datanet, Inc. 355 with 64K bytes of storage. The regional processors are Honeywell Bull H716s with 64K words. These processors interface with the controller terminals on the local level.

To ensure the security of the system, an automatic surveillance system and decentralized control were implemented.

Kathi Bylander is administrative assistant with SG2 at Suite 1178, 8350 N. Central Expressway, Dallas, Texas 75206.

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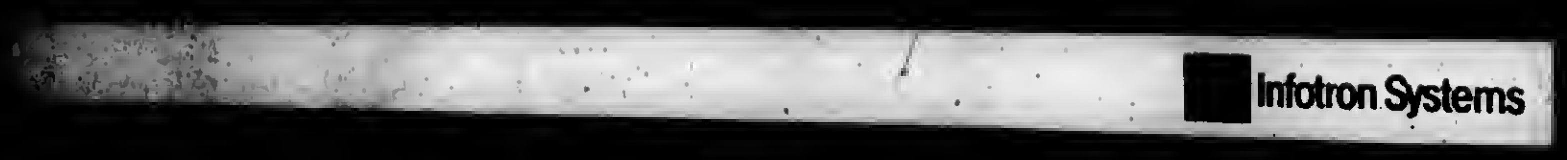

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NEWTON, Mass. — American Fabrics, a wholesaler and importer of drapery, upholstery and decorator fabrics headquartered here provides same-day order shipping services to its customers throughout the country. In order to facilitate that rapid service, American Fabrics depends on what management information systems director Maurice G. Parent calls "a totally interactive business management system."

More than 60,000 transactions per day are entered into American Fabrics' central IBM 370/148 in Massachusetts via sophisticated and efficient telecommunications systems linking the host CPU with interactive CRT terminals and output devices located in major metropolitan areas across the country.

The Los Angeles regional distribution center alone accounts for approximately 15,000 transactions daily.

A Matter of Pride

"We have 16 interactive CRTs in Los Angeles which are used primarily for on-line order entry," Parent said. "That data affects all aspects of our business — inventory, back orders, shipping, accounts receivable and purchasing.

"American Fabrics prides itself on the fact that we can receive an order, process it and update all the necessary files here at the central facility and then output shipping documents at the regional center and have the order ready to go to the customer in less than two hours. Response time is absolutely critical."

By implementing a PIX-II "virtual data link" data communications system from Paradyne Corp. of Largo, Fla., American Fabrics cut CRT response time at its Los Angeles offices from 10 or 12 seconds to less than five, according to Parent.

The PIX-II is a minicomputer-based system that allows IBM 360/370 users to reduce communications costs by linking multiple remote devices to a central host CPU over a single land-based or satellite communications line and to implement Synchronous Data Link Control (SDLC) protocol without teleprocessing software overhead on the mainframe.

The PIX-II system consists of a local control unit (LCU), which attaches to the byte multiplexer channel of the host, and remote control units (RCU) in dispersed sites that can support multiple IBM, IBM-compatible and/or Paradyne devices such as interactive CRT terminals, printers, card readers and tape drives.

All data communications functions are transparent to both the host and remote users and remote devices function virtually in a local mode.

"The Paradyne system was implemented in November to replace a Comten, Inc. 3650 multiline concentrator, utilizing IBM's Network Control Program/VS and Btam software, which previously supported a bisynchronous satellite link to 16 CRTs and two printers in Los Angeles," Parent said.

"Since then we have recognized several important benefits from the system. First, PIX-II operates on an attention-interrupt basis. That is, the CRTs communicate with the mainframe only when they have data to send. The elimination of time-consuming polling procedures has been a huge factor in improving our response time.

"Secondly, by improving our response time, we have been able to achieve better remote printer utilization.

"Third, the Paradyne system allowed us to implement bidirectional data transmission using SDLC without all the grief usually associated with other vendors' SDLC.

"Fourth, we have a mixed communications and systems software environment, and the transparency of the PIX-II system means it can perform its functions efficiently without impacting other systems," he added.

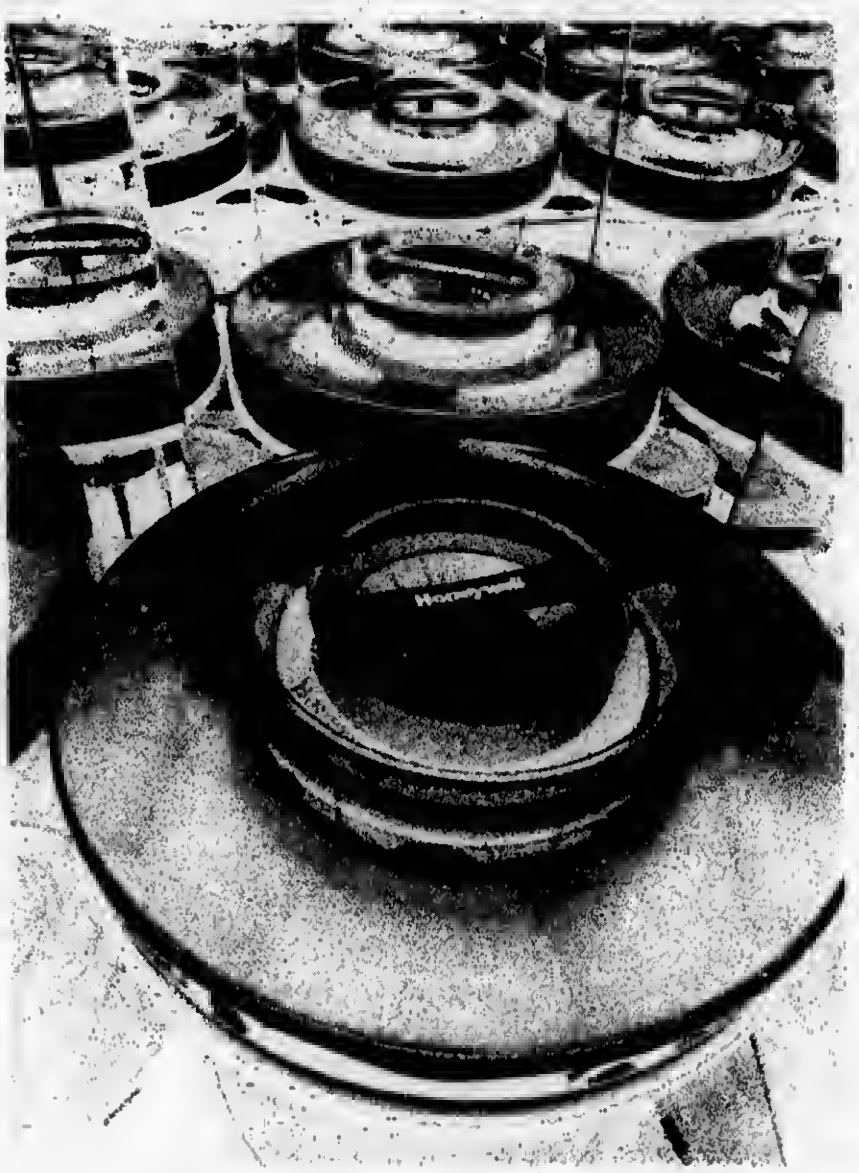
The PIX-II configuration now in use at American Fabrics includes an LCU attached to a 2M-byte IBM 370/148 operating under DOS/VS. The LCU supports an RCU in Los Angeles which, in turn, supports 16 Harris Corp. 8170 interactive CRT terminals, a 165 char./sec printer and a 200 line/-min printer. All of these devices communicate with the mainframe over a single satellite link at 9,600 bit/sec.

Parent explained that the decision to install the Paradyne system came about as a result of steadily degrading CRT response times as more and more devices and applications were implemented in Los Angeles. "When the CPU has to poll 16 to 18 devices and wait for acknowledgements, the overhead is just too high and response time suffers," he commented.

Prior to implementation of the PIX-II system, data communications traffic was increasing as the company added general accounting applications to the high-volume order entry applications, further compounding the problem of slow response time. "It was a situation of too many users competing for the attention of the mainframe," Parent said.

(Continued on Page S/31)

DATA BASE CONTROL.



Satellite Link Lets Firm Cut Response Time

(Continued from Page S/30)

"There were only two alternatives to the PIX-II system: We could have put in a second satellite link at a cost of around $2,100/mo — about the same cost as the PIX-II sysetem. Or we could have upgraded our mainframe for an additional $10,000/mo. But although these alternatives would have speeded our processing capability, they could not have done what PIX-II does — that is, give us faster CRT time," he said.

Remote Printer Use

Response time improvement also resulted in more efficient use of the two remote printers in Los Angeles. American Fabrics prints out management exception reports at night.

"Getting those reports out immediately is critical to our same-day policy," Parent said. "Unless they are printed out and kept absolutely current, there is no way we can respond to customers' orders for fabric in a timely fashion. Many of our customers are smaller decorator or upholstering shops, and the sooner we can get the product to them, the sooner they get paid by their customers."

Under the old communications system, response time on the printers was so slow that when the regular day's work would begin, the printers were still tied up printing out the previous night's reports and couldn't be used for more critical work, Parent recalled. The problem was not with the speed of the printers; it was with the speed at which they received data.

"Binary synchronous protocol only allows one-way data transmissions and it was killing us," he noted. "SDLC allows the simultaneous two-way transmission of data over the same communications link and effectively doubles the transmission rate," he added.

While SDLC offers definite advantages over binary synchronous protocol, including two-way transmission and data transfer rates up to 56k bit/-sec, Parent cited general resistance among DP users to its implementation. Large systems software programs and a good deal of systems programming manpower are usually required to support it in an IBM environment, he said.

"By contrast, we were up and running with the PIX-II system in a matter of hours," Parent said. "The only systems programming we had to do was to write a patch for our CICS teleprocessing monitor software to redesignate the remote peripherals in Los Angeles as local devices.

"That took no time at all, and we have absolutely no software maintenance problem because control of all data communications functions between Los Angeles and the CPU in Massachusetts is handled by the PIX-II LCU and not by the mainframe," he said.

Transparency an Asset

In addition to the PIX-II between Los Angeles and Massachusetts, American Fabrics also uses its Comten multiline concentrator system to support smaller remote configurations in Dallas and Miami.

"In those locations," Parent explained, "the number of peripheral devices requiring telecommunications support and the volume of transactions handled are not yet high enough to require switching to a Paradyne-based system. Those sites have less than half the number of remote devices the Los Angeles site has.

"What is interesting to me," he added, "is that the PIX-II is coexisting nicely with our older telecommunications systems. Because it is totally transparent to both the remote user and host, it has allowed us to continue to use the Comten system under NCP/VS and Btam to support low-volume remote operations.

American Fabrics is currently implementing a second PIX-II RCU, 16 CRTs and two line printers at its expanded Dallas warehouse facilities. Next year the firm plans a third link to its new Chicago warehouse.

"Those planned installations illustrate what we consider to be the criteria for switching from a binary synchronous communications system to the faster PIX-II SDLC — the need for local response time in a high-volume interactive environment at a remote site," Parent concluded.

Net Provides APL Service

(Continued from Page S/24)

When the front-end computer signals a new connection to APL, control information pertaining to the call is transmitted to APL. The terminal protocol (Ascii vs BCD), terminal speed, port location and the user's right parenthesis are passed to APL.

The APL software needs all of the information except port location to communicate with the user's terminal.

Conversion from TDM technology to packet-switched technology has been done with minimal change to APL. Both the internal structure and the external appearance are approximately as they were before the introduction of packet switching. There has been some sacrifice of response time in order to achieve greater reliability and capacity. The greatest present and future benefit is the ability to provide reliable service in many locations.

Moore is vice-president of I.P. Sharp Associates Ltd., Toronto, Canada. He was an implementor of APL/360 at IBM.

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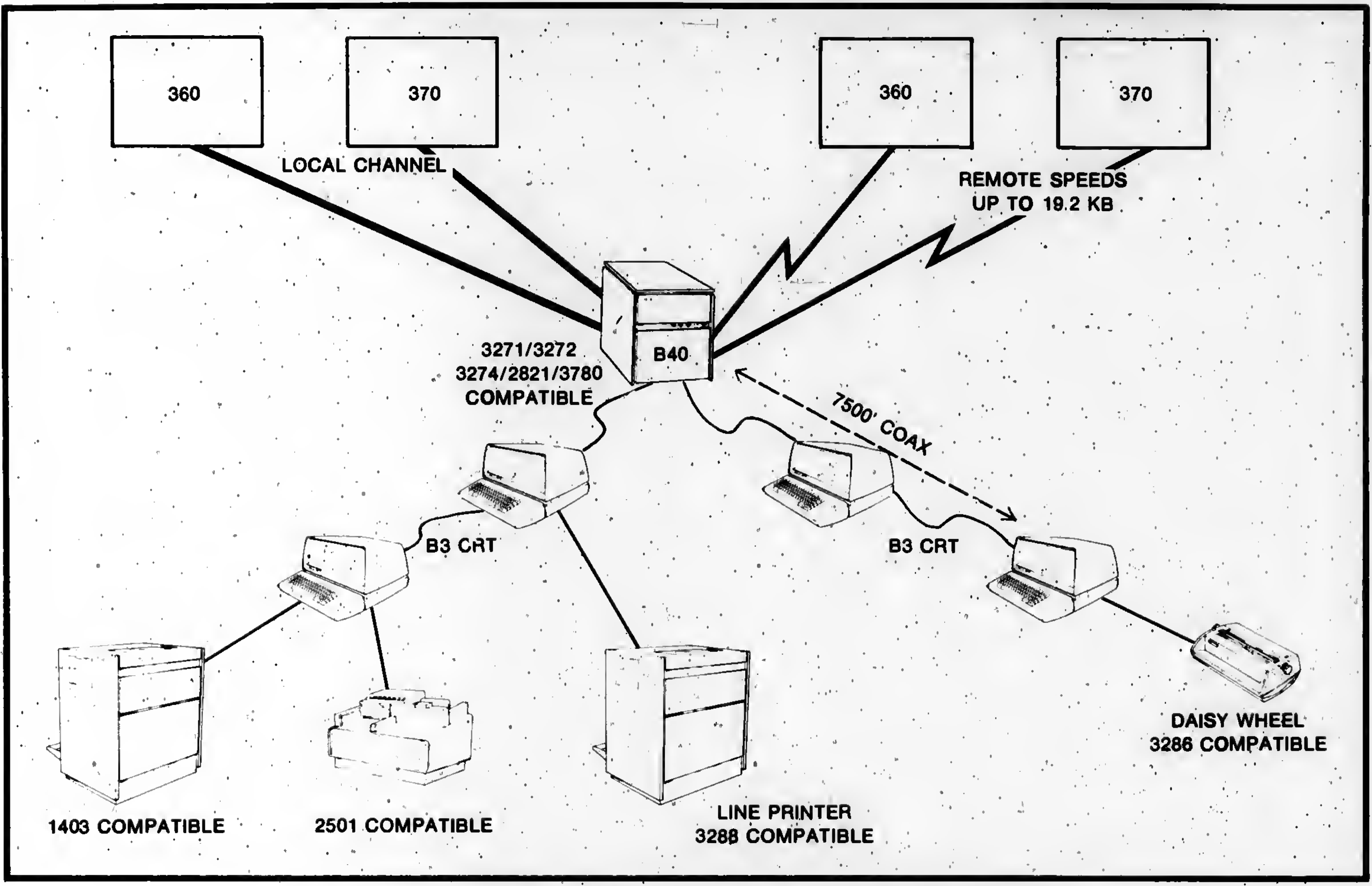
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A Marked Shift in Attitude

Management Entering Age of Master Planning

By Errol Gold
Special to CW

Most information networks have evolved without a master plan, primarily because technology has likewise evolved in a piecemeal fashion, intent upon fulfilling immediate applications needs rather than providing tools with the flexibility to accommodate future contingencies.

The industry has been conditioned to think in terms of decade-long (or less) life cycles for systems, at the end of which it starts over again, admittedly with better tools for doing certain jobs but without the wherewithal or the time to plan and implement a management-oriented network with a life cycle independent of its hardware components.

The development of processors and system software for specific functions such as batch processing, interactive data entry and time-sharing has led to multiple networks that can't be linked together.

Now that there is a strong demand for large-scale communications networks, the user faces a difficult decision as to whether or not to overlay another specialized system over existing systems, thereby generating excess operating costs and inefficient utilization of host computers and communications lines.

New Age

A marked shift in attitudes of large-scale DP managers heralds an age of master planning independent of vendor-advocated solutions. Whereas the DP manager previously viewed the computer as a solution for only the most critical accounting problems, he is now defining systems as tools for day-to-day management of an organization's entire operations.

There is very little talk these days of programmed decisions and a great deal of talk about human interaction with the computer at all levels of the organization to make human decision-making better and easier.

It is the intent here to discuss some of the elements of network master planning gleaned from cooperation with large-scale users.

Master planning is by definition a projection of events over a longer time period than conventional business planning and may encompass a number of alternate business plans. It extends the planning cycle by focusing on organizational purpose. Goals and objectives may change from year to year, but purpose is more enduring.

For example, one of our customers defined the overriding purpose of its network as improving customer service. The specifics are redefined each year, but the network is expected to be responsive to those specifics, whatever they may be.

Another DP manager was called upon to support a total restructuring of the way his company does business on a global level. He cannot afford the luxury of wondering what happens if the company makes a major acquisition five years from now or if the marketing department launches a major campaign in Africa.

His purpose is to be prepared to move information from any given point in the world to any other. If there are gaps today in technology or products meant for tomorrow's job, the master plan does not skirt them; it defines them, puts a timetable on them and calls for an ultimatum to the vendor community.

First Rule of Planning

So, we might conclude that the first rule of master planning is hardware/software (vendor) independence.

This statement then presupposes that:

- Incentives for developing and evolving future network technology will come from the user community, not from manufacturers.
- Users will not be limited to using one vendor's product line exclusively.
- The long-standing manufacturers' practice of "locking out" other vendors will gradually disappear. This applies as equally to peripherals and telecommunications equipment as it does to computers.
- Network architectures uniquely styled to accommodate one vendor will become a risky investment.

The fact that IBM supports and assists other vendors in tying into its Systems Network Architecture (SNA) assures that this is more than a trend. It is surprising that other mainframe and minicomputer firms have not made more of this issue, because there may be room for multiple architectures in the grand scheme of networking, providing they all work together.

Forsaking Top-Down Approach

The second most important element of network master planning is that implementation doesn't have to be linear, providing that all of the components are compatible or can be made compatible."

You can start in the middle, at the nodes or at the mainframe, whichever best serves the organization's purpose. This is evidenced by the fact that some SNA users will have their networks 50% to 85% installed before all of the components of SNA are fully de-

(Continued on Page S/34)

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CENTRONICS' PRINTERS
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Master Planning Means Looking Further Ahead

(Continued from Page S/33)

bugged and released.

This departure from top-down architectural design approaches is practical for a number of reasons.

First, if the distributed network processors support concurrent local processing and local data bases (as they should), they can start paying for themselves before they go on-line to a mainframe. In fact, for that previously mentioned user who emphasizes customer service, the remote site with its local files is far more critical than the mainframe because that is where the organization interfaces with its customers.

Second, if the network is truly transparent to the terminal user, then he doesn't really know how much or what parts of the network are up and running as long as requirements for the task at hand do not exceed his training to date and the network resources at hand. Maintaining that balance from beginning to end of implementation is a function of master planning.

Finally, if the user has a large investment in existing equipment and software (as he usually does), it is to his obvious advantage if a large percentage of that investment can be transferred either permanently or temporarily to the network under development.

One user candidly confessed that he would not have gotten his network off the ground without being able to use some existing equipment, even though that equipment is not part of the ultimate master planned network. Another advised us that he can get by for two or three years by using dial-up batch transmissions from remote processors of different vendors, freeing a portion of his limited budget to solve more pressing management problems.

Yet the user has not sacrificed his future potential for interactive mainframe communications. These options might not have been available with the top-down approach.

Addressing Contingencies

Another major element of master planning is addressing contingencies beyond the control of the organization. A master plan, as you might suspect, contains a number of "if-then" statements. But whatever the "if," the "then" has to leave the manager with a feeling of security for the many millions of dollars being committed to network development.

What if:

— a new generation of superfast bubble memory mainframes emerges?

— national telecommunications policy in Canada forces use of a nonstandard protocol?

— we enter a new round of legislation on computers and privacy?

— the network control center gets overloaded as more channels are opened and remote sites activated?

— public and private communications facilities continue to escalate in cost?

These kinds of questions, added to the sheer logistical complexity of a large network, prompted one of our customers to say that the old "40-20-40" formula in planning systems was not valid for networks. That formula simply means allocating 40% of resources to preplanning, 20% to implementation and 40% to follow-up. A more appropriate ratio, he said, is 60-20-20.

Not only are there more contingencies to plan for, but the difficulty in fixing problems after a network is running is magnified by the number of remote systems, the number of terminals, the number of people using the system, the number of applications programs being run and so forth.

User at the Helm

No single vendor is likely to point out such potential constraints and contribute independently to their resolution unless the user first defines the requirements and establishes a new basis of competition that focuses on where the user wants to go rather than what the vendor has on the shelf.

Budgeting Is an element of master planning that doesn't require any justification, but there is one major difference with the new breed of network master planners that sets them apart: They are no longer considered by their management as an overhead expense or another necessary evil that one must tolerate if the business is to grow.

They are now an integral part of management, delivering tools to solve day-to-day problems directly affecting the conduct of business. As one customer put it: "Sure, we go out to the field, install a system and tell the local manager he can now do his job twice as fast with half the people. But it's his decision; it's his profit center, not DP's.

"He may choose to reduce his costs only through attrition or he may choose to put displaced employees to work doing something else that improves his organization's performance. It's none of our business. Our principal concern is that the manager be prepared technically and operationally to make knowledgeable decisions and, further, to oversee that intersite transactions function smoothly."

Obviously, though, there are still elements of overhead to contend with. According to a fairly comprehensive survey of SNA users by SBS Publishing Co., the most frequently cited disadvantage was underestimated costs, attributed mainly to increased mainframe memory requirements, lengthy and costly training, higher salaries for those trained and, in more than half the cases, an upward CPU migration. A large percentage of respondents said

Looking back. And ahead.

All indications have it that 1978 will go down as another banner year for the computer industry. User spending for 1978 should at least match the IDC — projected $42+ billion, up 15% from 1977. Budgets in almost every major category show increased growth over 1977, and 1979 is shaping up to be a repeat performance.

Our December 25/January 1 Combined Issue Special Report takes a look back at the year in computers, as well as a look ahead for 1979. The *Computerworld* editorial staff will take a break from the holiday season just long enough to give you some hindsight and foresight on topics like:

- *The impact of inflation on computer use and configuration*
- *User-vendor relations*
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And Recognizing the User Organization's Goals

they did not achieve expected line cost savings.

We do not know how many of these users adopted the top-down approach, how many were mixed-vendor networks or how many were early victims of Parkinson's Law applied to systems, but we do know that our customers are accumulating savings at the nodes that just might absorb a lot of the added costs of SNA.

Whereas a few SNA users reported a two-year payback, most ranged up to five years.

Further Implications

Master planning implies, then, multiple return-on-investment analysis, multiple methods of acquisition (rental, lease, purchase), a mixture of private and common carrier facilities and other areas of financial planning — all staged to permit a network to pay for itself as it develops to the greatest extent possible.

Since the subject of an SNA survey was brought up, it is only fair to state that all users agreed that the advantages far outweighed the disadvantages, but further concluded that there is no quick and simple answer to whether SNA will benefit a given installation.

It is also interesting to note that the users' reasons for installing SNA did not correlate with the benefits cited after installation.

For example, centralized network control was one of the least mentioned reasons for switching, but was the most often stated benefit, all of which tends to support the case for master planning.

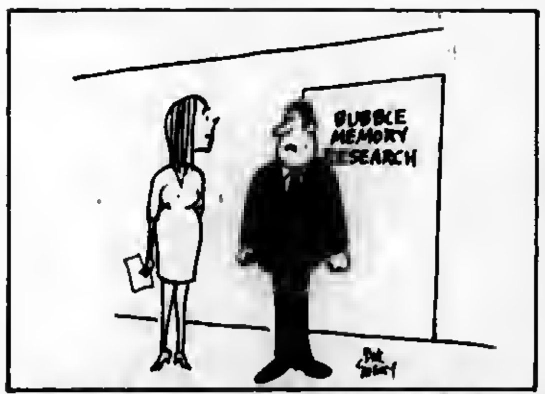
There are many other elements of network master planning, some of which are general and some of which are unique to a particular user. It is an art that might be described as a superset of all the planning functions that go into system definition, hardware selection, implementation and management extended much further in time.

Customer reaction to Computer Automation, Inc.'s master plan for product development has been favorable. Under the plan, products must:

- Accommodate other vendors' equipment — IBM 3270 terminal clusters, IBM 3790 systems, Dataspeed 40/4 clusters, X.25-compatible devices and peripheral devices from many different manufacturers.
- Concurrently support major protocols — Synchronous Data Link Control, X.25, bisynch (2780, 3780, 3270, Hasp/20).
- Allow for centralized control and security — downline loading of software, downline loading of remote diagnostic software, protection of network integrity if any element goes down.
- Aid data base management — permitting users to design distributed data bases which, subject to predetermined controls, provide access to files resident at any location in the network by terminals anywhere else in the network.
- Allow for two independent and concurrent synchronous communications links from each processor, which facilitate interactive data traffic with both the mainframe and other elements of a network.
- Protect against obsolescence. Since all components interface to the network, rather than to each other, any component (including the mainframe) should be upgradable without dislocating the entire network. Distributed processors interface to the network via software and have a library of software emulation packages that keep them flexible to future changes.
- Protect against escalating communications line costs. Local data bases plus node-to-node direct link-up allows users to optimize volume and schedules of traffic. (Dynamic load-leveling algorithms must be developed to produce self-optimizing networks.)
- Protect against overloading the network. The protection will involve a combination of previously noted load-leveling features, distributed data bases, front-end devices and the expandability of the network to further hierarchical levels of distributed processing.
- Provide for advances in satellite technology. Changes will be required in protocols to compensate for propagation delay problems and to take advantage of the broadcast mode of satellite transmission.
- Allow for unlimited growth potential, made possible by interlocking networks, with network traffic controlled by dedicated minicomputers, all totally transparent to the terminal operator.

Such elements of a vendor's master plan can hardly be a secret because they echo the customer's present and future needs. How the vendor does it is his business. That it gets done is the business of user master planners.

Errol Gold is *technical director at the Commercial Systems Division, Computer Automation, Inc., Irvine, Calif. 92713.*



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Charges Microdata 'Unethical'

User 'Misled' Regarding Upgrade Costs

By Jeffry Beeler
CW Staff

BELLEVILLE, N.J. — A user here thought it could afford to make desperately needed enhancements to its minicomputer system until the company discovered recently that a proposed operating system upgrade would cost at least 25 times more than its vendor's original estimate.

Now, the user — Hardman, Inc., an industrial adhesives manufacturer — has at least temporarily abandoned its planned software enhancement as too expensive, and company vice-president John Hardman has accused his vendor of "unethical" marketing practices:

Hardman charges the vendor, Microdata Corp., with deliberately "misleading" him about the full cost and consequences of upgrading from the 2.5 release of the Microdata Reality operating system to the more powerful 3.0 release.

When Hardman first inquired about such an upgrade early this year, he was reportedly informed that the procedure would merely involve swapping one operating system release for another and would cost just $2,500 — a figure even his small firm could comfortably afford. But when he later tried to obtain the 3.0 release, he reportedly found that the local Microdata dealer — Minicomputer Sales and Leasing, Inc. — had neglected to tell him that the upgrade also involved the purchase of a "configuration chip," a programmable read-only memory that had not been required for the older 2.5 release.

Without the configuration chip, he learned, the enhanced software product would prove practically worthless because it would not be able to accommodate any of the memory modules and peripherals he had added to his system since its acquisition a year earlier.

Dealer's Demands

Unfortunately for the user, the dealer reportedly refused to sell Hardman the indispensable configuration chip until he first rebought from Microdata all the expansion hardware he had originally obtained from independent vendors.

To make matters worse, the dealer insisted Hardman buy the equipment at Microdata's own prices, not at the much lower open market prices he had formerly paid.

The dealer representative who reportedly negotiated with Hardman could not be reached for comment on the charges. Microdata, however, denied any wrongdoing in the incident.

If Hardman had complied with the Microdata dealer's demands, the cost of rebuying all his expansion hardware modules would have totaled an estimated

(Continued on Page 62)

Slew of Enhancements, Additions Give Wang Users Upgrade Paths

By Jeffry Beeler
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. extended the upgrade path for a large segment of its customer base when it recently announced a raft of additions and changes to its bottom-, middle- and top-of-the-line systems.

With the announcements, Wang added 11 hardware offerings to its high-end VS systems series, an extension to its low-end PCS desktop computer series and three products to one of its mid-range lines, the MVP.

In addition, the company expanded its VS and MVP configurations and announced assorted price cuts for the high-end series.

Some of the hardware additions to the VS systems include the 2246S serial workstation plus the 22V07 workstation/printer I/O processor (IOP), the 2280V series of fixed/removable disk systems plus the 22V08 disk unit IOP and the 2209V-2 magnetic tape unit plus the 22V05-2 tape system IOP.

The remaining VS series hardware introductions include the 430 line/min 2263V-3 chain-line printer, the 2256 series serial interface and three communications offerings — the 2249V-6 remote cluster controller, the 2246R stand-alone remote workstation and the 22V06-3 communications IOP.

With Wang's recent enhance-

(Continued on Page 64)

Wang recently added 11 products plus main memory and disk unit enhancements to its VS systems line.

Mini Sends Pharmacist Home Without Briefcase

By Marguerite Zientara
CW Staff

HERRIN, Ill. — Ernie LeQuatte no longer has to take paperwork home at the end of the day from the drug store he owns, thanks to a minicomputer that keeps his records current with each transaction.

With a drug store that fills more than 300 prescriptions per day, LeQuatte automated his operations because of the large amount of paper processing that is required in third-party drug prescription programs, such as public aid plans and insurance plans.

For a year and a half, he occasionally visited Midwestern computer companies in search of a minicomputer system that would fit his needs and budget. After evaluating systems from Texas Instruments, Inc. and IBM, he opted for a Honewyell, Inc. Level 6 minicomputer marketed by General Computer Corp. (GCC) of Macedonia, Ohio.

"I looked at GCC's software system and thought it was the most fantastic thing I've ever seen," LeQuatte said. When he first observed the software in action, it was installed in a chain drug store and was running on Singer Co. equipment.

GCC also displayed the system at its offices, where it ran at a faster speed on Wang Laboratories, Inc. equipment. When GCC began putting together a pharmacy-oriented package, Honeywell offered "a good piece of equipment" at a price retail pharmacists could afford, LeQuatte said.

The major benefit of the system

(Continued on Page 66)

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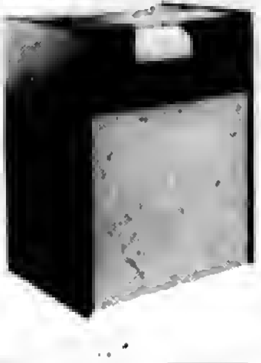
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Fairchild Host Eases Product Tests

CHERRY HILL, N.J. — A host system from Fairchild Camera and Instrument Corp. reportedly allows automatic test networks to concentrate on their main function — product evaluation — by freeing the networks of ancillary tasks like program development, report generation, data display and communications.

Described as a central data base that processes and analyses data from automatic test systems, the Integrator II provides five times more processing power than the Integrator I, from which it was updated, according to a spokesman.

Fairchild credited the performance boost to the Integrator II's floating-point processor, fast Fortran processor and CPU, which consists of a Hewlett-Packard Co. 1000 modified with the company's microcoded instructions.

The floating-point unit reportedly executes single- and extended-processor operations in 4.9 and 6.2 microsec, while the fast Fortran processor is said to speed common Fortran routines by two- to 20-fold.

In addition to an 128K-byte CPU, the system incorporates up to 32 CRT terminals, an 800 bit/in. tape system, a printer and 19.6M bytes of disk storage expandable in 19.6M- or 50M-byte increments to 400M bytes. The terminals can operate as far as 16,000 ft from the system through dial-up or leased phone lines, the source said.

Among its other hardware features, the Integrator II provides an interface for IBM 360 and 370 mainframes and connects to as many as eight concurrent test systems.

Applications software for the system includes data analysis and tester communications packages plus utilities.

A basic Integrator II costs $153,000. It will be available in January from Fairchild's Test Systems Group at 1725 Technology Drive, San Jose, Calif 95110.

User 'Misled' Regarding Upgrade Costs

(Continued from Page 61)

$63,000 — a sum many times greater than the vendor's original price quote and well beyond the financial reach of his 85-employee firm.

As a result, Hardman now finds himself unable to obtain the necessary configuration chip and thus effectively barred from acquiring the 3.0 operating system release, which he says could dramatically improve the performance of his badly overworked system.

Moreover, Hardman's company may be just one of many users who have been similarly victimized, knowingly or unknowingly, by Microdata's marketing policies. "I'm not alone," he warned. "A lot of other Microdata users are also being hurt."

Elaborating on his claim, Hardman accused the vendor of forcing its users to pay "unrealistically" high upgrade charges by preventing them from obtaining their expansion hardware on the open market, where memories and peripherals sometimes cost three to four times less than comparable Microdata equipment.

'Lock-In' Hinges on Chip

To a large extend, Microdata's alleged efforts to "lock in" its customers hinge on its configuration chip, Hardman added. Mounted on a Reality CPU's microprogramming firmware board, the configuration chip controls the amount of core memory, the number of CRT terminals and the amount of disk storage the processor can address.

When Microdata installs one of its systems, the vendor "sets" the accompanying configuration chip to accept only a user's existing configuration. If the user later wants to expand that configuration, he must obtain a new chip that can accommodate the additional equipment.

Unlike most other kinds of hardware, however, the Reality configuration chips are not available from independent sources. Thus, Microdata system users must return to their vendor for all their expansion hardware, or they won't receive the necessary configuration chips, Hardman claimed.

Of course, a headstrong user can still attach foreign memory modules and peripherals to his system if he wishes. But without the appropriate configuration chip, the system's CPU will be unable to address them.

Luckily for Microdata, Hardman added, few customers thus far have objected to the company's "wacky" sales practices — a fact he attributes mainly to user naivete.

"Most users are inexperienced and don't realize they're being locked in," he said. "I'm astonished when I go to users group meetings and see how unsophisticated some of the people are. They're plinking down their money thinking they're buying their way to the future when in fact they're buying the privilege of spending exorbitant sums for their hardware in the future."

Microdata's Response

Responding to Hardman's charges, Microdata's Marketing Services Director Frank Robertson denied his company prohibits its users from going elsewhere for their expansion hardware.

"Of course we want to encourage our users to buy their peripherals from us," he explained. "We don't sell our operating system separately. So we can only make money by selling our software and hardware as a bundled system." Accordingly, Microdata provides its configuration chip free to users who buy all their peripherals from the vendor.

But this marketing policy does not "lock in" Microdata's customers, Robertson added. Users who insist on obtaining their expansion hardware on the open market can still do so. They must, however, pay Microdata a fee for a new configuration chip so that their CPUs will recognize the additional hardware.

Robertson also denied Hardman's charge that Microdata misrepresents its upgrade costs by neglecting to tell users about the price of its configuration chips. "I know for a fact that all our direct sales branches inform their customers about the full cost of our upgrade," he said. "And I assume our dealers do so as well, but I can't say for sure."

In other comments, Robertson questioned Hardman's motives in criticizing Microdata's marketing practices. "He's not just a casual Microdata user," the sales director said. "He's also a used Microdata equipment dealer who has invested a lot of money in his business. Now, because of the introduction of the configuration chip with the 3.0 release, he finds himself on the outside looking in."

Although Hardman admitted being a dealer of used Microdata equipment, he denied his business interests have prompted his complaints against the Irvine, Calif., company.

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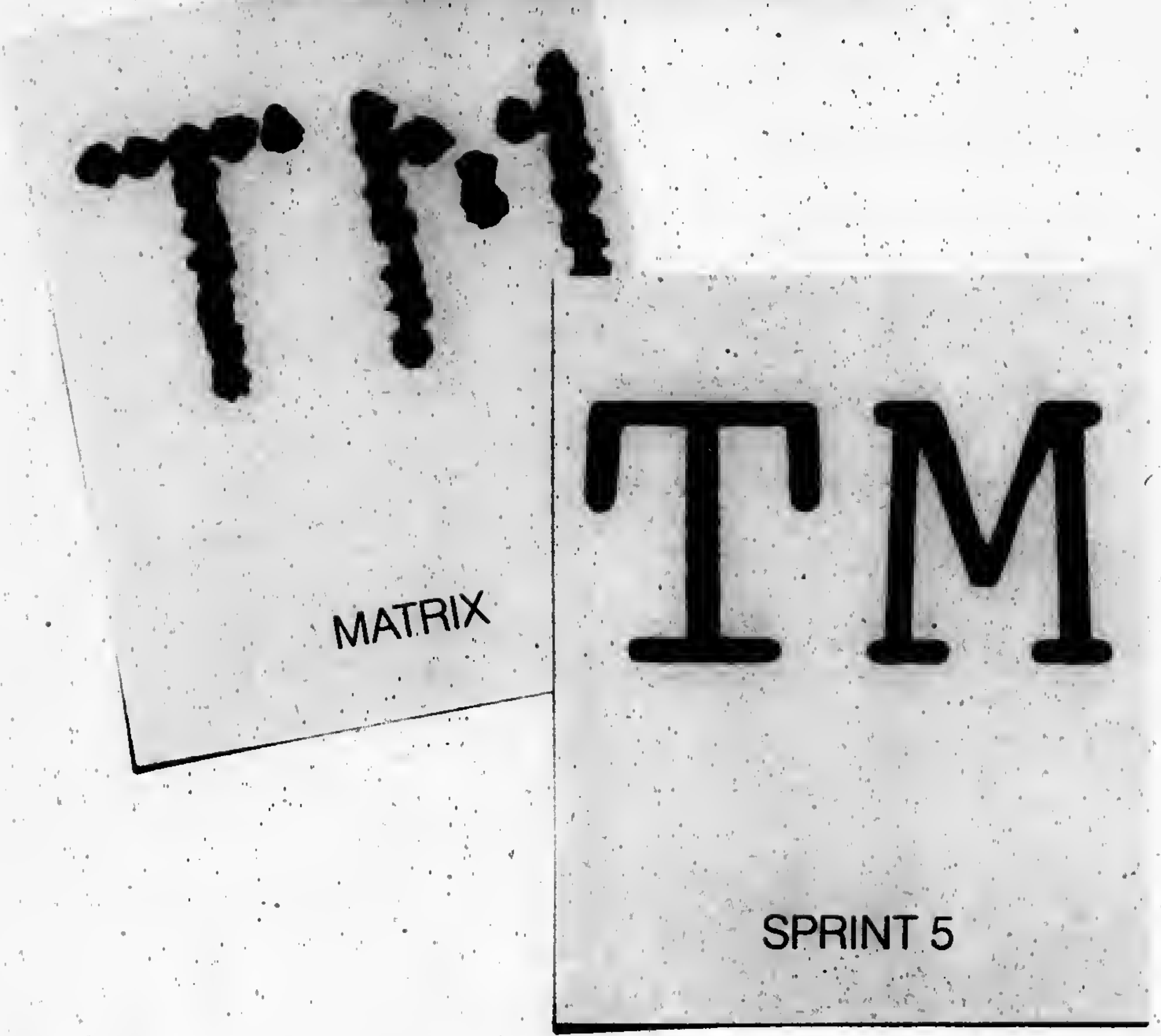

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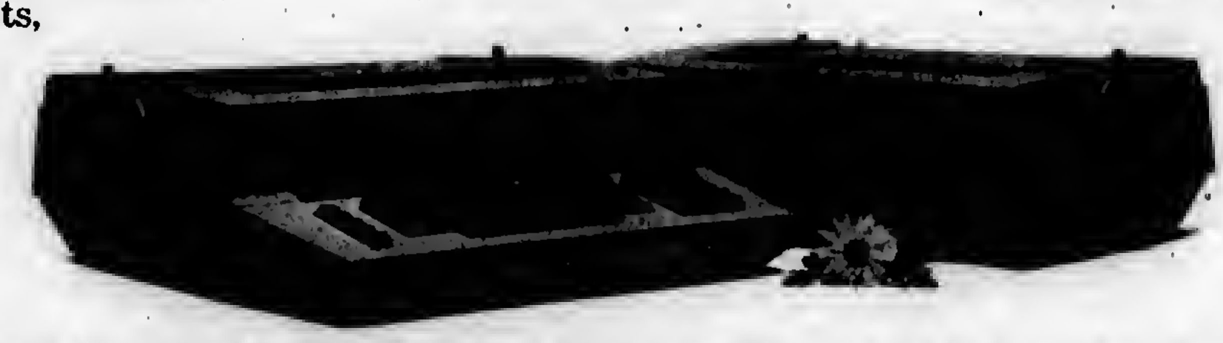

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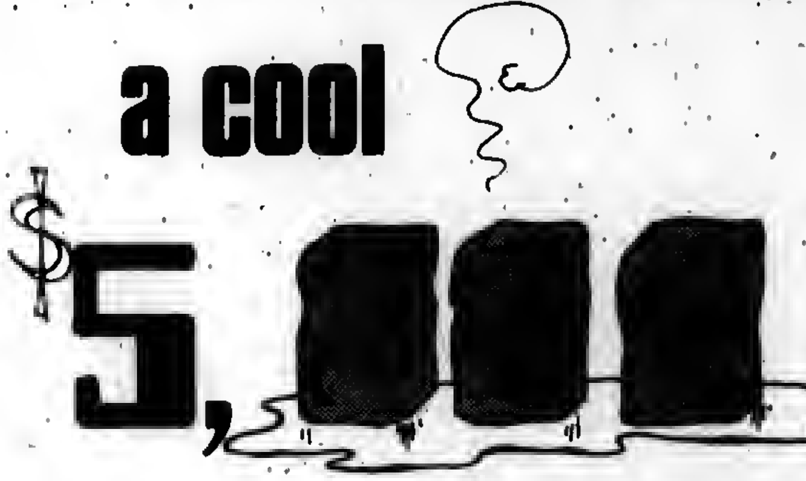

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Wang Offers Upgrade Paths

(Continued from Page 61)

ments, the minimum main memory for VS processors has doubled from 64K bytes to 128K bytes, and the maximum number of terminals the CPUs can support has grown to 32 — a 40% increase.

The company has also enhanced two of the three existing VS disk system models to allow them to accommodate up to 2.3G bytes of formatted storage, a spokesman said. Previously, only one of the disk units stored that much data, while the other two held a maximum of just 150M bytes.

In other VS series developments, Wang cut the price of a 64K-byte memory upgrade from $6,000 to $5,000 and the price of the 75M-byte 2265V-1 disk unit from $20,000 to $19,000.

In the MVP product line, the firm introduced the MVP-A processor chassis and a slightly modified version of the 2280 fixed/removable disk. In addition, the company quadrupled the MVP's maximum main memory capacity from 64K bytes to 256K bytes.

Taken together, these hardware additions and the accompanying enhancements increase the capacity and configuration options available to VS and MVP users and thus help ensure they will not outgrow their upward-expandable systems, the spokesman explained.

At the low end of the Wang product spectrum, the firm equipped its PCS-II desktop computer with a system disk multiplexing capability to produce the PCS-IIA, which can reportedly serve as an intelligent terminal for on-line hosts like the Wang 2200T, 2200VP and MVP.

Noteworthy Announcement

Of all the hardware involved in Wang's most recent product announcement, the single most important is probably the 2280 disk unit series, according to the spokesman. Positioned in the middle of the company's disk systems family, the 2280 series units are believed to be the only mass storage modules in their size class to offer both removable and fixed media.

In the VS series, the 2280 consists of three models: the 2280V-1, which stores a total of 30M bytes; the 2280V-2, which holds 60M bytes; and the 2280V-3, which accommodates 90M bytes. All three provide 15M bytes of removable storage, with the remaining memory residing on fixed media.

In the MVP line, the 2280 series also consists of three models, but they differ slightly from their VS counterparts in total capacity. The 2280-1 stores a total of 26.8M bytes; the 2280-2, 53.6M bytes; and the 2280-3, 80.4M bytes. Each model places 13.4M bytes of its total storage on removable disks and the rest on fixed media.

But despite the differences in memory capacity, both the MVP and VS versions of the 2280 series store 6,000 bit/in. and transfer 1.2M byte/sec with a 30 msec average seek and 6 msec track-to-track access.

The 2280 models 1, 2 and 3 cost $19,000, $21,000 and $23,000, respectively, and will become available for shipment in January. The three VS versions of the 2280 series, by contrast, cost $17,000, $19,000 and $21,000 and are available now.

Unlike their MVP counterparts, the VS 2280 models provide a companion disk unit IOP, the 22V08. Intended as a replacement for Wang's VS 22V03 and 22V04 IOP, the 22V08 controls any combination of up to four 2280V or 2265V disk units. The 22V08 costs $6,000 and, like the split-pack disk unit it supports, is available immediately.

Serial Workstation

Elaborating on its other recent VS series offerings, Wang credited the 2246S serial workstation with using a full upper and lower case Ascii character set to display 24 lines with 80 char./line.

Control for the 2246S workstation comes from the 22V07 workstation IOP, which reportedly supports any combination of up to 16 serial workstations or printers while operating as far as 2,000 ft away. The workstation itself costs $3,200, while eight-port and 16-port versions of the accompanying IOP sell for $3,000 and $4,000 respectively.

Another recent VS series addition, the 2209V-2 tape transport unit, reads and writes at 75 in./sec and rewinds at 200 in./sec, the spokesman said. Capable of storing 800- and 1,600 bit/in., the 9-track unit provides read-after-write verification, automatically corrects single-track errors and comes with the 22V05-2 tape system IOP, which supports up to four 2209V-2s simultaneously.

The 22V05 costs $4,000, compared with $16,000 for the dual-density transport system.

Rounding out the latest VS line introductions, the 2256 series serial interface allows users to connect their VS processors to any other 2200 series CPU, including the MVP, T and VP versions, the spokesman said. The interface costs $1,200.

Desktop Unit Enhanced

Elsewhere in Wang's 2200 series product line, the PCS-IIA incorporates a processor with a Basic interpreter, 8K bytes of user-addressable memory expandable to 32K bytes and 42.5K bytes of operating system memory.

Like the PCS-II from which it was derived, the latest addition to Wang's desktop computer family provides 89.6K-byte diskette units, a 1,024-char. CRT screen, keyboard with numeric keypad and 23 special function keys for data entry and system control.

Unlike its sister system, however, the PCS-IIA offers no multiprinter option. Instead, the system replaces that feature with a disk multiplexing capability which permits the desktop unit to share a data base with larger host processors, the spokesman explained.

Users can upgrade the PCS-II to the PCS-IIA in the field merely by inserting the appropriate multiplexer boards, he added.

Slated to become available by the end of this month, the PCS-IIA costs $4,800 for a minimum configuration.

The MVP-A chassis, meanwhile, incorporates a built-in power supply and must be configured with all subsequent 2200MVP orders calling for a 2280 disk system and more than 64K bytes of central memory, the source said. The chassis costs $500 and, like all of Wang's other recent hardware additions, is available from the vendor at One Industrial Ave., Lowell, Mass. 01851.

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Mini Sends Druggist Home Without Paperwork at Night

(Continued from Page 61)

for LeQuatte Pharmacy has been accurate recordkeeping.

It does our label typing, our patient profile recordkeeping and our third-party billing, as well as accounts receivable," he explained. "For the first time, at the end of the day I can be totally finished instead of having someone take the paperwork home to figure the public aid and write the third-party billing. I know when that prescription is filled that everything is done."

Before the mini's acquisition, LeQuatte's business had grown to the point where he needed new personnel. "The computer alleviated that need," he recalled. "If I had been working with the proper number of personnel, I would have been able to cut back on people."

Family Profiles

LeQuatte Pharmacy's data base contains a profile of each family he supplies with prescriptions. When a patient brings in a prescription to be filled, the pharmacist dials a telephone number to access the individual's family profile, which indicates each patient's identification (ID) number.

By inputting the patient ID number and pushing the "Transmit" button, the pharmacist retrieves a "drug entering screen" on a CRT terminal. Using mnemonics, he then enters a drug name and dosage amount, the number of refills available to the patient, the doctor's initials or three letters of his name and the directions for the patient.

The machine produces a label automatically, prices the prescription and prints a receipt. "And - zap! - it's ready to bill on a billing dump at the end of the day," LeQuatte said.

An added benefit of the system is a doctor-developed drug-to-drug interaction program. "If there are two drugs that will interact unfavorably or if a patient has an allergy to a certain drug, a message will appear on the screen," LeQuatte explained.

'Downgrade' Planned

LeQuatte's configuration consists of a 64K-byte Honeywell Level 6 Model 33 minicomputer and two 10M-byte disk units offering 5M bytes of fixed and 5M bytes of removable storage. That equipment, installed in late August, will give way later this month to a Model 23 mini and a 16M-byte cartridge disk unit with 8M bytes of fixed and 8M bytes of removable storage, according to Richard Pilarczyk, president of GCC, which will install the replacement system.

The Model 33, Pilarczyk said, provides more power than LeQuatte's application requires and is not part of the package offered by GCC.

It sufficed at the LeQuatte Pharmacy, however, until the Model 23 became available.

LeQuatte's configuration also includes a 120 char./sec printer and two Honeywell VIP 7200 CRT terminals in contrast to the GCC package, which provides just one terminal.

The only problem LeQuatte has experienced with the equipment involved a faulty disk unit, which Honeywell people fixed. "They don't know to this day whether [the problem] was caused by something in shipping or whether something was manufactured improperly," LeQuatte said.

Diskette for Micros Offers Double-Density Recording

TORRANCE, Calif. — A 5.25-in. diskette that uses double-density recording to hold up to 200K byte/-surface reportedly forms the heart of a minifloppy disk unit from Vista Computer Co.

In addition to the hard-sectored recording medium, the V200 diskette system incorporates a disk drive, a dc power regulator board, internal power supply, I/O cable and S-100 bus controller card that supports up to three double-density, double-sided drives, according to a Vista spokesman.

Capable of operating with any 24K-byte Zilog, Inc. Z-80 or Intel Corp. 8080-based system, the V200 also provides system software consisting of Digital Research, Inc.'s CP/M disk operating system and a choice of either a standard Basic E compiler or an optional CBasic compiler.

With the CP/M operating system, users can store up to 64 dynamically allocated files on one diskette, the source noted.

Other features reportedly available with the V200 include program loading and dumping.

A V200 package, including hardware and software documentation, costs $699 and is available from Vista's Department P2, 2807 Oregon Court, Torrance, Calif. 90503.

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In-House Beats T/S Costs

Ship Designer On Course With Mini System

GALVESTON, Texas — "We were totally dependent on a system completely out of our control. Our time-sharing cost alone was from $5,000 to $6,000 per month per job. The cost was high enough to prohibit future application development, unless required by contract."

With those words, Dennis K. Medler, director of computer-aided design at a ship engineering firm, explained why his company switched about a year ago from a batch-oriented service bureau to an in-house, interactive minicomputer system.

Under the time-sharing service, the firm — Designers & Planners, Inc. — used a numerical control (NC) system to design and build parts for vessels ranging from sailing yachts and tug boats to destroyers and tankers. Known in the shipbuilding trade as "lofting," the ship-designing process consists basically of drafting a preliminary structural blueprint and then converting that design into templates, or molds, from which finished ship parts are eventually produced.

But when control problems and excessive costs made the service bureau no longer suitable for lofting, Designers & Planners analyzed the available small- to medium-scale computer systems and selected a Model 400 system from Prime Computer, Inc.

Power, virtual memory and ease of operation were the factors in the system's selection, Medler said. "We needed a system large enough to easily convert our large programs with no segmentation. Prime's operating system was flexible enough to let us merge our entire program — up to 50,000 lines of code for one scientific application alone — with no overlays and no segmentation," he added.

Conversion took only half of the expected 10 months, largely because of the system's Fortran software, which proved "easy to work with," Medler said.

Besides the 512K-byte CPU, the Model 400 system incorporates a 356M-byte disk unit, 600 line/min printer, 300 card/min card reader, 10 Perkin-Elmer Corp. CRT terminals, paper tape reader/punch unit and a Tektronix, Inc. interactive graphics terminal.

Since its installation, the system has allowed Designers & Planners to add applications "to a degree we never could have done using the batch system," Medler said. "We can perform such calculations as damage stability, longitudinal strength, stress analyses and weight estimates."

The company is also considering installing a communications network between its Galveston office (where all the NC lofting equipment is located), the New York corporate headquarters and its office in Washington, D.C. This proposed distributed network would let the firm develop computer lofting services at all three locations.

Norwegian Software

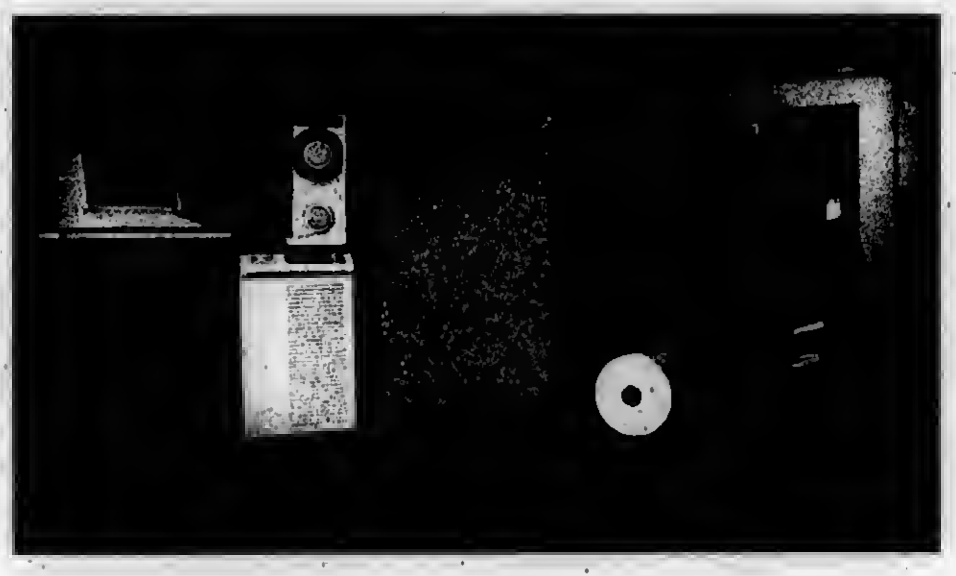
Designers & Planners uses Autokon 71, a shipbuilding software system developed in Norway, to create lofting contours, augmented contours, design parts and production parts. A complete geometric description of each part is stored to create a data base from which the firm can ultimately make "nest-burning tapes" that ensure efficient use of metal by cutting down on the amount of leftover scrap.

Using the Autokon 71 programs converted to the Prime system, the shipbuilding firm can produce an exact mathematical representation of a vessel. The next processing step mathematically fits longitudinal curves such as seams, edges, decks and girders to the frame. Size, shape type and cutout configuration information are stored in the data base.

When all necessary information has been entered into the system, drawings are made using an NC drafting machine that accesses the CPU's plot file. The machine then produces a final line drawing and a body plan.

With lofting or designing complete, Designers & Planners designates and stores all parts, punches the final NC tape and sends it with a marked-up drawing to the burn shop.

The tape then goes into a "burn director" at the flame-cutting site to produce finished steel parts. Each series of perforations on the tape represents either a number, letter or symbol that makes the machine start cutting and bevel torches and make required cuts.



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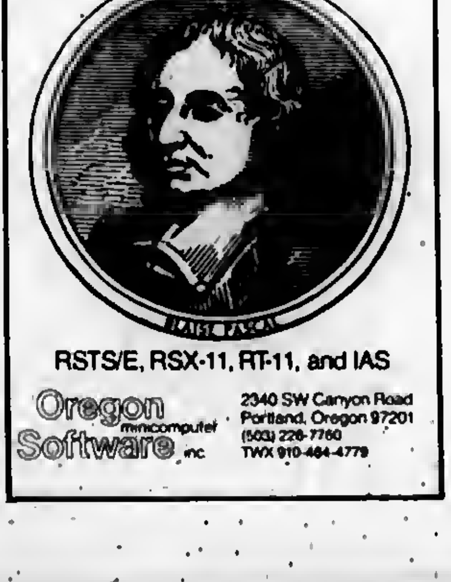

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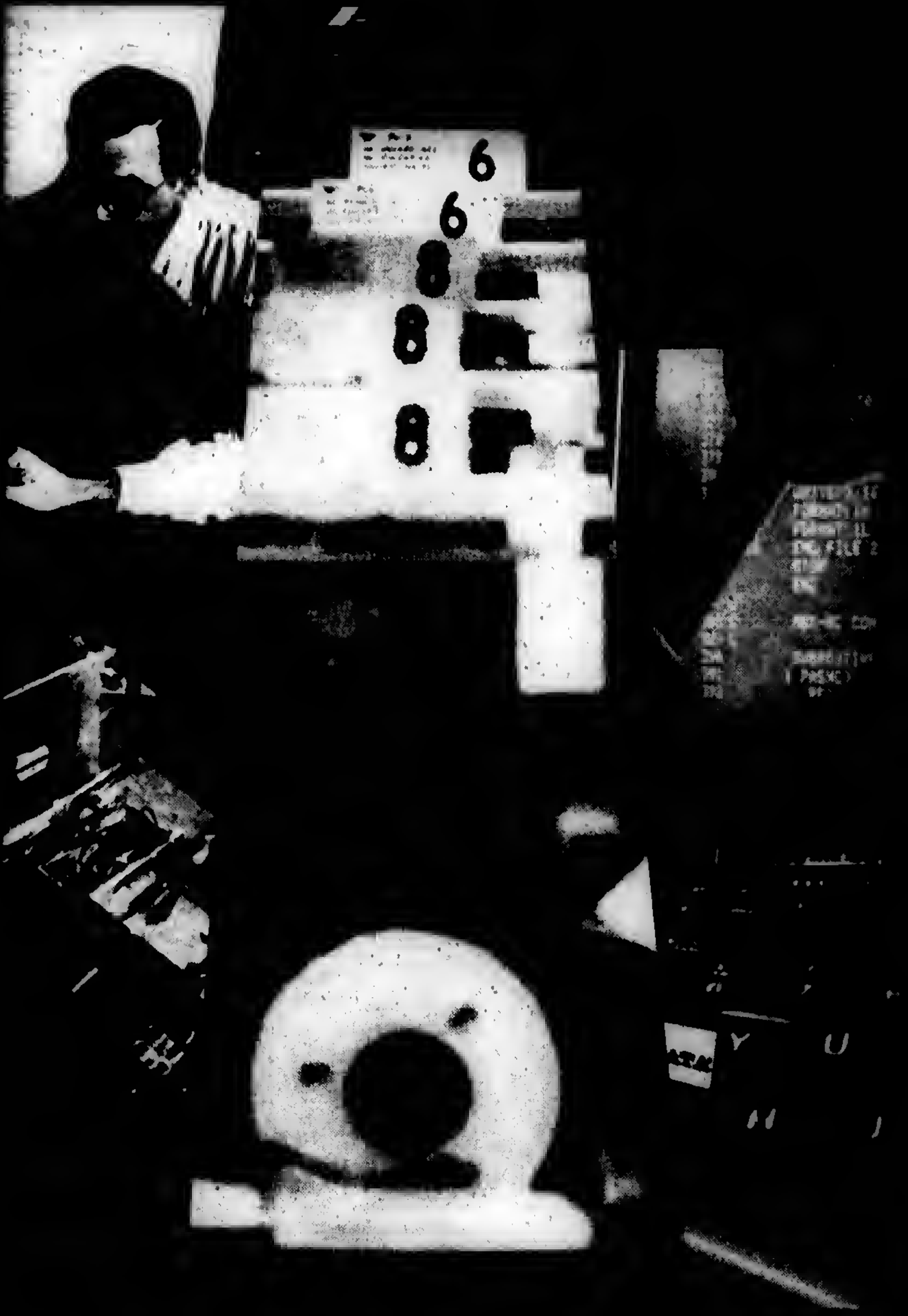

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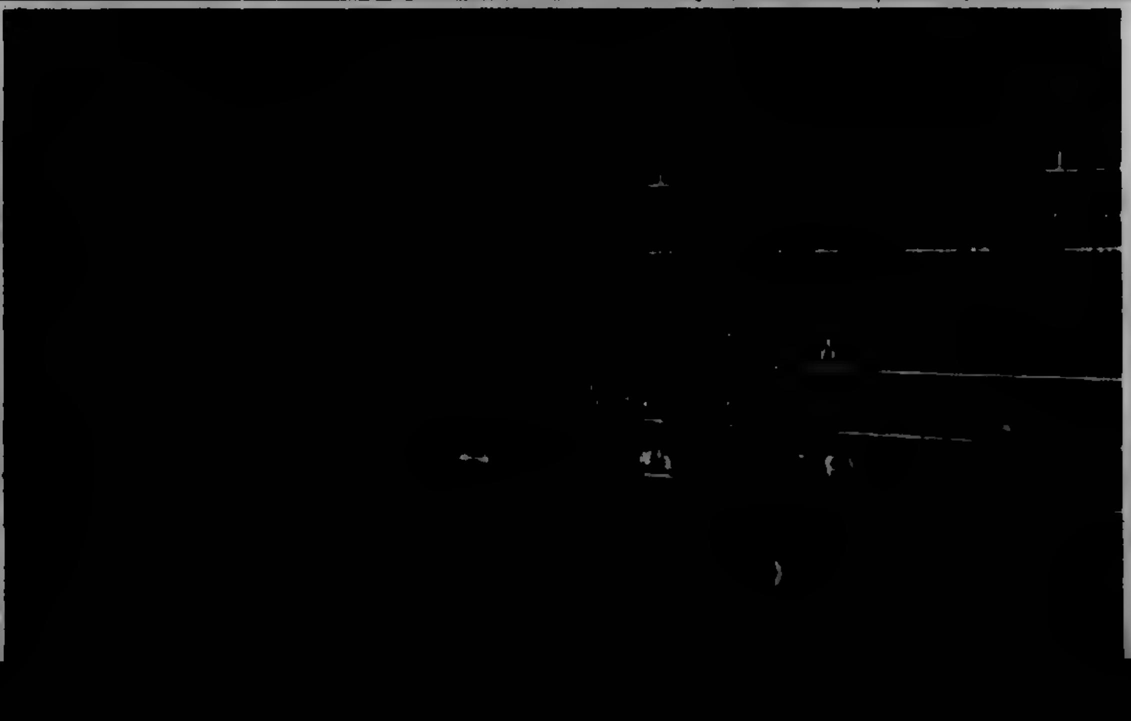

Mini Points Out Excess

Distributor Cuts Surplus Stock by $100,000

MEDFORD, Mass — A chemical distributor here cut $100,000 of inventory surplus after a minicomputer-based system helped uncover that much excess stock.

"In fact, one of our major vendors thought we were giving up his line when we dropped from a truckload per week to one every three weeks," the firm's president, Larry Liebman, recalled.

The user, Doe & Ingalls, Inc., previously used a card-based inventory control system to keep track of the 2,300 different items stocked in the firm's 24,000 sq-ft warehouse. But with 50 to 60 orders and several hundred items being shipped each day, the firm eventually encountered difficulties with the manual system.

Though basically adequate, the system entailed so many control steps that Liebman's office staff of five could not keep up. With a goal of one-day service to 80% of Doe & Ingalls' more than 600 regular customers, the manual system simply fell short of expectations.

It was generally assumed to take three weeks to restock after orders were placed with a vendor but, in practice, up to three months frequently elapsed between the order and resupply.

For this reason, Liebman's biggest problem was "not knowing what we had out on the floor." Some items were overstocked while others were sold out.

Because there appeared to be no simple way to expand the card system to meet the company's needs, Liebman decided to automate not only to meet his immediate needs, but also to realize his projected goal of doubling sales within three years.

Three-Month Search

Hoping to find a ready-made inventory control package, Liebman spent more than three months evaluating products from IBM, Digital Equipment Corp., Litton Industries, Inc., NCR Corp. and Wang Laboratories, Inc. While all the systems were competitively priced, most lacked the flexibility to work within the context of Doe & Ingalls' manual system and required new procedures and forms, Liebman noted.

So the Wang system got the nod when Liebman learned it could be programmed to identically match Doe & Ingalls' manual records and systems. "The other computer manufacturers wanted us to change our forms, the way we did things, the way we obtained our reports," Liebman said. "With Wang, we didn't have to change anything when we computerized."

Last January, Liebman installed a Wang minicomputer system with customized version of the manufacturer's General Business System (GBS) software package, acquired through Data Processing Services, Inc. Doe & Ingalls' package not only controls inventory, it also prints orders and shipping documents, writes invoices and prepares management reports.

When an order is received, data is taken over the phone and logged onto a standard form. Order entry data includes customer number, product number, discount code and quantity.

Keying the product number into the machine summons a CRT dislay depicting case price and cost, unit selling price and unit cost, chemical nomenclature and package type and size. With such information, the system prints an order with appropriate prices on a four-part carbon form. Shipping and picking papers are generated as part of the same package.

Doe & Ingalls' system consists of a 32K-byte Model 2200 CPU, a 10M-byte disk unit, 240 line/min printer and one CRT terminal.

During most of a typical working day, the machine is available for taking orders as they are phoned in. Between order entries, operators do a number of other functions such as posting cash, inventory control or receivables accounting.

The opening and closing periods of each business day are devoted to DP tasks like the production of daily invoices. The invoicing that used to occupy one staff member full time is now completed in 80 minutes, Liebman noted. During these periods, the system also writes invoices, generates back orders, completes the invoice register, updates sales analyses and generates a commission report.

At month's end, the system prepares a sales report listing customer-by-customer profit margins and supplying sales activity for the month- and year-to-date, he said.

With the modified GBS software, Liebman can display the last 21 transactions for any given product — a feature from which an average demand can be computed for purchasing and stock forecasting.

Data for Clients

The system also selectively prints quarterly sales activity reports that show customers what they have purchased from Doe & Ingalls.

In addition, it retrieves by product a listing of buyers for any given period. "This is of vital importance when a manufactuer issues a product recall," Liebman pointed out.

While Liebman finds it difficult to assign a dollar value to his mini's performance, he claimed that much of its value lies in "the ease it has created in the office and warehouse, as well as the increased comfort and boost in morale" because the atmosphere is no longer rushed and hectic.

Liebman does not foresee an immediate need to expand the system. "We can do three or four times the business with this machine and not have to change it," he said.

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Synthesizer Based on MPU

Portable Unit Offers Speech to the Mute

By Ann Dooley
CW Staff

E. LANSING, Mich. — Victims of stroke or cerebral palsy and other people unable to speak clearly can now be helped to talk — some for the first time in their lives — through a portable, microcomputer-controlled voice synthesizer system.

The unit, which is reported to be the first of its kind, can be attached to a wheelchair so its user does not have to remain stationary or near a DP center or computer room. "That is the beauty of using a microcomputer system — it allows the user to move around at will," John B. Eulenberg, professor of computer sciences and linguistics at Michigan State University (MSU), pointed out.

Eulenberg, who is co-director of the MSU Artificial Intelligence Laboratory, designed the portable system in cooperation with Prof. Morteza Rahimi. The system was developed for James Renuk, an MSU student who has cerebal palsy and cannot command his vocal tract to produce speech.

Although the system is being tested only by Renuk at the present time, a plan is being formulated to use the system to help similarly handicapped pupils in a number of Michigan schools.

The "talking computer" is actually a Handivoice portable speech synthesizer from Federal Screw Works. Controlled by a Motorola Corp. 6800 microprocessor, the Handivoice incorporates Federal Screw's Votrax audio response system.

The system allows the user to access an indefinite number of pages of information through a 17-key keyboard. A modified Heath Corp. Heathkit TC3400 microcomputer incorporated in the system interfaces with specially designed read-only memory (ROM) and uses the 6800 language.

The system utilizes 16K of erasable programmable read-only memory (Eprom) with a Model 2716 Intel Corp. chip. The synthesizer uses 8K of ROM and the system itself rises 16K of ROM to operate.

(Continued on Page 72)

Jim Renuk, a Michigan State University senior in food science from Westland, Mich., uses his portable voice synthesizer system in a conversation with John B. Eulenberg, professor of computer science and linguistics. Renuk has cerebral palsy and cannot speak.

Digitenn's Options Now Standard

UNION, N.J. — Tenney Engineering, Inc. has made several previously optional performance features into standard features on its Digitenn microprocessor programmer.

The changes include 51 program segments that permit a lengthy, nonrepetitive program cycle with programming up to 51 steps, seven event switches offering time-related switch closures, a battery backup system and compatibility with teletypewriter tape or other Ascii input.

Digitenn now also offers a standard power-on program-erase switch that permits total shutdown and optional compatibility with an IEEE bus.

The cost of the Digitenn has not been increased with the addition of these features. A single-channel Digitenn costs $1,575 and a dual-channel version costs $1,875.

Digitenn is a digital display, push-button microprocessor programmer that automatically signals environmental test chamber controls to perform time-related temperature, humidity and altitude programs as a one-parameter test or to perform any two parameters simultaneously.

Tenney Engineering is at 1090C Springfield Road, Union, N.J. 07083.

Controller Links Disk, S-100 Bus

PHOENIX — The SMC 100 controller now available from Konan Corp. interfaces storage module technology disk drives to microcomputer systems based on the S100 bus.

Using the SMC-100, 64K bytes of data can be transferred in less than 350 msec because of a direct memory access scheme used on the controller, the firm said. Data is transferred in blocks using two machine cycles per byte.

Each sector is fully buffered on the controller to eliminate disk and CPU timing restraints, according to the firm.

The controller uses I/O commands for all functions. A driver and IPL read-only memory (ROM) is available which, when accessed with descriptors, performs the indicated disk operations along with automatic error recovery and multiple sector transfers.

Data Integrity

Data integrity is assured by automatic cyclic redundancy check (CRC) generation and checking. The SMC-100 can be used with or without formatting; if the on-board ROM driver is used, the format generation and checking is transparent to the user.

Each controller can accommodate up to four drives providing 14M to 1.2G bytes of storage. The SMC-100 costs $1,650 from Konan at 1434 N. 27th Ave., Phoenix, Ariz. 85009.

Eight Colors Available

DOTHAN Ala. — Intercolor Corp. is offering the 8070 Series I business system, which incorporates a 19-in. CRT screen with eight background colors and a separate keyboard with 192 codes with an 8080A MPU featuring 15K bytes of read-only memory and 16K bytes of random-access memory.

The system has keyboard-selectable transmission rates of 110- to 9,600 bit/sec, a 48-line screen format with 80 char./line, one RS-232C serial port, bidirectional impact matrix printer and dual 8-in. floppy disk drive with 591K bytes.

The system runs under Microsoft Business Basic, and a payroll program can handle up to 500 employees, the firm said.

The 8070 costs $7,000 from Intercolor Corp., Suite 4, 115 North Bell, Dothan, Ala. 36303.

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8002 Users Offered Fortran-80

ALBUQUERQUE, N.M. — Tektronix, Inc. 8002 users can now take advantage of Fortan-80 from Microsoft, Inc., which now operates under the Tektronix Disk Operating System (Tekdos).

The Fortran-80 package allows development and debugging of programs written in Fortran on the 8002 microprocessor development system. The compiler can be used to develop 8080A systems that employ the Intel Corp. 8080A, 8085A and Zilog, Inc. Z80 chips.

The Fortran-80 compiler is accompanied by an assembly language development package that includes a relocating assembler and linking loader. Object code is generated in binary relocatable modules which can be linked to separately compiled Fortran or assembly modules.

The Fortran-80 compiler for the Tektronix 8002 costs $500 from Microsoft, Suite 819, 300 San Mateo N.E., Albuquerque, N.M. 87108.

OSI Users Get Group

NEWTON, Mass. — Owners and all those interested in Ohio Scientific, Inc. (OSI) microcomputers can share information, applications and software through an independent group formed by the Newton Software Exchange.

Many owners experience the same problems and make the same mistakes, and this group hopes to help users avoid many of those difficulties, according to Jack C. Star, president of Newton Software.

Annual dues are $5, which includes a monthly newsletter from P.O. Box 518, Newton, Mass. 02158.

Utility Supports TRS-80

FULLERTON, Calif. — Faulk & Associates Software is offering a utility called SEQDMP that will reportedly read and dump any track and sector on the TRS-80 minidisk.

The program will dump both hexadecimal and Ascii using 16 bytes across, grouped into 4-byte increments. The program can be used to dump the directory, files or random tracks and sectors and will bypass any password protection that may be placed on a given file, the firm said.

The program requires 2K of memory and will run on a machine with at least 16K.

SEQDMP can provide hard copy if a printer is attached and it is ready when the program starts to format a sector. It uses its own disk access code, so it is independent of disk operating system releases.

SEQDMP costs $15.95 (with a 6% sales tax for California residents) from Faulk & Associates Software, 2531 E. Commonwealth, Fullerton, Calif. 92631.

Talking System Built

(Continued from Page 71)

The unit is programmed with three modes of speech: whole phrases; individual words; and sounds, or phonemes. This phrase book of language is placed on a ROM and includes nearly 1,000 stored words, phrases and sounds.

Symbols Translated

The Heathkit microcomputer is programmed to access sequences of these words and transmit them to the voice synthesizer so Renuk can communicate.

According to Eulenberg, the system has the ability to construct long and involved sentences and words. If a word is not included in the stored dictionary of words, the system can construct the word by putting the correct sounds together.

To use the system, Renuk punches a symbol on the keyboard into the microcomputer, which is programmed to decipher the code. The system then translates the symbol into matching audible sounds using the Handivoice.

The system works very well, according to Eulenberg. Research is now concentrating on speeding up the rate of speech.

The automated processing of the sounds takes only seconds, but the rate of speech is dependent on how fast the user can construct the words going into the buffer so they can be sent out in vocal speech patterns, he explained.

In order to speed up the speech process, the physical interface — in this case the keyboard — must be modified so it will be easier to operate. Artificial intelligence research will ideally progress so a system can anticipate what the user is about to do and "navigate in language space," Eulenberg said.

Although the speech is slow and sounds "unhuman," it does give people who never before had an opportunity to communicate a way to speak, Eulenberg said. Most people with speech problems attempt to communicate in writing and unless the recipient has knowledge of the problem, communication is difficult.

Most of the developmental research was performed on a Control Data Corp. 6500 system. Many of the programs were written by a member of the MSU research staff who is also handicapped. Much of the work was done by Jerome Jackson, a blind programmer and Renuk, the student who is unable to talk. The whole thing worked beautifully, Eulenberg said.

Renuk recently demonstrated the system at a U.S. Governmental Interagency Conference in Washington, D.C. This marked the first time such a communication system was used to deliver an extended speech and it went over very well, Eulenberg said.

Before converting to the Motorola system, the MSU lab used an Electronics Products Associates, Inc. 68 microcomputer with a Votrax VS-6 voice synthesizer that had to be plugged into the computer room wall, limiting movement.

Bored with Board

When Renuk was outside the room, he carried a language board consisting of about 100 words and phrases to which he would point in order to be understood. This was extremely cumbersome, however, and taxed both Renuk and the person with whom he was attempting to communicate, Eulenberg said. It took about a year and a half before the portable system was developed.

Although few research centers around the country are currently engaged in this kind of research, it is a growing field, Eulenberg said.

One line of research seeks to find ways of using electric signals to determine muscle activity and then using a microcomputer for pattern recognition and reconfiguration by recognizing different muscle signals. The user would only have to think about moving a muscle to activate the muscle neutrons and thought processes, which the system could pick up and convert, he said.

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Judge Won't Dismiss Charges

CFI Suit Against Decimus Still Stands

By Marcia Blumenthal
CW Staff

NEW YORK — A federal judge here has refused to dismiss claims brought by Computer Finders, Inc. (CFI) last April against Decimus Corp., a subsidiary of Bankamerica Corp., and two of its senior executives.

At the heart of the suit are CFI claims that John Margoes, Decimus president, and John M. Mickel, executive vice-president, deliberately started an investigation into vague allegations of bribery on CFI's part and used those allegations as an excuse to cease paying monthly contract fees to CFI.

The suit charges Margoes with starting the investigation because he felt that CFI was too small a company to be collecting the amount of fees agreed upon in written contracts between the two companies.

Since the action's filing, Mickel has become a senior vice-president of the Bank of America, according to court documents.

CFI is a small leasing company whose specialty is arranging the leasing and subleasing of computers. Decimus is also in the leasing business and its various leasing programs involve computers worth more than half a billion dollars, the suit stated.

Between 1974 and 1976, according to the complaint, CFI arranged a computer leasing program in which General Electric Credit Corp. (Gecc) agreed to purchase up to $200 million worth of new IBM computers which were to be leased to Decimus, then subleased by Decimus to other companies. Gecc also agreed to pay Decimus a monthly "sublease administration fee" for each sublease Decimus arranged.

In January 1976, the suit continued, Decimus and CFI entered into a written contract under which Decimus agreed to pay CFI an origination fee and an ongoing fee for each lease negotiated. CFI had certain rights to participate in the remarketing of the computers once the leases expired, according to one of the suit's claims.

Fee Payments Stopped

A total of 17 computer subleases were executed under the Gecc program with Decimus as sublessor and various other companies as sublessees. Decimus paid CFI the fees agreed upon in their written contract until about August 1977.

Last April, when the complaint against Decimus was filed, Decimus had not paid CFI since August 1977. As of Nov. 1, the fees due CFI from Decimus exceeded $750,000, the suit contended.

Just prior to the cessation of payments to CFI, according to the CFI filing, Decimus informed CFI it was conducting an investigation to find out whether "improper payments" had been made by CFI to certain Decimus employees in connection with the negotiation of the Gecc program. The investigation was prompted by a Decimus employee's statement that key Deci-

(Continued on Page 84)

Revenue Act Expected to Bring Capital to Technology Firms

PALO ALTO, Calif. — The recent signing of the Revenue Act, which reduced the maximum capital gains tax from 49% to 28%, is expected to result in an infusion of capital for high-technology firms, according to members of the American Electronics Association's (AEA) capital formation task force.

However, the reduced capital gains taxes will cause an estimated $2 billion shortfall in net capital gains tax revenue, according to estimates of the U.S. Congress' Joint Committee on Taxation.

The government's figures are based upon the consensus that about $3.8 billion in reduced tax revenue from tax cuts would be offset by about $1.8 billion in additional tax revenue gained from new capital formation.

However, the AEA thinks the revenue loss will not be as high as government figures indicate. According to an AEA-commissioned study made by Chase Econometrics, tax revenue gains and losses would just about even out with the maximum capital gains tax rate at 25%.

In commenting on the Revenue Act, Dr. Edwin V.W. Zschau, chairman of Systems Industries, Inc. and head of the AEA capital formation task force, said AEA is encouraged by the government's growing recognition of the necessity of stimulating risk capital investment.

"Until this year, Congress did not understand the connection between risk capital investment and job creation," Reid W. Dennis, a venture capitalist and AEA task force member, noted.

Dennis also pointed out that AEA's testimony at congressional committee meetings concentrated on showing members of Congress that young, high-technology companies generate jobs at a much faster rate than more mature companies.

AEA's survey showed that it takes

(Continued on Page 84)

Technology Transfer Service

Technotec Sale to Soviets OK'd

By Marcy Rosenberg
CW Staff

MINNEAPOLIS — Control Data Corp. recently received U.S. government approval to make available its computer-based technology transfer service, Technotec, to the USSR, Eastern Europe and Yugoslavia.

Under a license agreement with the U.S. Department of Commerce, CDC will provide the Technotec data service from a CDC Cyber 172 computer located in Brussels, according to Robert D. Schmidt, executive vice-president. The computer will not be connected to any other system, ensuring that users access only Technotec data and no other information.

The U.S. Commerce Department stipulated that users not be able to interface directly with the computer, that it receive reports of each transaction within 60 days and that no data be contained in the data base that would require a validated U.S. license for transfer.

Users will be able to request information through a terminal connected over telephone lines to CDC's Brussels center, where a CDC western representative will screen the request, query the computer and transmit the information to the user terminal,

(Continued on Page 80)

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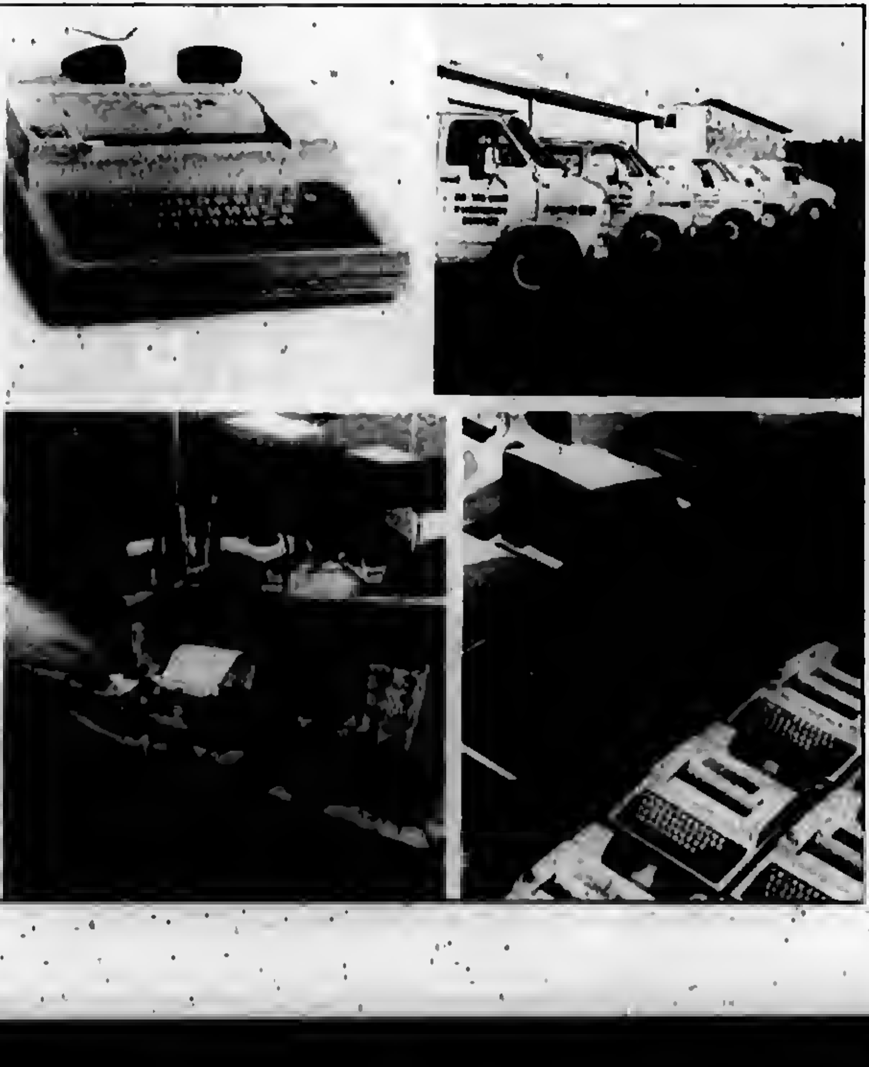

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U.S., IBM Trying 'Narratives' to Speed Trial

By Connie Winkler
CW Staff

NEW YORK — The U.S. vs. IBM antitrust trial is speeding up at the same time it is grinding to a halt. That paradox has developed because both IBM and the Justice Department are trying a new technique, narrative statements, for the introduction of direct testimony from IBM's witnesses.

In order for the statements to be prepared, the court will go to a three-day, Tuesday-through-Thursday calendar for the next month.

IBM lead attorney Thomas D. Barr estimated the written narratives could save 150 to 250 trial days, but he asked for a 30-day hiatus to get the procedure organized. Judge David N. Edelstein rejected the hiatus but agreed to the three-day week.

Edelstein is optimistic about the narrative technique, which has been tried successfully with two witnesses, IBM controller C. Arthur Northrop and Dr. H. Dean Brown of Zilog, Inc., whose testimony has just been completed.

The judge also agreed to another experiment in which the narrative would be presented in lieu of the deposition, when witnesses are questioned about the nature of their testimony. The first witness with which this will be tried is Jane Cahill Pfeiffer, who was to be deposed in early December. Pfeiffer, a successful IBM executive and former IBM corporate director of communications, was recently named chairman of the board of RCA.

Lead government attorney Robert S. Staal objected vigorously that the depositions not be discontinued entirely. And he refused to give up the government's prerogative to subpoena documents after the introduction of the narrative statement.

In the robing room chambers where this was discussed, Staal also suggested that the narratives were just a tactic by Barr to delay the trial. Barr vigorously objected that it is important to his client to finish the case as soon as possible.

Barr was much more enthusiastic about the use of the narratives and characterized them as the first real opportunity to expedite procedures.

Whereas IBM direct testimony could have taken a week or longer, with controller Northrop it took less than five minutes. Northrop's direct testimony consisted of the introduction of 18 written pages and 11 exhibits. With Brown, who has extensive experience in the computer industry dating back to the Atomic Energy Commission, the direct testimony took 27 pages supplemented by a half-day of live testimony, which was requested by government counsel.

Barr's only problem with the narratives was that he did not have the staff to take them and write them while at the same time attending depositions, producing documents and carrying on the case in court.

However, despite the rhetoric about expediting matters, the fact remains that IBM has more than 50 witnesses yet to call, although that number has been reduced from about 150.

It took the government three years to present 54 witnesses. IBM, despite an August recess, has already called 10 witnesses.

Supershorts

Memorex Corp. has signed a license agreement with Enertec, Paris-based manufacturer of instrumentation magnetic recorders, giving Memorex the right to manufacture and market data cartridges worldwide using Enertec patents. The agreement also grants Memorex exclusive rights for one year to produce 1/4-in. cartridges.

— — —

Computer Devices, Inc. has set up a marketing operation in Paris to distribute its Miniterm line of portable and desktop terminals and computers in Europe and the UK.

— — —

Network Systems Corp. has signed Tesdata Systems Corp. as exclusive distributor and service organization in Europe and the Middle East for Network Systems' Hyperchannel computer interconnect networks.

— — —

IBM has declared a regular quarterly cash dividend of $2.88 per common share, payable Dec. 9 to holders of record Nov. 8.

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Computer Micrographics, Inc. plans to spend nearly $1 million for new equipment at its nationwide service centers, bringing the firm's total capital investment over the next two years to more than $2 million.

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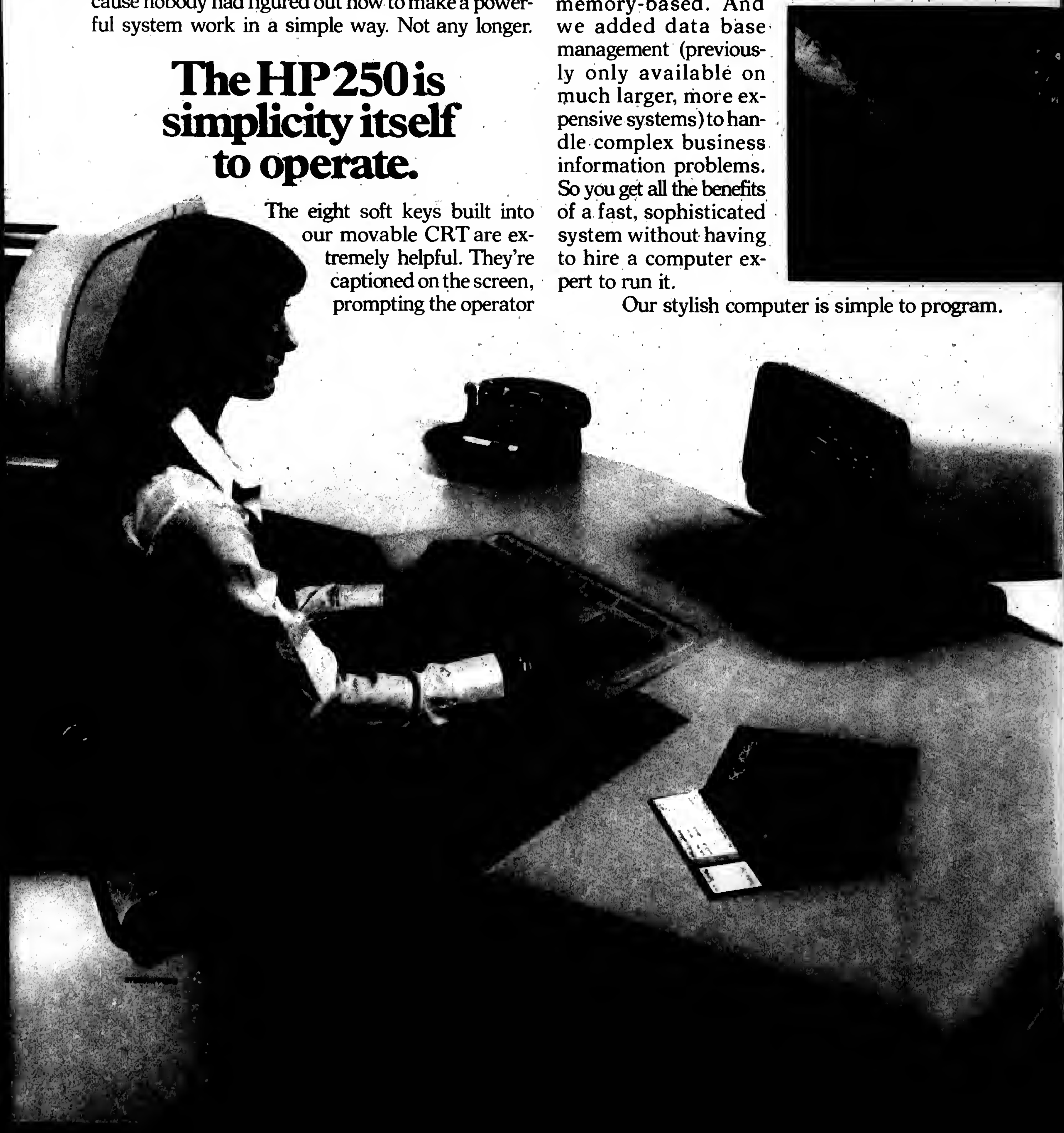

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Japan's General-Use CPUs Seen Tripling by '85

GENERAL-PURPOSE COMPUTER SYSTEMS IN USE IN JAPAN AS OF DECEMBER 31, 1976

(Figures Supplied by Miti)

Unit Size	Domestic Products	Foreign Products	Total	Percent Of Grand Total
Large	755	391	2,179	5.6%
$830,000-$1.67 Million				
$1.87 Million and Up	492	541		
Medium				
$130,000-$330,000	2,894	865	6,082	15.8%
$330,000-$830,000	1,723	600		
Small				
$33,000-$130,000	8,235	2,788	11,023	28.3%
Very Small				
Up to $33,000	10,985	8,658	19,643	50.5%
Grand Totals	25,084	13,843	38,927	100%

TOKYO — At the end of 1976, there were 38,927 general-purpose computers installed in Japan, according to statistics compiled by the Ministry of International Trade and Industry (Miti) here.

And Miti estimated by 1985 the number of installations will increase nearly threefold, climbing to 107,000 units, representing about a 12% annual growth rate in the use of general-purpose computers in Japan.

In addition to these general-purpose systems, Miti reported 11,094 minicomputers in use, and the Japan Electronic Industry Development Association noted that 8,000 process control computers were in service.

Yoshio Honda, general manager of Fujitsu Ltd.'s California office, estimated the installed base in Japan at the end of 1976 to be worth about $12.5 billion.

According to breakdowns supplied by Miti (see chart), foreign-made computers account for about 36% of the installed base, with the dollar value of foreign-made units amounting to 43.2% of the total worth of general-purpose computers.

From 1975 to 1976, the monetary value of general-purpose systems installed grew by 15.5%. But Miti noted that the value of Japanese-made units grew by 18.3% while the value of foreign-made units grew by only 10.6%.

Miti's figures show that foreign-made units are utilized more frequently in the large-scale and very small-scale categories.

Five industries accounted for 63% of general-purpose computer usage. Following are the unit breakdowns for the five largest industry users: the wholesale, agency, brokerage and retail sectors accounted for 12,736 units; the financial sector, 4,371 units; the service sector, 2,851 units; cooperative and other associations, 2,149 units; and the electrical machinery sector, 1,925 units.

The financial industry is the top spender for general-purpose computer equipment, Miti reported, with total installations valued at about $2.4 billion. The wholesale, brokerage, agency and retail industries follow with total equipment valued at about $1.4 billion.

Aside from the compounded annual growth of about 12% forecast for general-purpose computers, Miti predicted that on-line terminal equipment growth will top 23% annually until 1985.

Although compiled annually, the 1976 statistics are the latest figures available from Miti.

PCC Planning to Acquire Part of Philip's Assets

LOS ANGELES — Pertec Computer Corp. (PCC) and North American Philips Corp. have signed a letter of intent whereby PCC would acquire certain assets of Philips' small business computer operations in the U.S.

Part of the letter of intent stipulates that PCC would provide service and software support in the U.S. for the small business computers sold by the Data Systems Division of Philips Business Systems, Inc.

Under the proposed seven-year agreement, Philips would transfer to PCC the maintenance obligations for the installed base of systems sold by the Data Systems Division as well as associated software and spare parts for maintenance purposes.

Furthermore, PCC would obtain nonexclusive rights to all existing and future software developments for these systems.

Although neither company would comment on the agreement or specify which particular assets of Philips are involved, a definitive agreement is expected by mid-December.

Contracts

The following contracts have been awarded to Canada Systems Group: The financial Management Branch of the Ontario Ministry of education has signed a 12-month agreement valued at approximately $10,000. The Regional Municipality of Ottawa-Carleton has signed a one-year contract that will cover about $10,000 worth of processing; and Douglas Aircraft Co. of Canada Ltd. has signed a 12-month agreement for approximately $10,000 using Canada Systems' Computer Output Microfilm services.

Anacomp, Inc. has signed a contract with the National Bank of Kuwait to modify and install its Customer Integrated Reference File for the bank and its 35 branches.

Integrated Software Systems Corp. has been awarded a contract from the National Research Council, Ottawa, Ontario, Canada. Under the terms of the contract, the council has licensed Integrated Software's Disspla computer graphics software system.

Tally Corp. has an OEM agreement with Four-Phase Systems, Inc. for the purchase of its Tally printers over a three-year period.

Pertec Computer Corp. has been awarded a $1.3 million two-year contract by General Computer Systems for tape and disk drives.

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VT100 CRT DECscope	1,595	153	81	56
TI 745 Portable	1,875	175	94	65
TI 765 Bubble Mem.	2,995	285	152	99
TI 810 RO Printer	1,895	181	97	66
TI 820 KSR Terminal	2,395	229	122	84
QUME, Ltr. Qual. KSR	3,195	306	163	112
QUME, Ltr. Qual. RO	2,795	268	143	98
ADM 3A CRT	875	84	45	30
HAZELTINE 1400 CRT	845	81	43	30
HAZELTINE 1500 CRT	1,195	115	67	42
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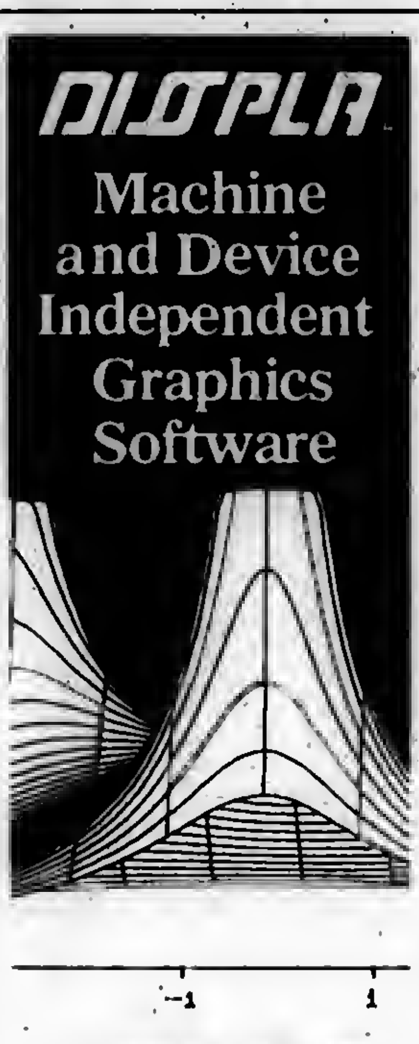

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CDC Fifth DP Firm With Moscow Office

WASHINGTON, D.C. — Control Data Corp. recently became the fifth computer company to officially establish an office in Moscow. The primary purpose for opening a Moscow office is to "sell equipment and acquire Soviet technology," according to a CDC spokesman based here.

CDC received the required accreditation from the USSR State Committee for Science and Technology on Oct. 31. The accreditation process took about two years. CDC is the 24th U.S. company to be granted accreditation.

The Soviet operation is headed by James Totman, a former official at the U.S. Embassy in Moscow.

Recursive processing is one Soviet technology CDC is exploring in great detail, according to Robert Schmidt, executive vice-president of CDC.

These systems are used primarily for process control; they consist of a series of computers hooked together in a random fashion. This allows any portion of the equipment to work on a program without particular ordering sequence, he explained.

An official statement released by the Soviet Embassy here noted that the foundation was laid for cooperation between CDC and the USSR five years ago. At that time, CDC and the USSR Committee for Science and Technology signed a long-term agreement which included setting up a joint coordinating group to study specific computer designs.

Prof. Vladimir Myasnikov, a member of the USSR Committee for Science and Technology, said U.S. companies are interested in the vast potential of the Soviet marketplace as well as Soviet technology.

CDC purchases equipment from the USSR. According to Myasnikov, "the company purchased a computer system based on the GDR-made EC-10-40 with Soviet peripherals and is now negotiating the purchase of applied program packages."

IBM, Hewlett-Packard Co., Honeywell, Inc. and Sperry Rand Corp. are the other computer companies with offices in Moscow.

CDC Gets Approval to Sell Technotec Service to USSR

(Continued from Page 73)

Schmidt explained.

The data base does not contain the technology itself, but rather lists brief abstracts of what the technology can do, Schmidt said, so interested persons can contact the seller to complete a final transaction.

"By making our Technotec data base more readily available to the Soviets, we expect to contribute to a favorable balance of trade through the sale of commercial technology," he said.

In return, CDC hopes to gain more Soviet technology briefs to "offer U.S. industry the opportunity to evaluate new and improved processes in many areas." Technotec already contains some 200 Soviet entries, he noted.

Calling the service "a huge international set of yellow pages," Bill Moody, recently named Technotec president, said CDC maintains the technology abstract listing on its worldwide Cybernet data service.

CDC started Technotec about three years ago. While each partner in any technology exchange is free to pursue the market in its own way, the industry first expressed some concern over competitive disadvantages that could result from duplicating products.

Asked how receptive industry has been to the service in light of this concern, Moody pointed out that the Technotec data base has grown to include more than 18,000 entries and called the market potential "tremendous."

"Technology transfer is actively pursued in almost every type of organization through R&D groups, corporate development functions and patent license departments," he said.

Free Listings

To spur technology exchanges in the "critical" areas of solar energy, agriculture and food processing, CDC plans to offer 1,000 free one-year listings to individual inventors who hold patents in these areas. Through this offer, the firm hopes to add about 700 U.S. and 300 international patents to the Technotec Inventor's Registry.

Because searchers who find useful technologies in the Technotec data base usually contact the owner directly, CDC finds it difficult to track specific companies which, through its service, have made exchanges.

"While we know matches have occurred between a potential buyer and seller," Moody added, "the business relationships that may result are and should be private."

He did, however, cite two general examples of technology exchanges made via Technotec. One involved a U.S. mechanical refrigeration firm that supplied a special immersion freezing technique to a Venezuelan fishing fleet company.

Another deal is in the works between Soviet and West German firms for information on integrated circuit manufacturing techniques.

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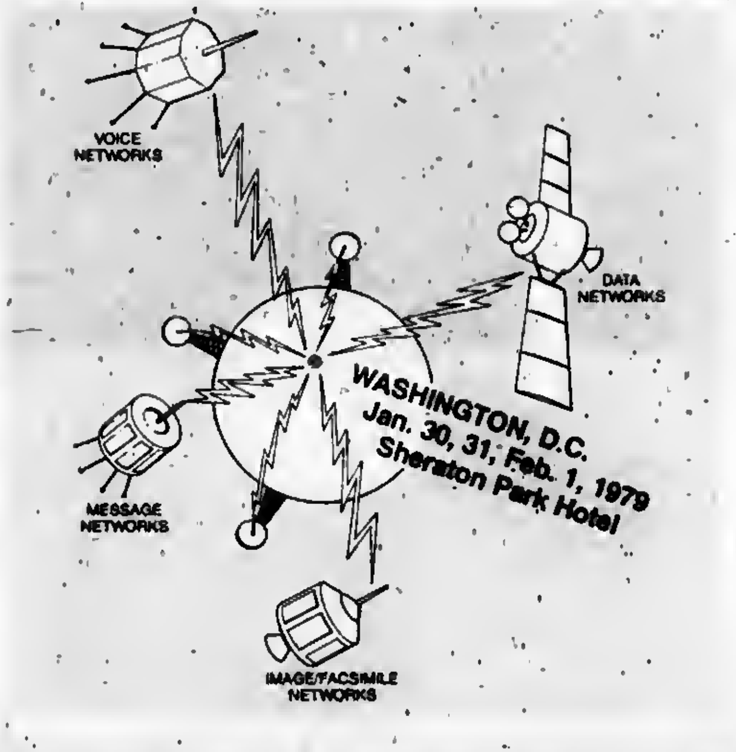

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Lessor Asks: Will Terminal Leasing Firms Last?

BOSTON — "Terminal leasing businesses are springing up almost overnight in every part of the country. The question, though, is whether these companies will be in business two years from now."

Sonny Monosson, president of American Used Computer Corp., asked that question in a recent interview and also noted that terminal leasing is growing even faster than computer terminal sales, which are expected to double by 1982.

Terminal lessors are today experiencing pressure from two fronts, according to Monosson. On one side, users are clamoring for short-term leases — ideally 90-day leases. On the other side, however, commercial lending institutions are reluctant to lend money to lessors for purchases of terminals unless they obtain one-year leases from their customers.

"With money so tight right now, there is a problem, and probably not many firms will be able to offer short-term leases," Monosson reasoned. Consequently, customers will be putting pressure on manufacturers to offer short-term leasing programs.

A major force behind the demand for terminals has been the rapid development of distributed processing and telecommunications systems within the last five years, he said.

Competition Among Vendors

Terminals are being announced at the rate of almost one per week by both major manufacturers and relative unknowns, Monosson noted. These manufacturers, however, favor large-volume sales to OEMs and distributors to avoid the financial headaches of customer support.

This competition among vendors has flooded the marketplace with "special-purpose" terminals which are technological masterpieces but often exceed user requirements and are very costly. Misinformation about terminals and a preference for leasing has resulted when vendors try to unload these terminals on a large scale, he said.

Leases give a user the chance to evaluate terminals on location and to determine the company's actual needs without having to make a commitment. Users are also reluctant to buy because they wish to avoid tying up cash flow on capital assets and are not able to define specific time and need requirements.

Flexibility is what the customer needs and wants, Monosson stressed. "Everyone has the same hardware and can offer rock-bottom rates. The thing that's going to separate the surviors from the nonsurvivors is the ability to offer lease flexibility and customer support."

The problem for many of the smaller lessors and newcomers is that they are not in the position to offer flexible terms. Commercial lending institutions, with a typically cautious approach, are dictating the policies by which these businesses lease hardware, Monosson pointed out. Limiting lease periods to a minimum of one year, requiring user committal to lease purchase plans and setting extensive roll-over penalties were some of the policies Monosson cited.

These policies considerably jeopardize marketing capabilities. What is worse, Monosson emphasized, is that when all local or regional competition is bound to these restrictions, the user is placed in the unfavorable position of having to accept lease terms that are contrary to his needs.

Regional distributors have usually held the edge within their own territories because customers prefer to avoid high shipping costs on top of installation fees. But when high shipping costs are weighed against inflexible lease structuring by local competition, concerns about shipping costs disappear, he pointed out.

"Companies capable of offering short-term leases, monthly roll-over periods and purchase options will become increasingly effective in penetrating regional and local markets," Monosson predicted. "American Terminal Leasing Co., for instance, has been highly successful in nationwide leasing of Decwriter IIs and IIIs because of its month-to-month leases.

"Customer support is the other key area where businesses must outperform their competition," Monosson maintained. "This is basically a function of experience. When you've been in business for a long time, you've had the chance to make a lot of mistakes."

Steps for Success

Having the hardware on hand is the first step. "Smaller businesses and newcomers may initially have the terminals," Monosson noted, "but what happens when they've just leased their whole inventory for a year and they get a call for five CRTs tomorrow?" A positive aspect of the short-term lease is the constant inventory turnaround and availability.

Equally important is the physical space to stock inventory.

Providing quick delivery and pickup is the second step. "A terminal lessor must develop a fine-tuned rapport with the trucking industry," Monosson said.

Making sure the terminal is properly installed and running is the final step. Constant telephone contact with the field service organization — usually provided by the manufacturer — is necessary. "A thorough knowledge of terminals and hands-on experience is absolutely necessary for the terminal lessor," Monosson noted.

Survival Pressure

It is important to treat the customer with courtesy. "There's a lot more to it than just signing the contract. When it comes to customer support your first impression is a lasting one . . . you'd better make sure it's a good one," Monosson emphasized.

The pressure to survive is already being felt in the terminal leasing industry. According to Monosson, those with inadequate remarketing ability and limited capital will probably go the way of the IBM 360 lessors; very few of the original leasing firms have survived.

In time, all survivors in the terminal leasing industry will offer basically the same terminals, rates and lease flexibility, he believes. Then banks will be more likely to loosen the harness on lease policy with the surviving lessors, so that the only difference between them will be in customer service.

Monosson left potential terminal users to ponder two possible threats to the industry: "There are two major questions that may confuse the entire market. Will the Japanese invade the market, as they have the television market, and more important, will every telephone eventually become a terminal? These two real threats to a stable market should encourage the short-term lease."

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Judge Allows CFI Lawsuit Against Decimus

(Continued from Page 73)

mus employees in New York and San Francisco had received bribes and kickbacks.

CFI immediately countered; the suit explained, stating that the allegations of bribery were false. In October 1977, under oath, in written affadavits drafted by Decimus, CFI agreed to supply certain information to Decimus; Decimus, in turn, agreed to resume the contractual payments to CFI. However, Decimus reneged on its agreement to resume the payments, the suit alleged.

In its suit, CFI claimed it "has been damaged by Decimus' continued public and disparaging assertions of the false claim that improper payments may have been made by CFI."

CFI contended that Margoes intended to compel CFI to accept drastically reduced payments. Furthermore, it also accused Margoes of expressing the view that banks (meaning Decimus, a subsidiary of Bank of America) should make a lot of money and that CFI should not make so much money. This viewpoint, CFI said, was one of the factors causing Margoes to start the bribery investigation against CFI.

Dismissal Asked

Rather than respond to any of the charges, Decimus filed a motion in June to dismiss several of CFI's charges. A motion to dismiss the charges against Margoes and Mickel was made on the grounds that the court lacked personal jurisdiction over those defendants in their individual capacities, particularly since they did not reside in New York during the time the alleged activities took place, but rather traveled to New York infrequently and for short durations.

The defendants asked the court to dismiss other complaints on the grounds that in New York a breach of contract does not constitute an actionable tort and that punitive and exemplary damages are not recoverable on a claim for breach of contract.

The ruling made by Judge Richard Owen, however, indicated that those claims made by CFI against Decimus can indeed be heard in New York courts.

Law to Spur Risk Capital

(Continued from Page 73)

more than $30,000 in assets to pay for one additional job in a high-technology firm, and $14,000 of that capital must be obtained through risk capital.

Although the value of stocks of high-technology companies can quadruple in three or four years, the high risk involved with those investments compounded with a maximum capital gains tax rate of 49% caused many investors to avoid those stocks, Kenneth Hagerty, vice-president of government operations for the AEA, pointed out.

Pressure from the AEA task force and grass roots support from executives in AEA's 1,200 member firms, along with backing from Rep. William A. Steiger (R-Wis.) and Sen. Clifford P. Hanson (R-Wyo.), were the forces that overcame President Carter's threat to veto any tax bill containing provisions for cuts in the maximum capital gains tax, according to AEA officials.

Executive Corner

- Harry J. Morley has been elected president of ITT Communications Systems, a division of International Telephone & Telegraph Corp.
- J. Robert Harcharik has been named president of Tymnet, Inc.
- Sherman A. Drusin has been named president of Program Products, Inc. Paul R. Kalback has been promoted to senior vice-president and Emanuel A.Canibra has been promoted to vice-president at the firm.
- Peter S. Jonas has been elected vice-president of finance, treasurer and chief financial officer of General Automation, Inc.
- Charles A. Dickinson has been appointed senior vice-president of operations at Data Products Corp.
- James Graves has been appointed to the position of vice-president of operations at Micom Systems, Inc.
- Paul R. Lachance has been appointed national sales manager for Data I/O Corp.
- Joseph C. Antonaccio has been named director of communications for Analogic Corp., and Ronald F. Morales has been appointed purchasing manager at the firm.
- J.W.E. Hollely has been named product marketing manager for the System Ten product line at ICL, Inc.
- C. Jean Littrell has been promoted to corporate marketing services manager at Stanford Applied Engineering, Inc.
- Charles Çech has been appointed vice-president of sales at Pro-Log Corp.
- Ben Irwin has been promoted to manager of programs at Monolithic Memories, Inc.
- John DeLuca has been appointed director of operations control for the Wyle Distribution Group.

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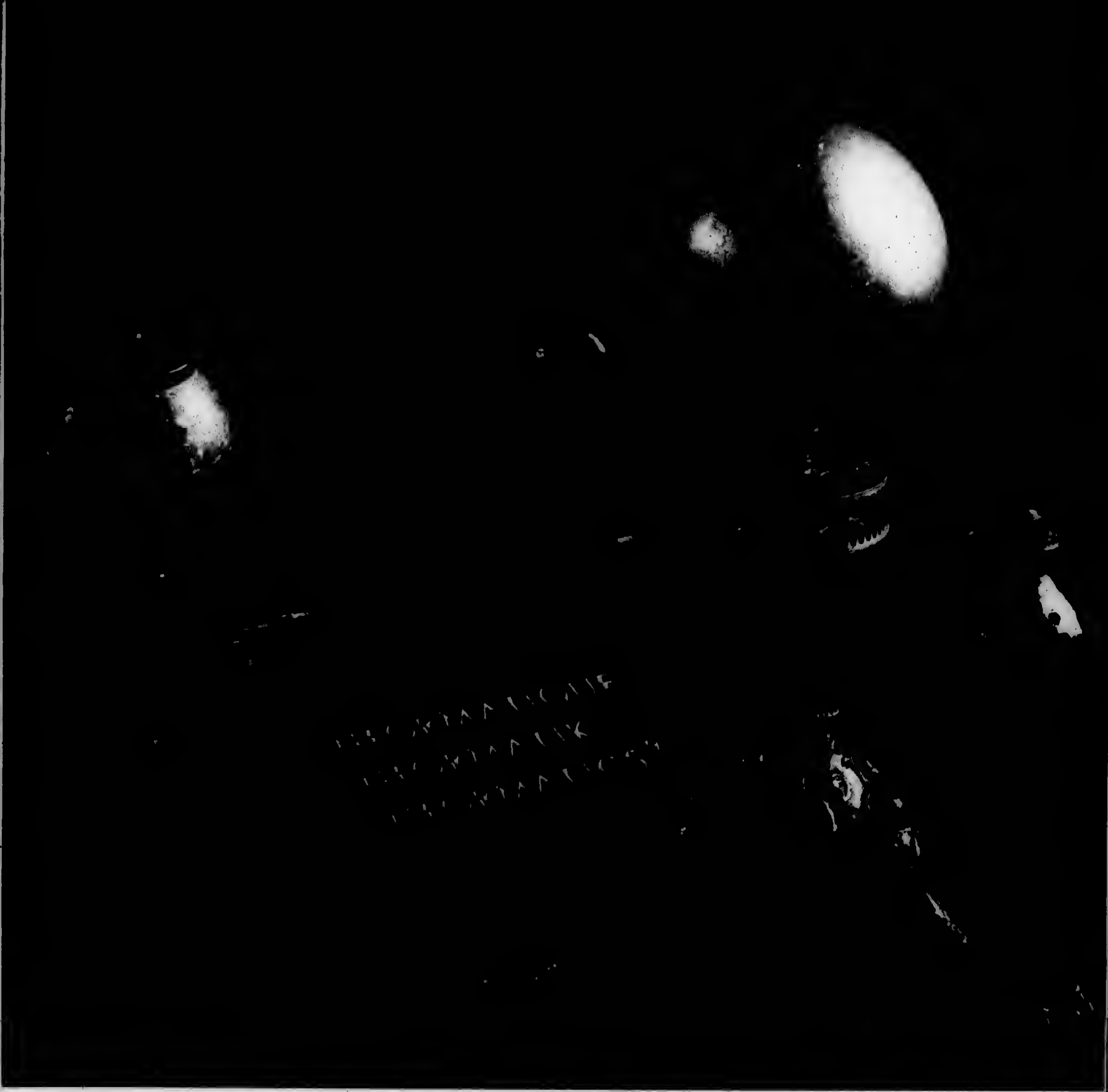

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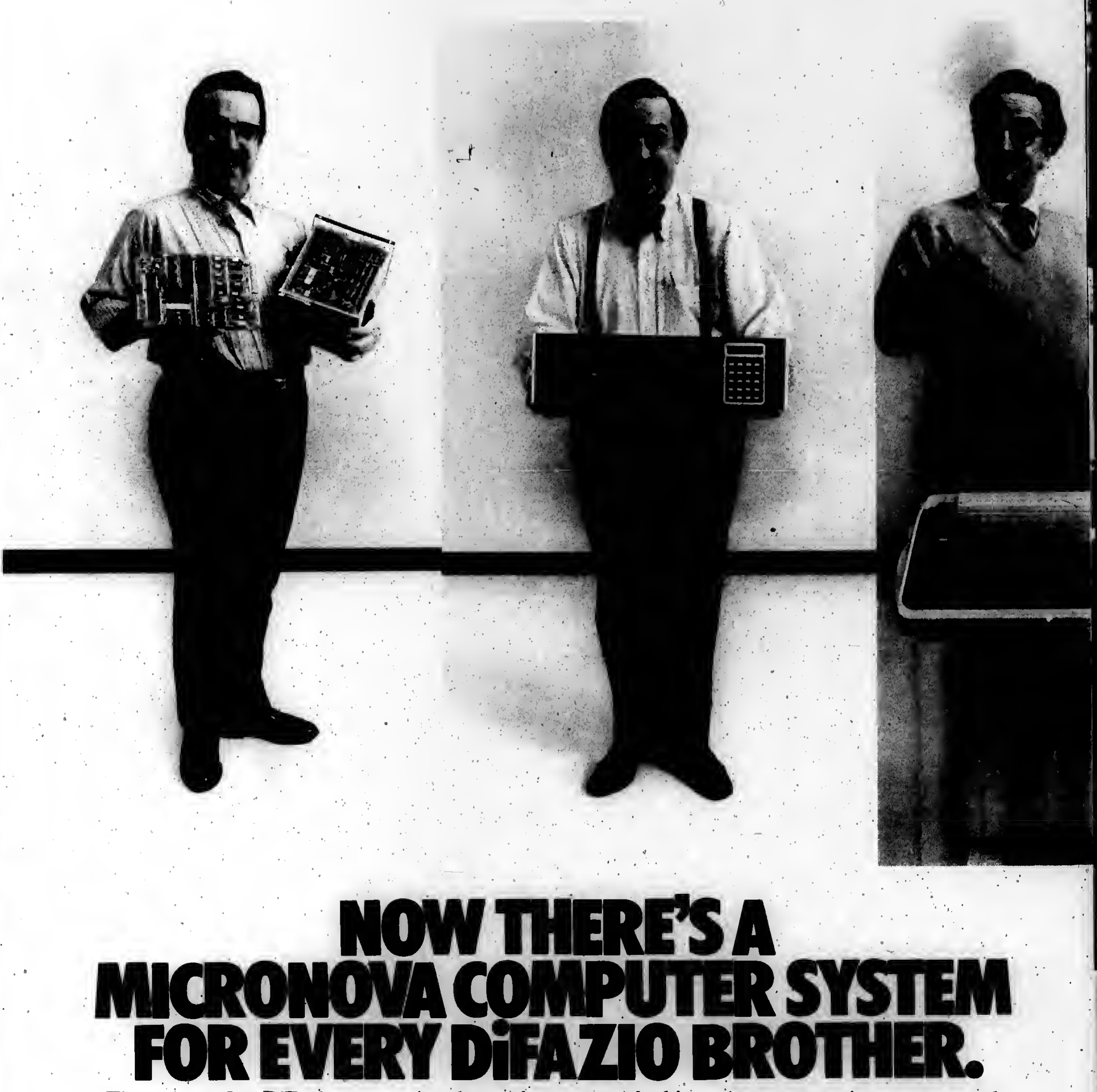

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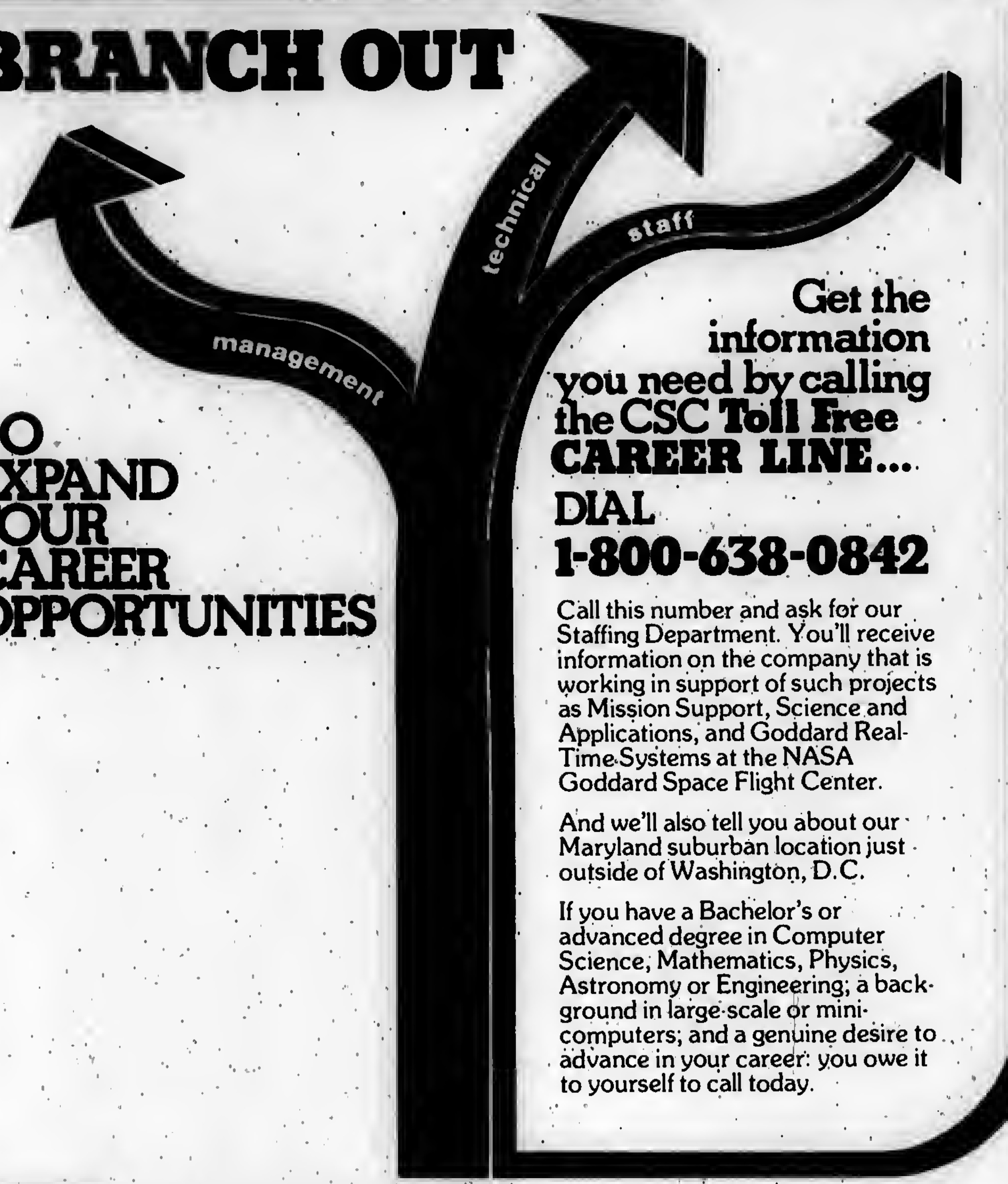

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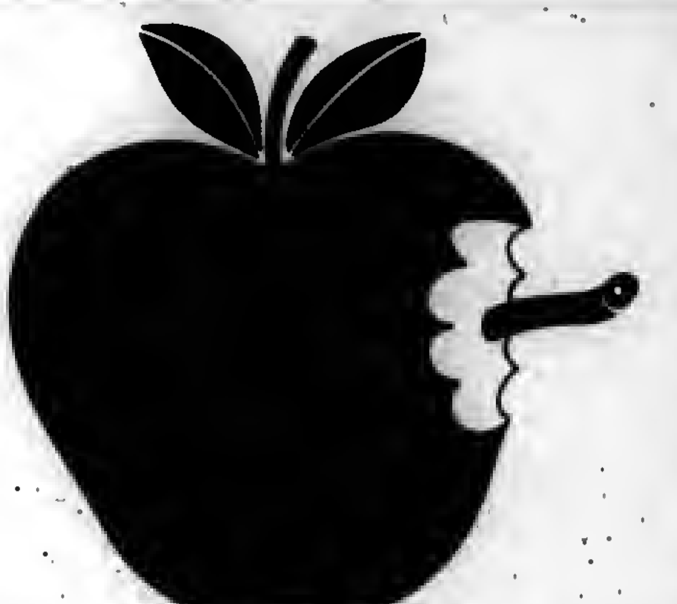

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Systems Personnel
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426 Forbes Avenue
Pittsburgh, Pennsylvania 15219
Telephone (412) 391-8450

SAN FRANCISCO
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San Francisco, California 94111
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Montana State Univ.
Bozeman, MT 59717

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Want to build a major new DBMS? Get into page formats, indexing schemes, and pointer arrays! Find out how to optimize search paths for complex queries. Program and test algorithms for storage and data structure access. Learn why integrity, protection, and data independence are central concerns of our DBMS. If you think you can benefit from working with some of the best DBMS designers in the world and are already a top-notch implementor of systems software, let us hear from you.

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You will be a specialist on a design team and perform key functions in designing the architecture of future data base management systems.

This is a highly visible position in our advanced Software Development Group, providing an opportunity to influence DBMS state of the art. If you have experience in data base security, integrity and recovery, and are familiar with the requirements for data communications and distribution of data as well as a strong interest in designs supporting multiple end user interfaces, this position should be of interest to you.

Systems Analyst/
Product Integration Specialist

Our Advanced Computer Development Group is looking for a top-notch systems analyst with good analytical and communication skills to assist in the complex task of integrating current development activity with defined product goals and existing proven software structures. Working on Wang's new 32-bit Virtual Memory Computer Systems, this position offers an extraordinary opportunity for involvement in many facets of the software development for a major manufacturer's general purpose computing system.

If you really want to be effective in contributing to state-of-the-art computer systems development, this is the place. Necessary qualifications include system programming experience, good communication skills, and a record of professional excellence.

Systems Programmer

Our Advanced Computer Development Group is looking for a top-notch Systems Programmer to assist with major development activities in support of Wang's new 32-bit Virtual Memory Computer Systems. Job responsibilities include analysis, design, implementation, maintenance, and documentation of systems software components such as the operating system, compilers, system utility programs, data base management, and networking management.

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Systems Analysts
Systems Programmers

If you enjoy designing, simplifying, documenting, and explaining complex software systems, come join our Advanced Computer Systems Development Group as a

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We have several positions open for competent computer system professionals with good analytical and communication skills to assist in the challenging job of clarifying and organizing the vast body of software design knowledge developed in support of Wang's new 32-bit Virtual Memory Computer Systems. As System Design Documentation Specialist, you'll develop system overview and program logic manuals, maintain functional reference manuals, and help coordinate the flow of product development information to our technical writing department. As collector, organizer, contributor, and editor of these formal technical communications, you'll help develop the common information base needed to support current and future development. By providing clear, organized information on current software structures, facilities, and conventions, you'll help us educate our fast growing research and development staff.

We're looking for capable individuals familiar with operating systems, compilers, data base management, or telecommunication systems, who enjoy creating lucid models and descriptions of otherwise complex structures. These positions offer excellent visibility and numerous possibilities for advancement within the corporation. Necessary qualifications include systems programming experience, competence in reading IBM 360/370 assembly language programs, good communication skills, and a desire for professional excellence.

We are an affirmative action employer

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We offer excellent salaries and benefits. Please submit your resume including salary history and indicating position or positions of interest to Gary Biongiewicz, Manager Professional Recruiting, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851; or call him at (617) 851-4111.

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If you have 0–10 years in scientific and systems programming, and wish to broaden your experience, consider the opportunities in one of the following areas.

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A requirement is a B.S. degree in Computer Science, Mathematics, Engineering or related fields.

For immediate consideration, call 1-800-243-3342 toll free or send your resume (including salary history) to Professional Recruitment, Office 124, Pratt & Whitney Aircraft Group, East Hartford, Conn. 06108.

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If you are ready to apply your experience in a dynamic, results-oriented environment, write or call Ampex Corporation, Programming Staff, 401 Broadway, MS 2-20, Redwood City, CA 94063. (415) 367-2600. An Equal Opportuntiy Employer M/F.

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Southeastern Massachusetts University has openings for a qualified individual to participate in the design, development, implementation and delivery of administrative information and data processing support systems for the University. Systems utilized in this area will be developed for a DECSYSTEM-20 using data base techniques.

Qualifications: Information Services include a Bachelor's Degree plus at least five years' significant experience in computer systems and programming. The successful candidate will have a demonstrated capacity to function effectively in educational systems:

Salary Range: $14,000 - $23,914

Send resumes to: Gordon VanBrunt, Information Services, Southeastern Massachusetts University, North Dartmouth, Ma 02747

Application deadline: December 15, 1978

For further information, call Gordon VanBrunt, 617-997-9321, ext. 303 or 305.

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Mr. JOE ARNOLD
Manager Information Systems
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Excellent benefits with compensation based on experience. Send confidential resume and salary listing to:

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Minimum requirements are 6 to 8 years of demonstrated leadership in academic, research or high technology industrial setting. Considerable knowledge of current state-of-the-art hardware, software and telecommunications in a college or university (including a College of Medicine) is desirable.

Master's Degree is required; however, a Doctorate in Computer Science, Business Management, Mathematics or a related field is preferred.

Salary consistent with top level University administrative responsibilities.

Please send resume by December 15, 1978 to:

Director of Personnel
East Tennessee State University, P.O. Box 24070A
Johnson City, TN 37601
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Head of Computer Center

Mississippi State University is seeking candidates for the position of Head of the Computer Center. Position responsibilities include management of a large-scale central computer, coordination with user personnel, leadership in systems development and long-range planning, supervision of approximately 35 employees, and the possibility of part-time teaching. Position also includes the possibility of academic appointment.

A large-scale Univac 1100 system provides computer support to teaching, research, service, and administrative data processing.

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Salary open. Send resume by February 1, 1979 to:

Dr. Fred Oevis, Director
Division of Computing Affairs
Mississippi State University
P.O. Drawer CC
Mississippi State, MS 39762

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Will be responsible for the marketing of SIS products and services. Duties will include the development of formal proposals, the development and implementation of strategies for finding new accounts as well as customer liaison and support. The successful candidate must have direct sales experience, knowledge of the marketplace in question, excellent communications skills and, preferably, possess a college degree. Salary base Mid-$20's plus bonus. (Dept. T.W.)

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We seek proven D.P. Sales Professionals who have developed formal proposals and implemented strategies for developing new business and can provide customer liaison and support. MUST be familiar with the D.P. marketplace in question and possess a proven successful background in D.P. sales. Compensation structure includes excellent base salary, sales-incentives and comprehensive benefits. (Dept. M.R.)

NATIONAL ACCOUNTS MANAGER
Valley Forge, Pa. Based

The successful applicant will have demonstrated ability in the development and implementation of programs for securing national accounts for SIS. This position provides excellent earnings, including a substantial base salary, incentive bonus and a complete benefits package, as well as opportunities for unlimited career and financial growth. MUST possess a proven record of success in D.P. sales and have knowledge of the national D.P. marketplace. (Dept. M.R.)

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SYSTEMS SOFTWARE ANALYSTS
Philadelphia Based

Positions are responsible for the development, maintenance, testing and support of the operating system for an IBM 370/168 at our new Sungard Computer Center. In addition you will consult with customer's technical personnel in the development of their IBM Operating System. To qualify you must be experienced in SYSGENing and MVS/JES 2 Operating System, and/or TSO/TCAM, VTAM and 3705 Emulation. Must possess superior written and oral communications skills, degree in Computer Science, or related field preferred. (Dept. A.C.)

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Sun INFORMATION
SERVICES
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Barnett Computing Company provides quality data processing services for the highly respected Barnett Banks of Florida. The challenges of maintaining exacting standards in a fast-paced, growth environment are met daily by a top-notch staff of EDP professionals. You owe it to yourself to consider the career significance of joining our team.

Several new opportunities are now available within our Systems Management Division. Current needs are in the areas of Deposits, Commercial Loans, Trust, General Ledger and Credit Cards. We will require at least 1-1/2 years experience on large scale IBM systems and a thorough knowledge of COBOL and OS JCL. Banking or financial systems experinece is highly beneficial.

We offer excellent incomes, commensurate with expertise, plus a generous benefits package. For immediate, confidential consideration call Carey Kilgore at (904) 731-6146 or send your resume to Barnett Computing Company, Systems Management Division, P.O. Box 1006B, Jacksonville, FL 32207.

Barnett Bank

Barnett Computing Company
A subsidiary of Barnett Banks of Florida, Inc.
An Equal Opportunity Employer, M/F

BANK CARD ADMINISTRATOR

Major holding company presently has an opening for a Bank Card Administrator requiring at least 5 years solid bank operations experience with a minimum of 2 years experience in either a programming or systems environment. Technical knowledge of the installation requirements of ATM's and the ability to communicate effectively at every level are essential.

Now is the time to make your career change with our aggressive, rapidly expanding organization that has over 1.7 billion in assets. Flagship offers an attractive starting salary, paid relocation, an outstanding benefit program and a year-round summer climate. Don't let this unique opportunity pass you by. Please send confidential resume and salary requirements to K. Alvarez, Personnel Administrator.

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FLORIDA
RPGII/CCP PROG/ANAL TO 25K

Due to expansion, our client, the So. Fla. headqtrs. of a software/facilities development co. is actively seeking an individual with strong RPGII/CCP experience. (Background w/hospital systems a plus.) This situation is a ground-floor opportunity, for the right person. Work environment includes dual SYS3/15D's. If you have a desire to work in a really sharp shop, and be in the forefront of technical developments, I want to hear from you. For immediate attention & results, contact Len Payden, Division Manager.

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EDP Division
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(305) 735-1015
Mon.-Fri. 9-5
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Sys Prog - JES2 - Intern	$23K

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Opportunities to contribute individually and in small groups, working on compilers, run-time systems, file systems and major operating systems development. Successful candidates will interact with hardware engineering, advanced systems, logistics and documentation groups. Experience required in ASSEMBLER language and one or more higher level languages, with 1-5 years background in operating systems development. A degree in computer science is preferred.

SOFTWARE PROGRAMMERS

Software project implementation of power plant monitor computer systems. Position involves software systems and applications programming. Fluency in assembly language and experience in real-time data acquisition programming is required.

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Software: Experience in teaching software courses in ASSEMBLY and FORTRAN languages preferably in a real-time environment.
Hardware: Experience in teaching microprocessor based computer systems.

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Work involves developmental firmware design for advanced development group. Minimum of 2 years experience as microcoder and a desire to grow within a dynamic group.

HARDWARE LOGIC DESIGNERS

Responsible for systems and logic design for computer systems. Logic design experience is required and some microprogramming experience is desired. Must be capable of doing cost estimating in support of bidding new job opportunities.

DIAGNOSTICS PROGRAMMERS

Experience required in hardware diagnostics for computer vendor.

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Expereince in drafting, enforcing and administering fixed price government and industrial contracts. Must have knowledge of ASPR with background essential in either legal, business or engineering areas. Some travel reouired.

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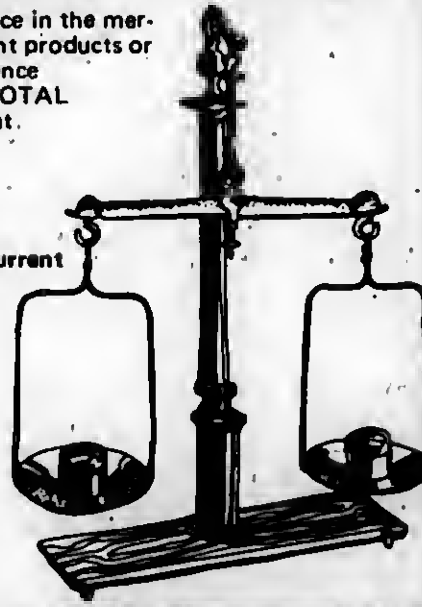
MARKETING PRODUCT MANAGER, DATA MANAGEMENT SYSTEMS

Requires 2 years experience in the marketing of data management products or services. One year experience in the use of MARK IV TOTAL System 2000 or equivalent is highly desirable.



FOR CONFIDENTIAL CONSIDERATION,
send your resume, with current salary, to Fred Brillante, Dept. CW1127.

SYSTEMS
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Experience with a computer manufacturer in software systems design and development plus M.S. in Computer Science or equivalent. Knowledge of design integrity, quality control and project management functions of the softwere development process.

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Please send resume and salary history in strict confidance and/or call: Toll free (800) 327-4989.

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Manager Professional Staffing
Harris Computer Systems Division
2101 Cypress Creek Rd.
Fort Lauderdale, Florida 33309
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COMPUTER SYSTEMS
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SOFTWARE ANALYSTS

Florida Positions

The RCA missile Text Project located at Cape Canaveral on the east central Florida coast has openings for qualified professional Programmer/Analyst and Programmer Trainees to support its requirements on the Air Force Eastern Test Range.

A technical bachelor's degree or the equivalent experience is required. We are strongly interested in individuals with experience in Real-Time applications employing FORTRAN or ASSEMBLY language, and with experience in programming for CDC CYBER 74, CDC-MP60, MODCOMP or DEC computers.

If you qualify and are interested, please send resume in confidence to:

Employment Manager
RCA Missile Text Project
P.O. 4308
Patrick, AFB, FL. 32925

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RCA

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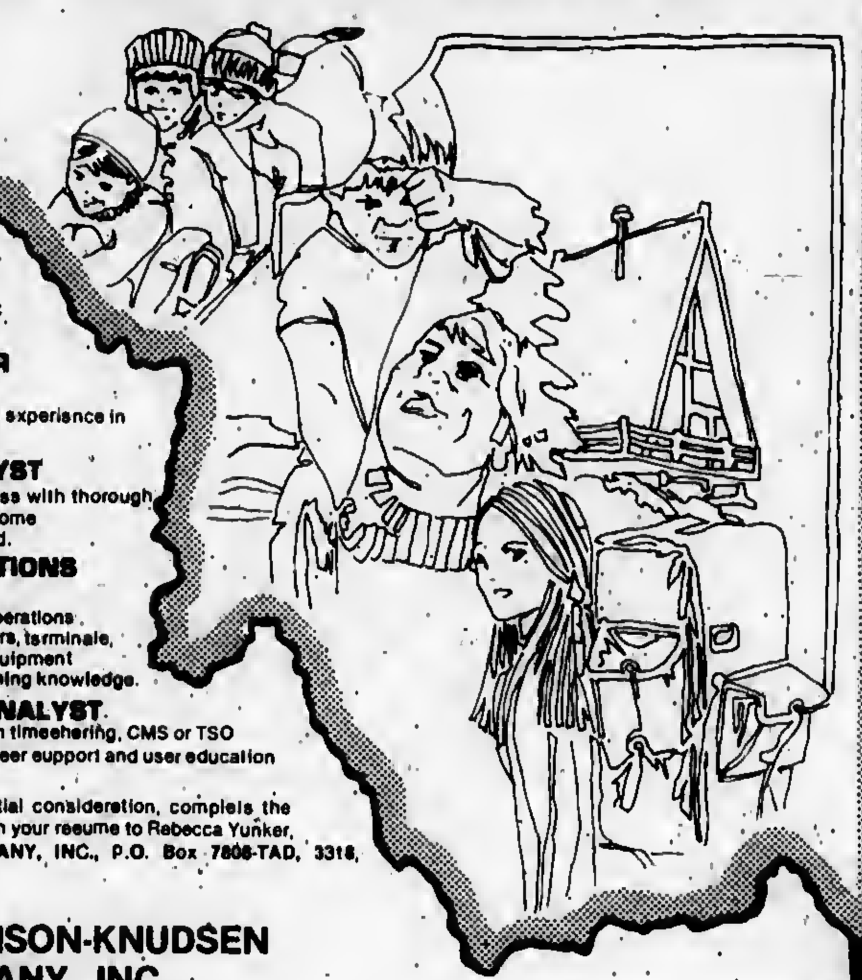
For our Data Processing needs we require the following professionals:

- **PROGRAMMER ANALYST**
  3 - 5 years experience as P/A with commercial construction-industry oriented applications. Distributed processing environment desires T/C background.
- **SENIOR PROGRAMMER ANALYST**
  Proven performance record, 5 years experience in COBOL, CICS, DL/1, Mark IV a plus.
- **OPERATIONS ANALYST**
  5 years experience in IBM 370 series with thorough knowledge ol OS JCL and VSI. Some programming knowledge required.
- **TELECOMMUNICATIONS TECHNICIAN**
  2 - 5 years experience in operations (hardware), i.e., controllers, terminals, telecommunications equipment and RJE, with programming knowledge.
- **TIMESHARE ANALYST**
  2 - 3 years experience with timesharing, CMS or TSO preferred. Experience with user support and user education desirable.

For immediate and confidential consideration, complete the information sheet and send with your resume to Rebecca Yunker, **MORRISON-KNUDSEN COMPANY, INC., P.O. Box 7808-TAD, 3318, Boise, Idaho 83729.**



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D.P. INFORMATION
(clip)

NAME ____
ADDRESS ____ CITY ____ STATE ____ ZIP ____
HOME PH. (___) ____ BUSINESS PH. (___) ____
JOB APPLYING FOR ____
HARDWARE EXPERIENCE:
IBM ____ NO. OF YRS. ____ MOST RECENT YR. ____ 360 ____ 370 ____
WANG MINI-COMPUTERS (CPU) ____
ADDITIONAL HARDWARE ____
LANGUAGE EXPERIENCE:
COBOL ____ CMS ____ ASSEMBLER ____
MARK IV ____ CICS ____ FORTRAN ____
DL/1 DATA BASE (IMS) ____
OPERATING SYSTEMS:
JCL ____ OS types ____ VM/CMS ____
VS/1 ____ MVS ____ OS ____ CICS ____
APPLICATIONS:
ENGINEERING ____ FINANCE ____
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PRESENT SALARY $____ SALARY REQUIRED $____

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Several years experience on large scale computer systems is necessary. Aftar savaral months training on tha Super Scale CRAY 1, the successful candidata will ba assignad to a customer site.

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This position requires praparing text for manuals, brochures and technical articles that support our hardware or soltware product. Some involvement with customar proposed offers may be required.

This individual should have a minimum of 3-5 years experience as a wrltar in the computar field with a good background in electronic hardwara. Position is available in Chippewa Falls, Wisconsin, one of Wisconsin's most attractive and scenic recreational areas.

In addition to a highly compatitive compensation, and banefit package, you will be joining a highly successful and growing organization. Please submit resuma and salary history in confidenca to:

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SYSTEMS PROGRAMMERS

Here is your chance to take advantage of a full range of exciting opportunities that currently exist at the First Netional Benk of Boston for experienced IBM OS/VS Systems Programmers and Assembler Programmers. While providing quality systems software support to our Data Center and User community, you will be working with MVS 3.7, JES2, making extensive use of TSO on IBM 3032, 3350, and 3800 hardware.

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Our company, a leader in the proprietary software market, has expanded its customer base et a record-setting pace and needs to add to its Client Services staff. Responsibilities would include training and working with new and existing clients as well es involvement in sales support activities.

IF YOU:

- Have a college degree
- Have e minimum of 3 years systems design and programming experience in COBOL, FORTRAN or Assembler (IBM environment)
- Have OS or DOS JCL knowledge
- Have exposure to Data Base Systems (IMS, TOTAL)
- Are an ambitious, self-starting individual who would enjoy considereble travel
- Have experience or aptitude in training procedures

WE OFFER:

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- Opportunity for rapid advancament

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Group Leader, Client Services

Program Products Incorporated
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OPPORTUNITIES FOR PROGRAMMER ANALYSTS IN PHOENIX

To meet tha challenges presented by e growing organization, our Menagement Informetion Systems Group is seerching for quality systems professionels to become pert of our Corporate Heedquerters staft You will have en opportunity to test your skills in a state of the ert environment thal encourages creativity and initiative

The opportunities we're telking ebout require heevy experience with lerge scele IBM equipment (converting to 3033) using COBOL in an OS/MVS environment. Experience with online systems end TOTAL DBMS would be a definite advantage Heevy user interface mekes excellent communications skills necessary

If this sounds like the opportunity you've been looking for end ere interested in relocating to en eree noted for its casual, triendly lifestyle end ettractive climate, send us your resume Tell us whet you've done, your career goels and selery requirements

John Merques, Jr.
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North Carolina

PROGRAMMER/ANALYST

Midpoint $22,000 Fee Paid

Needed Cobol programmer/analyst. Project management a plus. ROSCOE a plus. 2 to 3 yrs. experience programming. This position is with a leading bank. Environment: 370/158, OS/VS1, CICS.

We currently hava several hundred openings for Cobol programmers & analysts in the Southeast.

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An Arby's Franchise operator with over 50 restaurants in Grand Blanc, Michigan is looking for a Systems Programmer Analyst to help in the development of a business management system on a Honeywell Level 62. The candidate should have 1-3 years experience in an IBM Systam 3-8. Honeywell 62 or larger installation RPG II experienca required with COBOL and communications experience a strong plus, Send resume and selary history to:

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Manager of Systems Support, TOTAL, CICS	to $38K
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BREEN DATA Division of the Breen Group, Inc

Name____________________
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Telephone ( )__________ Present salary__________

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programmers

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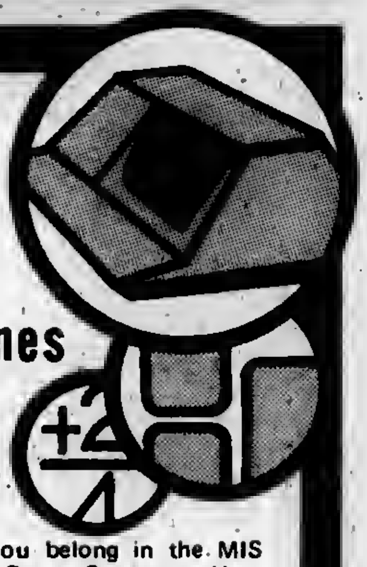

If you've checked box three, you belong in the MIS Depertment at the Hammermill Paper Compeny. Here you'll find an environment that may even be e step ahead of tomorrow.

We're moving now into the 3031 generetion - en event that provides exceptional opportunities for you to extend your reach, imagination and technical scope.

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Should be shirt-sleeves lead analyst with desire to move ahead on the strength of your data-base IMS experience.

SR. APPLICATIONS PROGRAMMER

Needs full project applications experience with technical competence for progrem design, coding, testing on accounting/financial applications.

Both corporate-heedquerters positions are located in e pleasant, progressive city thet is the center of popular year-round recreationel aree. It offers excellent living opportunities et costs modest in comparison to most metropoliten erees.

Selaries are excellent, commensurete with experience. And complete benefits peckege includes fully peid relocation. Send resume in confidence to: J.L. Heimbold, Menager, Corporete Recruiting

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SYSTEMS PROGRAMMER

Bachelor's in Computer Science and three (3) years of progressively responsible business computer programming experience, one (1) year of which has involved generation of high-level operating systems; OR High School graduation and five (5) years of progressively responsible experience as above, three (3) years of which have involved generation of high-level operating systems.

Send letter of application and resume to Susan M. Bondy, Personnel Bureau, room 103A, 30 Church St., Rochester, New York, 14814.

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Position Wanted

POSITION WANTED

Programmer/Analyst with 5 years experience in banking, insurance and distribution business systems seeks a new position in New Jersey. Well-conversant with COBOL, BAL, PL/1 and JCL languages. Experience includes Amdahl 460/V6, IBM 370/168 and 3032 machines, MVS operating system, TSO/SPF, Panvalet, Improved Programming Technique. Presently employed by a big bank in Montreal, Canada and on the waiting list of U.S. immigration visa. Interested party please write to:

CW Box 1758
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SYSTEMS ENGINEERS

- **Multi-Microprocessor Systems**
- **Distributed Processing**
- **SDLC Communication Networks**

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- **6080 Based Microprocessor Design**
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Dept. P50
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Systems Programmer

If you're a good systems programmer, take time to explore this growth opportunity with Signetics, the Good People Company. Because we're good, we've enjoyed several years of steady growth -- and we're a recognized leader in the design, manufacture and sales of integrated circuits.

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If you possess a BS in Computer Science, and have 5-10 years of related experience, we'd like to talk with you.

Please send your resume in confidence to Signetics, Job 9003, 811 East Arques Avenue, Sunnyvale, CA 94086. We are an equal opportunity employer m/f.

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programmers

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We are looking for DP professionals who have the capability to provide the technical instruction to support our programming and operations staff in an IBM 370/MVS/COBOL environment. With the proper background, we will assign you immediately to responsibilities as a Course Developer, Lecturer, Workshop Leader or Tutor. You will also be trained in all of the latest DP technologies (a benefit most programmers don't receive.)

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Prior teaching experience is preferred but not mandatory.

In return for your technical know-how, we offer an excellent package of compensation that includes top benefits and exciting potential for growth. For confidential consideration, please send resume and salary history to:

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THE OPPORTUNITY

To assume immediate responsibility for directing the activities of an aggressive, nine-person DP team.

THE COMPANY

JLG Industries, Inc., leading manufacturer of hydraulic mobile aerial working platforms and industrial cranes. The company is also public trading OTC.

THE LOCATION

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THE POSITION REQUIREMENTS

Experience in using IBM System 3/15D equipment with disk input and storage. Working knowledge of RPG-II required; FORTRAN would be a plus.. Data collection through on-line terminals desirable.

Experience in using IBM System 3/15D equipment with disk input and storage. Working knowledge of RPG-II and CCP required; working knowledge of FORTRAN 4 and IBM's IPICS software a plus. Experience with data collection devices and IBM System 34 are also a plus.

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New, modern equipment and facilities.
Liberal, extensive employee benefits package.
Excellent long range growth potential.

Qualified applicants are requested to submit complete resume of training and experience background, including current financial requirements, to: Sam Swope, Personnel Department.

JLG INDUSTRIES, INC.
JLG Drive
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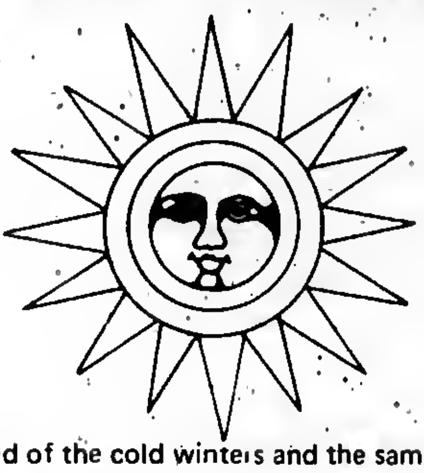
SUN BELT OPPORTUNITY



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We will be conducting interviews for experienced project managers, programmer/analysts, analysts, programmers, technical support personnel and operations managers with a life insurance background.

Interviews will be conducted

Hartford, Connecticut on December 9 & 10, 1978
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For further information and to schedule a personal interview, call Carole Oliver COLLECT at 404/524-6666. OR send your resume to

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We are interested in talking with Analysts who have experience in any of the following areas:

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- Virtual Memory programming
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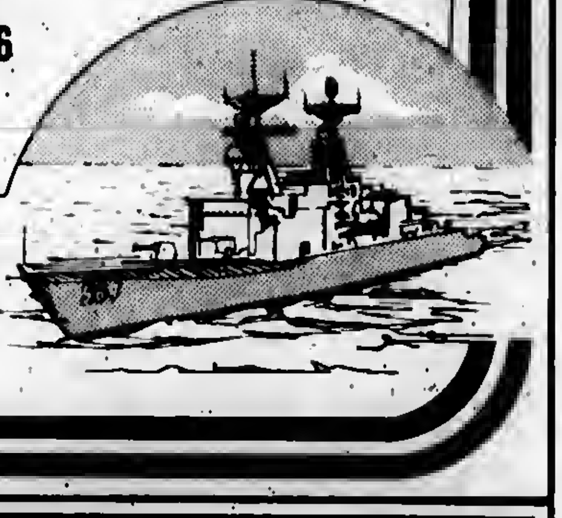

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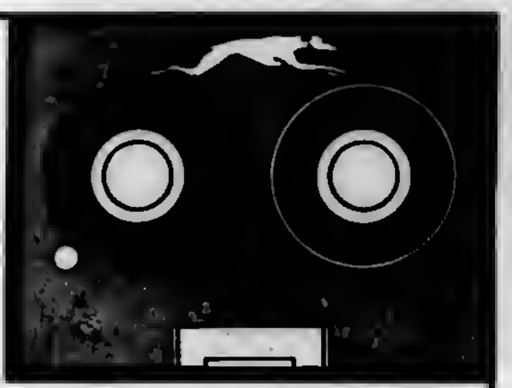

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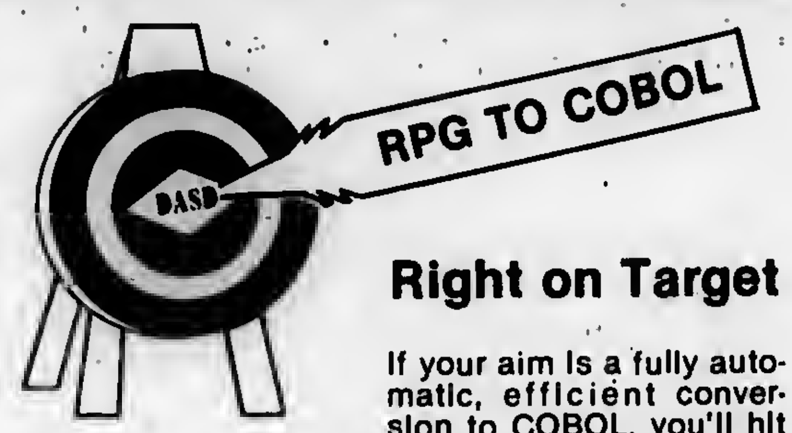

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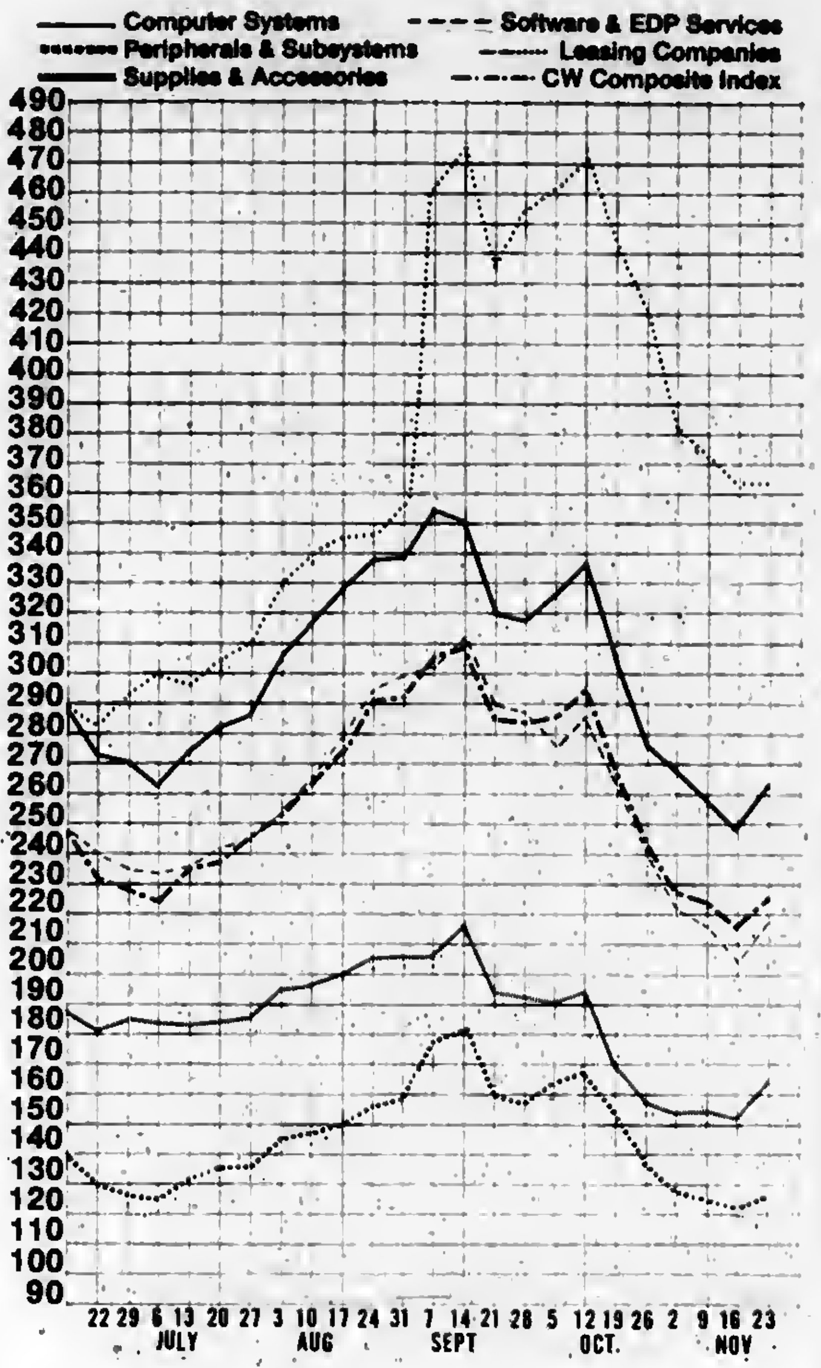

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Year Ended Sept. 30

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Shr Ernd	$1.02	.....
Revenue	86,320,000	$66,761,000
Tax Cred	1,075,000	.....
Earnings	4,425,000	(3,569,000)
3 Mo Shr	.42	.....
Revenue	24,018,000	18,411,000
Tax Cred	467,000	.....
Earnings	1,879,000	(1,000)

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Three Months Ended Sept. 30

	1978	1077
Shr Ernd	$.18	$.18
Revenue	3,578,000	a3,102,000
Earninge	252,000	281,000
9 Mo Shr	.48	.56
Ravenue	10,389,000	a9,107,000
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a-Restated.

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Three Months Ended Sept. 30

	1978	1977
Shr Ernd	$.38	$.22
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Earninge	1,018,000	588,000
6 Mo Shr	.82	.32
Revenua	21,030,000	14,182,000
Eernings	1,646,000	829,000

INFOREX
Three Months Endad Sept. 30

	1978	1977
Shr Ernd	$.30	$.16
Revenue	17,599,000	16,373,000
Tax Cred	131,000	115,000
Eernings	994,000	534,000
9 Mo Shr	.67	.38
Revenue	50,728,000	45,955,000
Tax Cred	284,000	201,000
Earnings	2,140,000	1,075,000

a-Rastatad to reflect accounting change for leeses.

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PAICES WEDNESDAY, NOVEMBER 21, 1978

All statistics compiled, computed and formatted by
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Cambridge, Mass. 02139

EXCN		1978 RANGE 111	CLOSE NOV 21 19T8	WEER NET CHNGE	WEER PCT CNNGE
	COMPUTEA SYSTEMS				
A	AMOAHL CORP	28- 69	46 3/8	+3 3/4	+8.7
N	BURPOUGNS CORP	59- 8T	70 T/8	+ T/8	+1.2
O	COMPUTER AUTOMATION	15- 44	17 1/2	+ 1/2	+2.9
N	CONTROL OATA CORP	23- 44	31 T/8	+2 3/8	+8.0
O	CRAY RESEARCN INC	21- 74	2T	+3 1/2	+14.8
N	OATA GENERAL CORP	42- 71	58 1/8	+3	+5.4
N	OATAPOINT CORP.	34- 75	58	+5	+9.4
N	OIGITAL EOUIPMENT	39- 54	47 3/4	+1 1/8	+2.4
N	ELECTRONIC ASSOC.	2- 13	7 1/8	+ 5/8	+9.6
A	ELECTAONIC ENGINEER.	9- 19	11 1/2	+1 1/8	+10.8
N	FOUR-PNASE SYSTENS	19- 46	2A 1/8	+1 1/8	+4.5
N	FOXBORO	28- 40	32 1/2	+1 1/2	+4.8
O	GENERAL AUTOMATION	7- 26	13 3/4	+1 1/4	+10.0
O	GPI COMPUTEP COPP	1- 3	1	0	0.0
N	NEWLETT-PACKARO CO	62- 93	81 3/4	+2 7/8	+3.6
N	HONEYWELL INC	43- T2	63 3/4	+2 3/4	+4.5
N	IBN	236-305	264	+5 1/2	+2.1
O	MANAGEMENT ASSIST	9- 29	16 1/2	+1 1/8	+7.3
O	NANUFACTURING DATA S	9- 23	18 3/4	+1 3/4	+10.2
O	MICROOATA CORP	13- 23	18 1/4	+2 3/4	+1T.7
O	MINI-COMPUTER SYST	4- 8	4 3/4	+ 1/2	+11.7
O	NODULAR COMPUTEP SYS	7- 17	8 1/2	+1	+13.3
N	NCP	3T- 6T	58 1/8	+1	+1.T
N	PRINE COMPUTEP INC	20- 43	26 T/8	+ T/8	+3.3
N	PEPKIN-ELNEP	1T- 28	25	+1 1/8	+4.7
N	SPEPPY RANO	33- 49	41 1/2	+ 3/4	+1.8
A	SYSTENS ENG. LABS	11- 24	12 T/8	+ 3/8	+3.0
O	TANOEN COMPUTEPS INC	13- 37	26 1/2	+1 3/4	+T.0
A	WANG LABS.	12- 32	23 1/4	+3 1/4	+16.2
	LEASING CUMPANIES				
O	BOOTHE COURIER CORP	13- 21	17 1/4	0	0.0
O	COMDISCO INC	5- 22	14 1/4	+1 1/2	+11.7
A	COMMERCE GPOUP COPP	1- 1	1/4	- 1/8	-33.3
A	COMPUTER INVSTRS GRP	1- T	2 3/4	- 3/4	-21.4
O	CONTINENTAL INFO SYS	5- 15	6 1/2	+ 1/4	+4.0
N	DATRONIC RENTAL	1- 3	2 1/8	- 1/4	-10.5
P	DCL INC	3- 5	3 1/2	+ 3/8	+12.0
N	DPF INC	8- 14	9 T/8	+ 3/4	+8.2
N	ITEL	16- 36	24 1/4	+2 7/8	+13.4
N	LEASCO CORP	24- 36	32 3/4	+ 7/8	+2.7
O	LEASPAC CORP.	1- 4	3	+ 1/2	+20.0
A	PIONEER TEX CORP	3- T	3	- 3/8	-11.1
N	U.S. LEASING	13- 20	14 1/4	+ 3/8	+2.7

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L=NATIONAL; N=NIDWEST; O=OVER-THE-COUNTER
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EXCH		1978 AANGE (1)	CLOSE NOV 21 1978	WEER NET CHNGE	WEEA PCT CNNGE
	SOFTWARE & EOR SERVICES				
O	AOVANCEO COMP TECH	1- 2	1	0	0.0
O	ANACOMP INC	8- 22	11 1/2	+ 3/4	+6.9
A	APPLIEO OATA RES.	8- 1T	9 3/4	+ 3/4	+8.3
N	AUTOMATIC OATA PROC	24- 36	30	0	0.0
O	COLENAN ANERICAN COS	1- 2	7/8	- 1/8	-12.5
O	CONPU-SERV NETWORR	6- 12	6 1/4	0	0.0
O	COMPUTER NORIZONS	1- 9	5 3/4	+ 1/4	+4.5
O	CONPUTER NETWOAK	6- 1A	6 3/4	+ 1/4	+3.8
N	CONPUTER SCIENCES	8- 17	11 1/8	+1 1/2	+15.5
O	COMPUTER TASR GAOUR	1- 4	4 1/2	+ 3/4	+20.0
O	CONRUTER USAGE	2- 4	2 1/4	+ 1/8	+5.8
O	COMPUT AUTO AEP SVC	4- 10	5 7/8	+ 1/4	+4.4
O	CONSHARE	6- 19	13 1/4	+ 3/4	+6.0
O	CULLINANE COAP	14- 33	17	+2 1/4	+15.2
O	OATA DIMENSIONS INC	4- 9	4 5/8	+ 3/8	+8.8
O	DATATAB	1- 2	1	0	0.0
N	ELECTRONIC OATA SYS.	15- 25	17 7/8	- 1/8	-0.6
O	INSYTE CORP	1- 3	1	0	0.0
O	IPS COMPUTER NARKET.	2- 3	3 1/4	0	0.0
O	REANE ASSOCIATES	3- 6	4 1/2	+ 1/4	+5.8
O	REYOATA CORP	1- 3	2	+ 1/4	+14.2
A	LOGICON	10- 19	11	+ 3/4	+7.3
A	NATIONAL CSS INC	15- 36	24 1/8	+1 1/4	+5.4
O	NATIONAL OATA CORP	T- 13	8 1/4	+ 1/4	+3.1
A	ON LINE SYSTENS INC	12- 30	15 3/4	+2	+14.5
N	RLANNING RESEARCN	4- 10	6 1/2	+ 3/4	+13.0
O	PROGPANNING & SYS	1- 1	1 1/4	0	0.0
O	RAPIDATA INC	3- T	4 1/8	+ 1/8	+3.1
O	REYNOLOS & REYNOLO	18- 36	29	+2 1/2	+9.4
O	SCIENTIFIC CONPUTERS	3- 9	5 3/4	+ 1/4	+4.5
O	TYNSHAPE INC	18- 33	25 1/4	+2 1/4	+9.7
A	UPS SYSTENS	5- 8	6 1/8	+ 1/4	+4.2
N	WYCY CORP	1- 7	3 7/8	+ 1/8	+3.3
	PEPIPHEPALS & SUBSYSTENS				
N	ADORESSOGRAPH-NULT	14- 32	22 3/4	+2 1/2	+12.3
O	AOVANCEO NEMOPY SYS	7- 18	12 1/8	+1 1/2	+14.1
N	ANPER CORP	10- 19	14 1/2	+1 1/2	+11.5
O	ANDEPSON JACOBSON	5- 10	5 5/8	+ 3/8	+7.1
N	APPLIEO OIG OATA SYS	9- 22	9 1/4	+ 1/4	+2.7
O	BFEHIVE INT'L	3- 7	3 5/8	+ 7/8	+31.8
A	BOLT,BERANEK & NEW	6- 14	9 5/8	+ 3/8	+4.0
N	BUNKER-PAMO	10- 20	14 T/8	+2 3/4	+22.6
A	CALCOMP	3- 13	6 5/8	- 1/4	-3.6
O	CAMBRIDGE MEMORIES	3- 9	4 3/8	+ 3/4	+20.6
N	CENTRONICS OATA CONP	16- 37	24 1/2	+ 3/8	+1.5
O	COGNITRONICS	1- 4	1 3/4	+ 1/4	+16.6
O	COMPUTER CONNUN.	6- 12	4 5/8	+ 3/4	+19.3
O	COMPUTEP CONSOLES	4- 10	7 1/4	+1 1/4	+20.8
A	COMPUTEP EQUIPMENT	3- 6	4	+ 1/4	+6.6
O	COMPUTER TRANSCEIVER	1- 3	3	0	0.0
O	COMPUTERVISION COPP	9- 30	20 1/2	- 3/4	-3.5
O	CONTEN	9- 38	12 3/4	-11 3/4	-47.9
N	CONPAC CORP	13- 26	14 3/8	+ 7/8	+6.4

EXCH		1978 RANGE 111	CLOSE NOV 21 19T8	WEER NET CNNGE	WEEA RCT CHNGE
O	OATA ACCESS SYSTEMS	3- 14	12 1/4	- 1/2	-3.9
O	OATA 100	9- 20	19 5/8	+ 1/4	+1.2
A	DATA PRODUCTS CORP	14- 25	16	+1 3/4	+12.2
O	OATUN INC	2- 6	2 1/2	- 1/8	-4.7
O	OECISION OATA CONPUT	2- 6	3 1/8	+ 3/8	+13.6
O	OELTA OATA SYSTENS	1- 1	3/4	- 7/8	-53.8
A	DOCUNATION INC	6- 34	19 T/8	+2 1/4	+12.T
O	DATARAM CORP	6- 32	20	0	0.0
N	ELECTRONIC N & N	4- 9	4 3/4	+ 1/2	+11.7
O	FABRI-TER	1- 2	1 1/8	-	-5.3
O	GENEAAL CONPUTEP SYS	1- 3	1 5/8	+ 1/4	+18.1
O	GENERAL OATACOMM INO	9- 21	10 1/2	0	0.0
N	NAZELTINE CORP	10- 17	11 1/4	+ 7/8	+8.4
N	HARRIS CORP	1T- 36	29 5/8	+ 3/8	+1.2
O	INFORER INC	6- 11	6 3/8	- 1/8	-1.9
O	INFORMATION INTL INC	7- 12	7	- 1/4	-3.4
O	INFOTON	1- 3	2 1/4	0	0.0
O	INTEL CORP	39- 62	49	+3	+6.5
A	LUNOY ELECTRONICS	4- 8	4 3/8	- 1/4	-5.4
O	NSI OATA CORP	10- 19	11 3/4	+ 3/8	+3.2
N	MENOREX	2T- 59	30 7/8	+3	+10.7
N	MOHAWR OATA SCI	6- 15	8 5/8	+1 1/4	+16.9
O	OMER	2- 6	5 1/2	0	0.0
O	PARAOYNE COPP	9- 17	9	+ 1/8	+1.4
O	PENRIL CORP	5- 12	9 1/4	+ 1/8	+1.3
N	RERTEC CORP	9- 17	10 3/4	0	0.0
A	POTTER INSTRUNENT	2- 2	1 3/4	0	0.0
O	QUANTOR COPP	2- 5	2 5/8	0	0.0
O	RECOGNITION EQUIP	7- 13	8	+ 1/8	+1.5
O	SCAN DATA	1- 5	1 7/8	- 1/8	-6.2
N	STORAGE TECNNOLOGY	19- 46	26 3/8	+2 3/4	+11.6
O	T BAR INC	11- 20	14 1/4	+ 3/4	+5.5
O	TALLY CORP.	4- 9	8	+1 1/4	+18.5
A	TEC INC	6- 13	6 3/4	+ 1/4	+3.8
N	TERTRONIR INC	33- 50	44 3/4	+2 3/4	+6.5
N	TELEK	3- 9	5 1/4	+ 1/2	+10.5
O	TESOATA SYSTENS CP	9- 23	9 1/4	- 1/2	-5.1
O	WILTER INC	1- 2	T/8	- 1/4	-22.2
	SUPPLIES & ACCESSOPIES				
A	ANEPICAN BUS PROOS	6- 11	7 5/8	- 3/8	-4.6
O	BALTINOPE BUS FORNS	2- 4	1 1/2	+ 1/2	+50.0
A	BAPRY WRIGHT	14- 30	23 5/8	+3 5/8	+18.1
O	CYBERNATICS INC	1- 1	5/8	0	0.0
O	OUPLER PRODUCTS INC	13- 30	17	+1 1/2	+9.6
N	ENNIS RUS. FORMS	8- 17	10 5/8	- 1/4	-2.2
N	3N CONPANY	43- 66	60 3/8	+2 3/8	+4.0
O	MOOPE CORP LTO	26- 34	28 3/4	+ 1/4	+0.8
N	NASHUA COPP	18- 37	23 1/8	+ 3/4	+3.3
O	STANOARD REGISTEP	20- 2T	22 3/4	+1 1/4	+5.8
A	TAB PRODUCTS CO	8- 16	9 3/4	+ 1/4	+2.6
N	UAPCO	19- 47	46 3/4	+8 1/8	+21.0
A	WABASH NAGNETICS	10- 22	14 3/4	+1 1/4	+9.2
N	WALLACE BUS FORMS	18- 33	22 3/4	+1	+4.5

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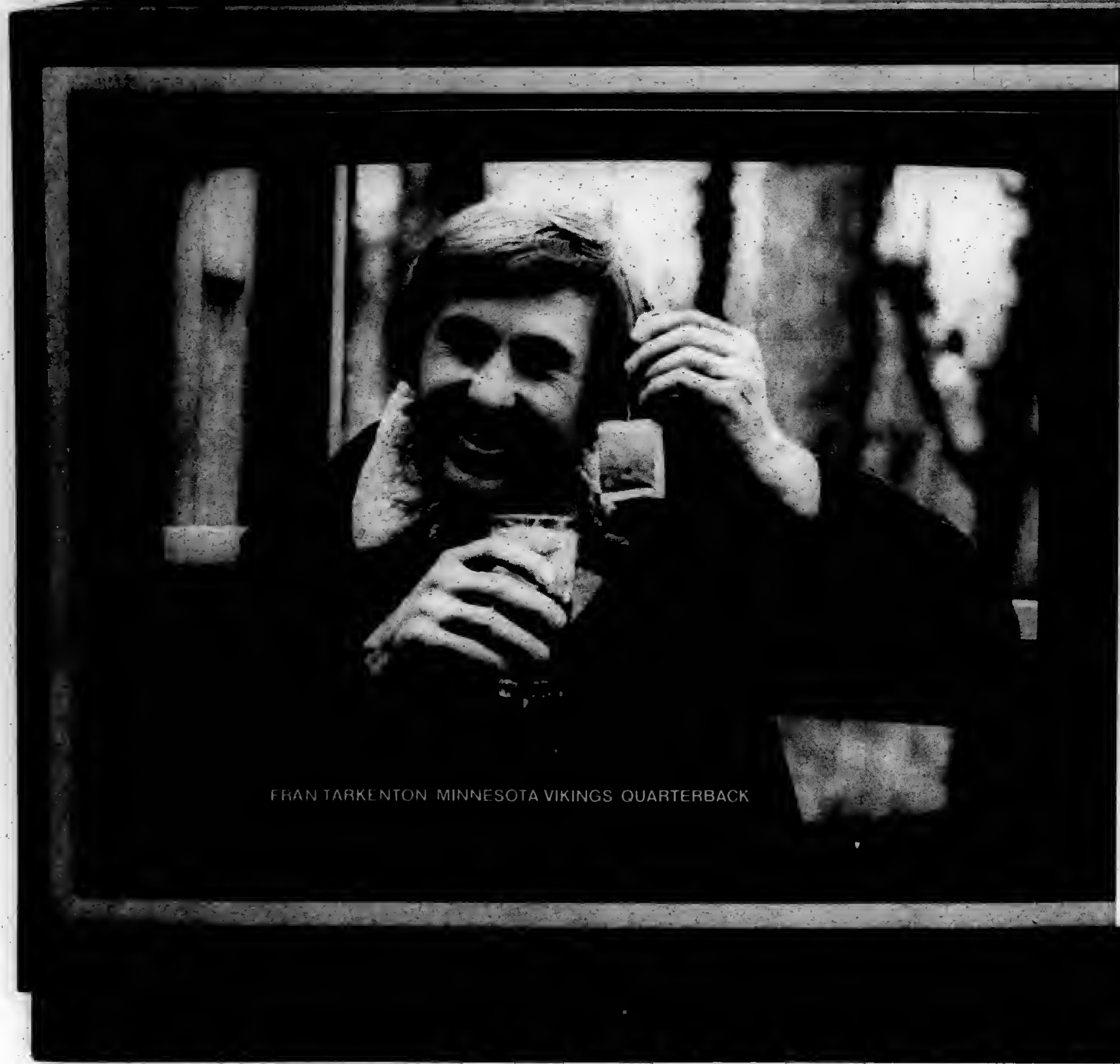

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NEWSPAPER

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vice Vendors Move Into Systems Area

• STSC Backs APL Users

By Don Leavitt
CW Staff

BETHESDA, Md. — Users seeking more in-house support for APL-oriented operations got promises of it in spades last week.

Scientific Time Sharing Corp. (STSC), a major U.S. remote computing services vendor keyed primarily to APL, announced plans to market an IBM 370-compatible "minicomputer," its own APL-Plus language support system, a series of VSAPL enhancements for use with IBM's APL and a pair of application packages written in APL but usable by even those without APL knowledge.

The STSC "mini," which is expected to be available in two models that outperform the IBM 370/138 and 148, can be used as a stand-alone system or as an extension to APL-Plus service on the company's network, a spokesman said. To be known as the Quad 100, the "mini" will be offered with its own APL-Plus but will handle any of the languages now available on its IBM

(Continued on Page 6)

• GE Brings Out Marklink

By E. Drake Lundell Jr.
CW Staff

NEW YORK — General Electric Co.'s Information Services Division jumped into distributed data processing here last week with a system that provides remote minicomputers, telecommunications, host processing and applications software.

Called the Marklink system, the offering is based on a minicomputer-based terminal system manufactured by Texas Instruments, Inc. to GE specifications and takes advantage of the existing telecommunications network and large host processing centers in GE's time-sharing operation.

GE officials, however, emphasized that the system is not just an extension of its time-sharing services, but rather a transaction processing-oriented system.

The Marklink processor is said to be in the class of IBM's recently announced 8100 information system and comes in memory sizes ranging from 24K to 352K bytes. Up to 16 CRT terminals with Ascii keyboards can be attached to each processor, with each display offering 24 lines of 80 characters. The CRTs can be located up to 2,000 feet from the processor.

The minicomputer can accommodate two floppy disk drives with a total capacity of 20M bytes and a printer. It contains a built-in Bell 201C-compatible modem that operates at 2,400 bit/sec, GE said.

A Terminal-Oriented Processing Language (TPL) is available for application development on the minicomputer.

While the system could be used as a stand-alone processor, Arthur B. Sims, manager of GE's distributed systems program, said it would not be marketed for such applications. Instead, the firm will concentrate on distributed applications, initially in the areas of order entry and inventory control.

In such applications, the processors would be linked to GE's large computer centers in Maryland and Ohio in the U.S. and in The Netherlands. Presently, GE said, 5,000 customers are using those centers — which contain a wide range of computer equipment — for time-sharing and remote batch operations.

The software used for transaction processing at the host center is an extension of GE's Fortran 77 (F77). It is

(Continued on Page 8)

Despite Major Snowstorm

Canadian Show Draws Big Crowds

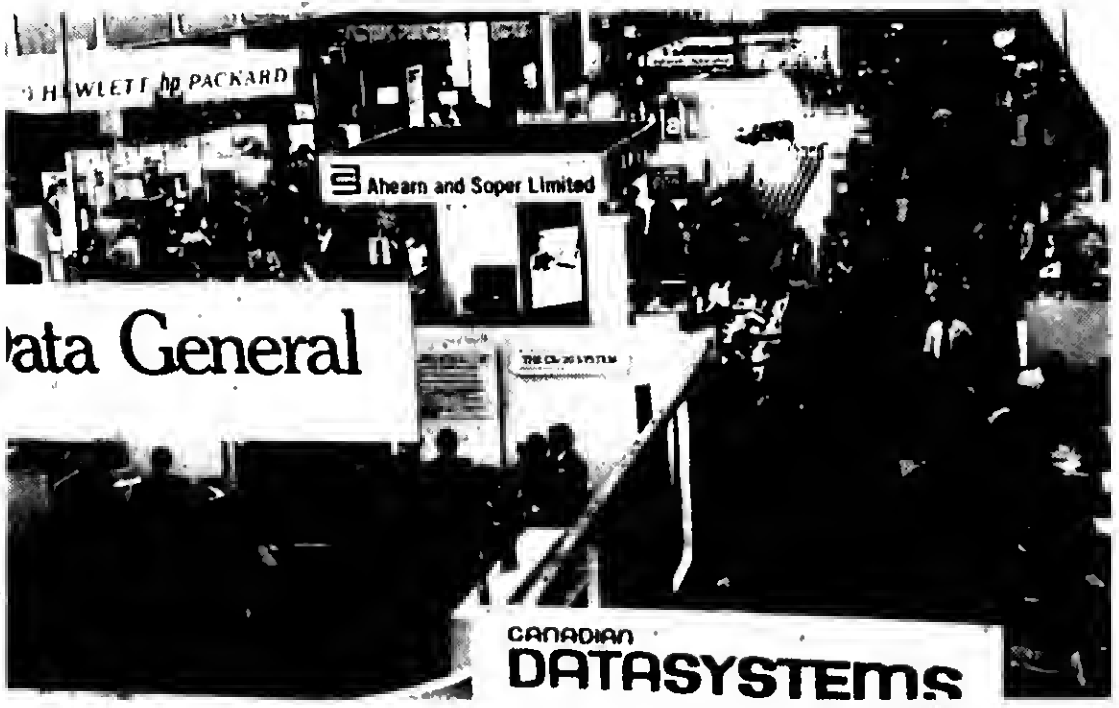
By Tim Scannell
CW Staff

TORONTO — Subfreezing temperatures and the area's first major snowstorm this year failed to keep the crowds away from last week's Canadian Computer Show and Conference at the International Centre of Commerce here.

More than 12,500 people jammed into the convention hall on opening day last Tuesday and eagerly roamed the red-carpeted aisles of the show floor to type on computer terminals, listen to vendor spiels and fill plastic shopping bags with an assortment of product literature. The three-day show attracted 25% more people than last year, according to show manager Reg Leckie, and a minor parking problem outside the Centre of Commerce was solved when the overflow was directed to a nearby bingo hall's lot.

Aside from the standard buttons, badges, stickers and flags passed out by the vendors, daily drawings were held for color television sets, home computers, watches and vintage wines. If those goodies weren't enough to entice the DP executives, managers and students to each vendor's wares, there were also a number of computerized pied pipers scrambling across the floor whose high-pitched blips and bleeps drew spectators by the dozens.

(Continued on Page 4)



CW Photo by T Scannell

Executives, students and DP enthusiasts flooded the aisles of Toronto's International Centre of Commerce last week for a glimpse of the latest offerings. Coverage of the Canadian Computer Show and Conference continues on Pages 4 and 5.

Users Blast U.S. Inaction

By E. Drake Lundell Jr.
CW Staff

NEW YORK — Computer users from large multinational corporations blasted the U.S. government last week for its failure to deal with the issues of transnational data flow.

In an informal, not-for-attribution meeting held here at the close of one of the sessions of a conference on "Data Regulation: European and Third World Realities," sponsored by On-Line Conferences Ltd., the 30-some users indicated that the lack of a U.S. policy is hurting their operations around the world.

The group, mainly comprised of the top DP people in some of America's largest corporations as well as representatives of the computer and time-sharing industries, made the first tentative steps toward establishing an ad hoc committee to lobby on the issue.

Speaking as individuals and not for their companies per se, members of the group said there is a real need to impress Congress and the White House with the importance of the issues and the need for an overall information policy for the U.S.

"Today no one in our government has

(Continued on Page 4)

Amdahl Eases MVS Use

By Don Leavitt
CW Staff

SAN FRANCISCO — Software that enables users of Amdahl Corp. 470 mainframes to run IBM's Multiple Virtual Storage (MVS) control program more efficiently under the Virtual Machine (VM/370) facility was announced here last week.

Describing the VM/Performance Enhancement (VM/PE) package to an Amdahl Users Group meeting, an Amdahl spokesman said throughput improvement is the software's major benefit. With VM/PE in place, users can run MVS under VM/370 with "greater than 90% of MVS native state throughput."

First deliveries of the enhancement package are scheduled to go out to users in February.

VM/PE "recognizes the mutual independence and unique value" of VM/370 and MVS, but it avoids the "very high levels" of system overhead that have previously made the combination extremely costly and inefficient to run, the spokesman continued.

Because each required so much overhead, the initial attempts to use

(Continued on Page 2)

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But MTM Continues

Safeway Warehouse Strike Settled

By Marcy Rosenberg
CW Staff

RICHMOND, Calif. — Union workers at the Safeway Stores, Inc. warehouse here are back on the job after settlement of a four-month strike that protested management's use of a computer-based system for increasing productivity.

But the system — which assigns workers maximum times to complete specific assignments — is still up and running, although its fate is uncertain.

The settlement calls for Safeway and Teamsters Union Local 315 to appoint representatives to a study group to determine whether the productivity program is reasonable, according to a Safeway spokeswoman. Union employees claimed the system, implemented in April 1977, increased their workload 50% to 100% and caused 90% of the warehouse workforce to be fired, suspended or reprimanded for poor performance [CW, Nov. 13].

They also objected to the Method Time Measurement (MTM) standards on which the system is based. MTM assigns average time values to a variety of body motions based on a person's height, weight and age.

Two Choices

Safeway implemented the computerized MTM system at Richmond because productivity there was the lowest of all its domestic warehouses, the firm said. Safeway engineers developed the software for the system, which runs on the firm's IBM 370/168 computer used for order and billing applications at Safeway's Oakland, Calif., headquarters.

The firm is offering Local 315 two choices: a northern California study group to examine the Richmond MTM system only or a national study group to evaluate all such systems used by Safeway.

Six other Safeway warehouses use the MTM system and "while we have had no other strikes over it," the spokeswoman said other union locals submitted the MTM program to arbitrators who, in each case, ruled in Safeway's favor.

Local 315 can also bring the matter to arbitration if the study group can't agree on whether to scrap, modify or rubber stamp the Richmond MTM system, according to John Bacon, vice-president of the Food Employers Council, management's bargaining representative.

Meanwhile, the MTM standards are still at work in that warehouse, but Safeway agreed to withhold discipline "unless a person has demonstrated the ability to perform at a certain pace and is deliberately retrograding."

During the strike, Bacon said, Safeway found that substitute employees — mainly management personnel and "people off the streets" — had "little difficulty meeting the MTM standards and outperformed the regular workforce." Local 315 claimed it never received documented evidence of this.

Though "unhappy" with the settlement, the union agreed to it because "we've been out for four months and didn't get sanctions from the International to extend the strike," according to Ron Teninty, Local 315 union steward and strike coordinator.

The workers, Teninty said, don't object to a computer-based system to measure productivity, but are concerned that the MTM system would be used "solely as grounds to discipline people."

Amdahl Backs MVS on 470

(Continued from Page 1)

MVS under VM/370 were inefficient. Although IBM has made various moves to ease the load, Amdahl clearly felt something more was needed.

With VM/PE installed, users will be able to perform "many previously difficult and often unaffordable tasks," with a single mainframe, the spokesman claimed.

VM/PE is the second software product Amdahl has announced in the past six months to enhance the use of MVS on its CPUs. The first — MVS/SE Assist, introduced in June [CW, June 26] - allows IBM's MVS/Systems Extensions selectable unit to run on the 470s.

The products have significance beyond the use of MVS, however. They are the first major software offerings Amdahl has introduced as its own, industry observers noted.

That suggests concern over what might happen if IBM ever altered its operating systems so they couldn't be used on the Amdahl equipment may be unnecessary, the observers added.

VM/PE will be licensed to users of all currently announced Amdahl CPUs, including the recently introduced 470V/8 [CW, Oct. 23], for $1,500/mo for each installed 470 system. Amdahl is at 1250 E. Arques Ave., Sunnyvale, Calif.

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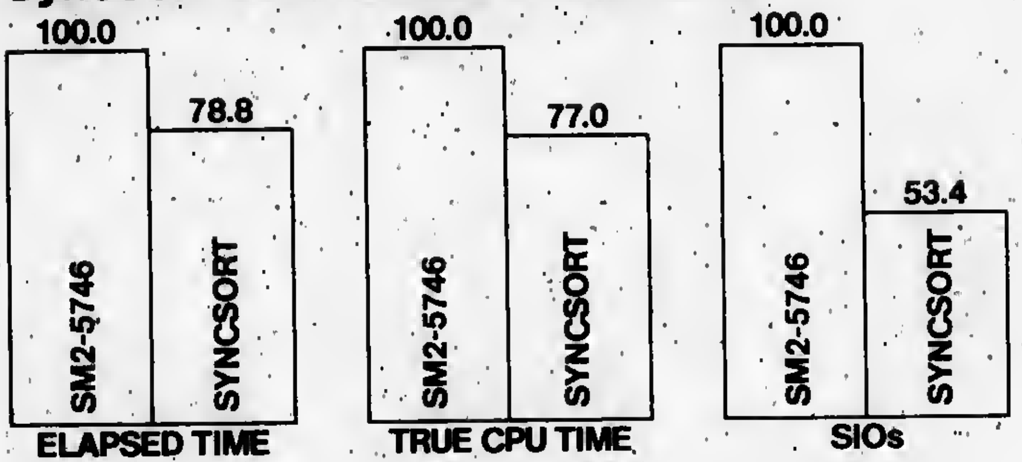
SyncSort DOS vs. IBM's SM2-5746.



But performance aside—if that's possible in a software program—better ask yourself another question before you say "I do" to any DOS sort. How will it fit in if you move up to OS/VS?

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SM2-5746, for example, has three called INCLUDE/OMIT, SUM and OUTREC. But no IBM OS sort has any one of those features.

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Seen Obsolete in 1980s

DP Grads Warned On Lack of Business Sense

By Tim Scannell
CW Staff

TORONTO — The graduates of data processing courses churned out each year by the universities here and in the U.S. may fit into the corporate mold today, but they will probably be obsolete in the 1980s.

Academe is so concerned with turning out armies of hardware and software "supertechnocrats" that a serious shortage of effective DP business managers has been developing, according to Robert Humfrey, a partner with Peat, Marwick and Partners of Toronto.

Humfrey was one of several people who spoke here last week at the three-day Canadian Computer Show and Conference. The sessions and show, sponsored by the Canadian Information Processing Society (Cips) along with *Canadian Datasystems* magazine, focused on people, data access and storage and computer systems.

CW In Canada

DP courses and educational programs should provide some groundwork in the business end of the DP profession as well as its technical aspects, Humfrey stated. DP graduates should have a "real-world exposure" to the business environment, including coping with management problems, understanding management processes and knowing how to implement financial and corporate operating controls.

Most companies mistakenly assume that tomorrow's managers will emerge savior-like out of their DP departments and fulfill all corporate expectations. But the companies don't realize that most of these chosen people do not have sufficient training in a business environment, Humfrey said.

The DP staff is usually too knowledgeable in hardware concepts and too ignorant about the world of feasibility studies, quantitative evaluations and computer audits, he explained. "As programming and computers become more commonplace," he added, "there will be an increased emphasis on management aspects and on ways to effectively use various hardware tools."

Colleges and universities could prevent the extinction of successful managers by placing "quantitatively and analytically minded" DP people in basic business applications, Humfrey believes. These applications include "on-the-road" sales, warehouse and clerical positions.

Unfortunately, most students want an immediate mathematics involvement with a corporation and miss out on basic business training, Humfrey noted. "Not to sufficiently train the DP professional is to throw away the profession and relegate it to the backroom," he pointed out.

Tackling the Problem

Randy Klawitter, a program administrator with the University of Waterloo's Department of Coordination and Placement, agreed with Humfrey's assessment of management's future, but added that a great many programs do exist that attempt to tackle the problem. The University of Waterloo, for instance, has a cooperative education program that incorporates work terms into the DP curriculum.

Students attend eight four-month academic terms — structured classroom lessons — and spend the rest of the four-year, eight-month program in a business environment, putting their knowledge to use.

Waterloo's co-op program is the second largest of its type in North America and boasts a 95% placement record. Students in the program are evaluated by both their employers and the university and, after graduation, are placed in jobs by a computerized "dating game" type of match-up.

Klawitter

Photos by T. Scannell
Humfrey

Employer's needs as well as student objectives are compared until a suitable match is made, Klawitter stated.

Students are required to rank each employer when they finish their six four-month work terms, which gives the university and future students an insight into corporate placement and business techniques.

University coordinators are appointed to act as student-employer liaisons, "guiding each toward a happy marriage or abrupt divorce if it serves the needs of both parties," Klawitter remarked.

Show Attracts Large Crowds

(Continued from Page 1)

Equipment displayed throughout the convention center ranged from simple home computers to sophisticated distributed data processing systems. Although the Canadians were genuinely interested in the various minicomputers and mainframesshown on the floor, a booth offering personal computer portraits seemed to attract the largest crowd — mostly of students.

A number of U.S.-affiliated firms demonstrated to the crowds products already introduced in the U.S. Data General Ltd. spotlighted its CS/20, CS/60 and Eclipse M/600 computer systems; Micos, Inc. presented its 32M-byte Micos 300 disk system; and Cincom Systems of Canada, Ltd. unveiled its Total Information System (TIS) software package.

Pertec Computer Corp. (PCC) and PCC Canada also exhibited double-head and double-density disk drives as well as the XL40 and XL20 distributed processing systems.

Users Blast U.S. for Lack Of Transborder Data Policy

(Continued from Page 1)

the charter to set information policy and to negotiate with foreign governments in this area," one speaker noted.

Even finding whom to talk to in government on these issues is a problem, they said. "You need to go on an archaeological expedition to find anyone who knows anything about it," one noted.

In addition, the group expressed its feeling that the Administration is unaware of the economic impacts of regulations in Europe.

The representatives were particularly critical of the National Telecommunications and Information Administration, which they feel has ignored the issue just as its director, Henry Geller, chose to ignore this conference by cancelling his plan to attend at the last minute.

Critical of Business

But while the group was particularly harsh on the Administration for a lack of action in the area, it also saved some criticism for U.S. business, which, it feels, does not fully appreciate the scope of the problem either.

"We all need to educate our top management" on the newly raised problems of restrictions on data flow, one member said.

The users agreed they should try to make top management in their firms aware of the problem and try to get management to take lobbying action through such business groups as the Business Roundtable.

"The U.S. is in a reacting mode today," one said, adding, however, that quick action needs to be taken before U.S. firms are restricted from doing business in certain countries.

The group seemed to agree that it would probably take some "really serious horror stories" before the U.S. government and major businesses would act, but members were worried that by then it might be too late to take any remedial action.

The group was particularly concerned about the amount of work going on in Europe that will affect their companies' ability to process and transmit data over national boundaries.

For example, the conference outlined the four existing European privacy laws (in Germany, France, Austria and Sweden) and the possible effect they might have in limiting the use and storage of information linked to individuals.

At the same time, the planned draft conventions in the works both at the Organization for Economic Cooperation and Development and the Council of Europe were outlined at the conference, where it was noted that both would probably recommend draft laws that would call for establishing data inspection boards by all countries agreeing to follow those laws.

While most of the caucus members agreed that they had seen few economic consequences from these laws to date, they indicated that in the future these laws could have a very limiting and restricting effect on the way they operate around the world.

"This is no longer just a policy issue," one of the users said. "It's now an operational issue."

But while these laws have been developed, restricting the actions of U.S. firms, the DPers here said they feel the government has let them down by not establishing policies in these areas.

Focusing on Employee Development Urged

By Tim Scannell
CW Staff

TORONTO — The DP community's quest for more hardware and software knowledge has not only resulted in an abnormally high turnover rate within the industry, but has also produced an underutilization of human resources at the management level.

"Blessed is he that knoweth the answer, for there is no answer," Douglas Whitney, an assistant vice-president with Manufacturer's Life Insurance Co. (Manulife), intoned.

Whitney, who deals with human resources development at Manulife, discussed DP careers and management objectives last week at the Canadian Computer Show and Conference here.

CW In Canada

A company seriously considering a management training plan of action should first establish certain criteria for management development, Whitney said. Standards or levels of performance should be set, and a formal evaluation of each employee's "end result" has to be incorporated into the company's system so that the DP department is aware of what goals to shoot for.

Stringent selection standards are important during recruiting to screen the initial applicant and to establish a primary level of quality, Whitney noted. Hiring practices should adhere to these qualifying standards without compromise until every available position is filled.

However, Whitney warned that what might be good one year is not necessarily good the next — in hiring practices or in employee development. Employees, particularly in the DP department, should be allowed a certain amount of mobility and organizational exposure.

There are, of course, a great number of problems associated with running a people-oriented shop. Concentrating on management development both within the DP department and on the outside will increase DP overhead costs, and shifting employees to maintain interest will eventually affect the operation of the DP system as a whole, Whitney explained.

An overly effective management program can also create problems if too much talent is siphoned from the same area, creating internal conflicts and pressures, he pointed out.

Morrison Hewitt, the DP director of the Toronto-based management consultants Woods Gordon and Co., stressed the "winning team philosophy" of internal organization and management. Employees are concerned with the stature and image of the DP department "and like to belong to a successful organization . . : not a losing team," Hewitt said. Data processing itself should be perceived as a means to achieve personal as well as company objectives.

Hewitt explained that a company's "set of plays" should include the appropriate tools in the development phase, such as documentation and equipment specifications and more than adequate hardware resources. The company should also try to eliminate laborious tasks and establish a productive environment where each person knows that his job, is important to the final result.

Contrary to popular belief, Hewitt said, "DP people don't react differently than people in other departments."

Basically, people in the DP department want their skills to be challenged and to complete an activity as a whole. Responsibility, relevance to the project and feedback on his efforts are also important to the employee's delicate morale.

Reinforcement and recognition are the employer's two greatest weapons against disinterest and eventual migration in the DP industry, Hewitt said.

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Postal Service Progressing on Electronic Mail

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Postal Service's plans to provide electronic mail service are progressing both domestically and internationally.

On the domestic scene, Postmaster General William F. Bolger will ask the board of governors of the U.S. Postal Service for the authority to begin a pilot program of the Postal Service's proposed Electronic Computer-Originated Mail (Ecom) service.

According to a Postal Service spokesman, Bolger will put forward a proposal for a 15-month "preliminary phase" of the Ecom system at a meeting of the board of governors in Houston tomorrow.

Bolger will ask for the temporary implementation of the Ecom plan because the Postal Rate Commission has not yet acted on the Postal Service's official request for authorization, according to postal official Robert A. Becker.

Becker explained that under the Postal Reorganization Act, if the rate commission does not decide on a proposed new service within 90 days, the Postal Service may begin the service on a temporary basis after 10 days' notice.

The Postal Service originally filed its request Sept. 8 for authorization to offer Ecom. It does not appear, Becker said, that the rate commission will decide on Ecom within that three-month period, which ends this week.

He said the Postal Service already has at least 25 post offices "strategically located" that are equipped to handle the electronic mail service, a joint venture with Western Union [CW, Sept. 25]. The post offices would make use of terminals already in place for the Mailgram service offered by Western Union.

In addition, Becker said, the Postal Service already has at least five companies lined up for Ecom service. The five are among approximately 750 companies the Postal Service has identified as having sufficient mail volume to economically justify Ecom use.

By the end of the first 15 months of the proposed "preliminary phase," the Postal Service hopes to have about 60 companies using Ecom, Becker said.

On the international level, the Postal Service recently announced a contract award of $88,550 to ITT World Communications, Inc. for international telecommunications circuitry for the Postal Service's international Electronic Post (Intelpost) system.

Under the contract, ITT Worldcom will provide the communications channels for transmitting data via satellites between the U.S. and Argentina, Belgium, the Federal Republic of Germany, France, Iran, the Netherlands and the U.K.

The Postal Service announced plans for Intelpost in March. The satellite communications system will provide high-speed transmission of facsimile copies of letters and other documents.

The program is being conducted with the technical and planning assistance of Communications Satellite Corp. (Comsat) [CW, Sept. 25].

ITT Worldcom will install communications circuits, varying in speed from 9.6K to 50K bit/sec between the U.S. and the seven participating countries, the Postal Service said. The Postal Service headquarters building here and the World Trade Center in New York City will serve as U.S. service centers for Intelpost. Transmission centers will also be set up in the other countries.

Intelpost, scheduled for initial testing next March, will utilize high-speed dedicated circuits provided by an international record carrier, high-speed digital facsimile equipment for scanning and printing and minicomputers for store-and-forward functions.

Comsat has been authorized to acquire Rapicom Superfax-500T and 500R scanners and printers for installation at the New York and Washington service centers, the Postal Service said; and similar equipment will be used in the other countries.

The Rapicom equipment is described as being capable of scan/print times of six seconds per page and resolution of 200 lines per inch. The minis will be Digital Equipment Corp. PDP-11/34s.

STSC to Offer In-House APL Support

(Continued from Page 1)

counterparts, he added.

While the Quad 100 is clearly different from the IBM 8100-class mini introduced by General Electric Co. this week (see accompanying story), the introduction of both hardware and software by these two remote computing services vendors continues a trend started earlier this year with announcements from Automatic Data Processing, Inc., Keydata Corp. and National CSS, Inc.

Although STSC has said first customer shipment of the Quad 100 is expected in the first quarter of 1979, the spokesman also said no decision had been made yet on which of several hardware vendors will provide the units.

But, he argued, the decision itself is virtually immaterial since STSC will be offering the "mini" as its product, with full support. The user "shouldn't have to care who built the box," he said.

All the hardware vendors now being considered are viable alternatives with equipment that can meet that delivery schedule, he said, adding that the user needn't be worried about specifics because all of the systems being evaluated are in the "138/148 class, and that's what's important."

Being in that class means the Quad 100 will be a machine with at least 1M bytes of memory and five channels. "Most of the candidate machines meet those specifications and are expandable to 16 channels," he noted.

STSC sees the Quad 100 as particularly useful at universities where a lot of work is appropriate for handling with APL but the institutions are generally unwilling to spend much money on outside time-sharing, the spokesman said. On the other hand, a number of commercial firms have also shown an interest in the product, he added.

In addition to running on the Quad 100 and on STSC's own network, APL-Plus will be available to users with IBM or compatible mainframes, where it can be used under OS/MVT or in a "virtual machine" directly under IBM's Virtual Machine facility (VM/370). Running in VM "native mode" means users can avoid one of the layers of overhead that is required in IBM's APL environment, the spokesman said.

The STSC system is said to be much faster than IBM's, including internal enhancements to speed up the handling of various "combination characters," for example, that perform table lookups. Administrative software — "dump restore, accounting, backup . . . everything it takes to run a data center" — is also part of the package, according to STSC.

A report print formatting facility and a comprehensive file system — "far better than IBM's, which lets you use CMS files" — are also included in APL-Plus. So are the Automatic Control of Execution (ACE) facilities introduced by STSC last summer [CW, Aug. 28] to simplify the users' interface with the APL system, the spokesman added.

The VSAPL enhancements "begin with formatting and file management" and include various other features designed to run under the control of IBM's VM/370 as an interactive processor, he said.

STSC's experience in developing systems for corporate financial management is reflected in the two application programs the company is releasing for in-house use. Both the Financial Planning System (FPS) and the Comprehensive Manufacturing Control System (CMCS) were written in APL, but that is transparent to users, the spokesman stressed.

FPS can be used for both financial planning and modeling, he said, adding that it is "particularly adaptable" to multidivisional and diversified corporation planning environments. CMCS is intended to assist large, discrete manufacturers in shop floor control, forecasting and material requirements planning (MRP) operations.

Unable to provide specific details on how much each offering may cost users, the spokesman explained STSC felt it had to release news of its plans now, even though they are still incomplete, because stock for the company is publicly traded.

He noted, however, that the Quad 100 will "probably be in the $500,000 to $1 million range," with specific cost depending on the model and options selected.

The APL-Plus software, as a separate package, will "probably" cost "in the neighborhood of $100,000" with "some sort of usage surcharge" on top of that front-end charge. A lot of the $100,000 will be earmarked for installation help, he emphasized.

CMCS will also cost $100,000 or more, up to $500,000, depending on features included and the amount of customization effort STSC has to put into the implementation. FPS as a package still has not been priced.

STSC is headquartered at 7316 Wisconsin Ave., Bethesda, Md. 20014.

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Vendor Gives Up on Debugging

System Removed From Princeton Library

By Marguerite Zientara
CW Staff

PRINCETON, N.J. — After two years of field-testing a bug-ridden book inventory control system, Princeton University's library has now gone to a manual file system — 3- by 5-inch cards — as an interim measure until a replacement computerized system can be selected.

Princeton, along with the Arlington, Va., County Public Library, was used as a test site for two years for the 3M Co.'s Library Inventory Control System (ICS) at no charge for either hardware or software. Based on Universal Product Code (UPC) labels, the system was designed to link a patron's name with a book number in a light pen charge-out operation and later to break that link when the item was returned. It also was to have kept cumulative records of fines, bills issued and bills paid by each patron of the library.

In spite of the system's intended functions, however, it was not fully designed and tested at the time of its installation at Princeton, according to Abigail Dahl-Hansen, associate librarian at the university. The system's problems manifested themselves in "crashes," sometimes as often as 50 or 60 times in an 8 a.m.-to-midnight day, she said.

With an average of almost four crashes per hour on bad days, smooth operation of library functions became difficult. In addition, because of library personnel unsophisticated in data processing, as well as unsophisticated message output by the system, system crashes were not always recognized immediately, Dahl-Hansen said.

Once the problem was acknowledged, however, bringing the system back up was simply a matter of "pressing a restart button," she said. But with 2 million books to keep track and more than 6,000 patrons using the library, Princeton could not afford inventory control problems.

'Software Looping'

According to a 3M technician who worked closely with Princeton but has since moved to another division within the company, the problem boiled down to "software looping." By January 1978, the spokesman claimed, the system was at an acceptable level of operation, with an average of two "loops" — crashes — per day.

According to the technician, Princeton circulated its first book on the system in January 1977. There was "some file degradation" during the first six months of operation, he said, but it was cured by the ninth month.

In September 1977, Princeton added its reserve books section to the computerized system, doubling system throughput. "When you have a test site and then double your throughput, you have to expect more bugs to come out of the cracks," the technician said. There were indeed more "bugs," but by last January the system was operating with an average of two crashes per day, a level he considered acceptable.

Nevertheless, at the end of February, 3M Library Systems Manager Dr. Graham Gurr announced 3M was giving up on ICS. "The advanced systems of ICS make it higher priced than competing systems," Gurr said at the time, adding that the limited market for "such an advanced system" didn't warrant 3M's continuation in the business.

The firm did not withdraw entirely from the library market, however, and continues to offer its library terminals to "circulation system builders," according to a spokeswoman.

'New' Manual System

The first week in June saw the removal of the hardware from Princeton's library after the judicious printing of labels to be pasted on 3- by 5-inch cards for the "new" manual system.

So, with two years of computerization behind it, Princeton's library spent "several months" reconverting to a manual system, according to circulation librarian James Cogswell.

"It meant a lot of hours spent pasting those silly labels onto 3-by-5 cards," Cogswell recalled.

Things at Princeton are now running "slowly by smoothly," he added, although things were "frenetic" and "chaotic" during the conversion process. "We've had to add temporary personnel to do essentially nothing but file 3-by-5 cards," he said.

Princeton's 3M system had consisted of a Data General Corp. Nova 312 minicomputer with 48K bytes of 16-bit words. A Control Data Corp. Model 9762 disk drive was configured for 80M-byte disk packs, although the system's two disk packs were formatted with 66M bytes each.

The system also included six 3M-manufactured on-line keyboard terminals and six 3M Charger light-pen terminals, according to a 3M spokesman. The system utilized a Systems Industries, Inc. controller and operated under the KRDOS operating system.

The Arlington County Public Library used the same configuration for conversion only and therefore was not in as critical a stage as the circulation system, the 3M spokesman said. The firm removed Arlington's test system at the end of September.

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Victory Goes to Warner

By Tim Scannell
CW Staff

RICHMOND, Va. — Three weeks after a malfunctioning computer unofficially declared John Warner the winner of the U.S. Senate race here, the Virginia Board of Elections' official canvass showed him to be the actual winner over Democrat Andrew Miller in what has turned out to be the closest general election in recent state history.

Warner defeated Miller by exactly 4,721 votes — or .4% of the more than 1.2 million votes cast in the Nov. 7 election, according to last week's canvass. The unofficial returns, processed by the News Election Service (NES) in New York, had shown Miller losing to Warner by less than .3%, or 5,190 votes.

Problems with the NES computer on election night began when the system started listing more voting precincts than the state actually has. The computer was also plagued with numerous downs and delays, which subsequently caused problems with election returns across the country [CW, Nov. 13].

In addition, several problems with the counting of absentee ballots were caused by various precincts that submitted these returns on election night and others that processed them separately.

Miller has still declined to concede defeat, labeling himself an "apparent loser," and has until Dec. 7 under Virginia election laws to demand a precinct-by-precinct recount. Recounts are reportedly allowed in Virginia when the vote count puts one candidate less than 1% behind another.

In the event of a recount, the loser would have to pay its cost, which is estimated to be a minimum of $120,000 in this race.

Meanwhile, Warner has accepted his victory and is prepared to represent the state in Congress.

DP-Aided Search Results In Arrest for Hit-and-Run

By Tim Scannell
CW Staff

BOSTON — Following a massive 300-man, computer-assisted investigation, Metropolitan District Commission (MDC) police here arrested a suspect in connection with a recent hit-and-run accident that seriously injured MDC patrolman Harold MacGilvray.

Douglas Peterson was arrested at his home in Weymouth, Mass., and charged with operating a motor vehicle under the influence, operating to endanger, driving with a suspended license and leaving the scene of an accident after causing personal injury.

Peterson admitted operating the hit-and-run vehicle at least two hours before the incident occurred, but claimed he did not remember being involved in the early-morning accident.

The investigation closed in on the suspect after MDC detectives pieced together Peterson's actions before, during and after the accident, placing him at the scene of the crime.

"We traced his movements from 11 p.m. Sunday and into Monday morning," according to Lt. Det. Thomas Keough, who spearheaded the investigation.

MacGilvray was struck three weeks ago, by a speeding car and seriously injured as he was questioning another driver in the breakdown lane of Boston's Southeast Expressway [CW, Nov. 27].

MDC police located the hit-and-run car by pouring through stacks of computer printouts listing more than 16,000 automobiles that matched a description provided by an eyewitness at the accident scene. After eliminating approximatley 10,000 possibilities, more than 300 MDC policemen worked around the clock to locate every remaining car on the list until the guilty vehicle was found.

MDC detectives will reportedly continue their investigation to determine if MacGilvray was intentionally hit or struck as the car swerved to avoid the vehicle stopped in the expressway's breakdown lane.

GE Adds Marklink System

(Continued from Page 1)

upwardly compatible with F77 with the addition of data base and communications enhancements and, while it can be used with simple terminals, it was specifically designed for use with the Marklink miniprocessors, GE said.

The software allows prompting, editing and data base updates with full concurrency, consistency and recovery capabilities, GE said. It interfaces with multistream communications through an interactive host application that recognizes attachments of new data streams, individual messages and line breaks.

In addition, the host center recognizes each mini on the system for remote diagnostics and service recording.

The minis will be tied into a host center through the GE teleprocessing network. They will use a protocol said to be compatible with the CCITT X.25 packet protocol at the electrical and packet level but extended to handle dial-up as well as leased-line communications.

Error-detection routines are built into the system and message acknowledgment, including application-to-application message acknowledgment, is provided.

The circuits used for multistream or packet communications are 2400 bit/sec, GE added, noting that the IBM 3780 protocol is also supported on the system.

In addition to hooking into the GE network, the mini can also communicate with a firm's in-house computer system, GE said.

Each unit in the overall scheme is priced separately, with the mini, telecommunications links and host processing each carrying its own price tag.

A minimum minicomputer configuration including 64K bytes of main memory, one CRT and one floppy disk drive will rent for $800/mo on a two-year lease and sell for $21,230. A maximum configuration with 352K bytes, 16 terminals and 20M bytes of floppy storage will rent for $3,690/mo and sell for $93,290.

Dial-up communications is available at a flat rate of $25/hour. Leased lines are available for $825/mo if the using location is within 50 miles of a GE network node and $1,490/mo if located farther from one of the 600 nodes in the network.

Host processing services are priced according to the amount of storage and processing required. However, Sims indicated that for $15,500/mo, a user would receive enough storage and processing for a network with 10 remote sites used to perform order entry.

Users will be quoted a fixed price for such applications, he added.

GE's Information Services Division is headquartered at 401 N. Washington St., Rockville, Md. 20850.

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Cbema Seeks Split of Its Ansi, Industry Roles

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Computer and Business Equipment Manufacturers Association (Cbema) said recently its role as secretariat for U.S. DP and office equipment standards committees will be separated from its own internal standards program.

The association headquartered here, has served as the secretariat for the American National Standards committees X3 (computers and information processing) and X4 (office machines and supplies) since they were formed by the American National Standards Institute (Ansi) in 1961.

Cbema will finance and staff the two secretariats, which perform all the administrative functions for the two standards committees, for at least the next year, according to Catherine A. Kucharik, who will manage the X3 secretariat. However, the association is considering eventually divorcing itself entirely from the two secretariats, she said.

The first step, the separation of Cbema's own standards program from the association's support of the secretariats, will allow the association to determine the costs of the two programs, she explained. Currently the secretariats and Cbema's internal standards program are budgeted together, with the cost of the two programs set at $192,000 for the next year.

The association's Standards Program Management Committee is working on a study, to be completed by next June, to determine what additional steps — if any — should be taken to further dissociate Cbema from administration of the standards committees.

Oliver R. Smoot, Cbema's vice-president, stressed that "the one option we are not contemplating is abandoning the secretariat function without an assured continuity in the [committees'] activities." Cbema is looking for an "acceptable alternative secretariat" to recommend to Ansi, he said.

Ansi determines the procedures for U.S. standards committees and is the U.S. representative to the International Standards Organization, headquartered in Geneva, Switzerland.

Smoot noted Ansi is studying the possibility of establishing a professional secretariat function of its own which would "provide a definite alternative" to Cbema and organizations that function as secretariats for other standards committees.

Despite the Cbema decision to separate its standards roles, the association will not become a member of the X3 or X4 committees, Kucharik said. Cbema believes it is adequately represented on the committees by its member companies that are also members of the two standards committees.

Confusion About Role

Cbema has operated the two secretariats since the inception of the X3 and X4 committees in 1961. "The members of the association felt that they would be best able to contribute and guide" the committees, Kucharik said, explaining the origin of Cbema's secretariat role.

But the secretariats are a drain on the association's resources, she noted, and the manufacturing community has been somewhat confused about Cbema's role in standards making.

"Some people don't realize Cbema exists," she said, and some do not understand Cbema's relationship to Ansi. Cbema provides only the administrative functions for the X3 and X4 committees; "We don't provide the technical expertise."

Conversely, Cbema staff members whose work is related to the association's role as secretariat for the two committees "remain impartial" and are not influenced by any standards activities on the part of the association itself, she said.

The separation of the two roles in standards "is going to alleviate confusion," she predicted. "I think it's going to focus the actual secretariat duties in one spot."

Educom to Study Resource Sharing In Academe

PRINCETON, N.J. — Educom has been awarded a $362,000 National Science Foundation (NSF) grant for a 20-month study aimed at identifying and understanding the major factors associated with computer-based resource sharing in academic research and teaching.

Educom is a nonprofit educational corporation that promotes the most effective use of computing and other technologies in higher education.

The study will examine nine established organizations that actively facilitate computer-based resource sharing and three discipline groups that use such resources, according to Educom President James C. Emery, who is principal investigator for the project.

Factors that facilitate sharing and barriers that impede it will be identified, and the impact of sharing on research and education will be assessed.

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The second book, *The Structured Programming Cookbook*, is a reference book. It will help a programmer apply his training while on the job. It gives complete standards and guidelines for program development so a programmer can easily review the principles of the text for each phase of program development. It also gives complete design, documentation, and coding for four typical business programs. By using these programs as models for new program development, a programmer can avoid program reinvention.

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Kentucky Druggists Phone in Medicaid Claims

By Marguerite Zientara
CW Staff

FRANKFORT, Ky. — In what it considers a breakthrough step toward a paperless society, the Kentucky Department for Human Resources (DHR) here has undertaken a pilot project allowing pharmacists throughout the state to input Medicaid claims directly to its computer via telephone.

The Pharmacy Telephone Transmission System, in operation since September, involves 10 volunteer pharmacies in Kentucky. The state normally receives about 290,000 Medicaid claims per month from 870 pharmacies.

To access the system, a pharmacist calls a toll-free number that connects him directly with the department's CPU. He is then instructed by voice response to enter his claims information, which is done on a push-button phone. If a user does not have a push-button model, the DHR furnishes him with an adapter pad.

Necessary Information

Data elements include the pharmacist's "provider number" — ID — as well as a personal identifying code. The pharmacist also inputs the drug's identifying number and a recipient ID number comprised of the Social Security number (SSN) and a check digit that confirms the SSN's accuracy. Other information includes the quantity of drug dispensed, the date on which the prescription is filled, the prescription number and the billing amount.

If a physician has requested a specific drug rather than its generic equivalent, the pharmacist must input a "physician override" code as well.

If an error is made in entry, such as giving the recipient ID number the wrong number of digits, a verbal error message will be relayed to the pharmacist over the phone.

When all information has been entered correctly, a number is assigned to each transaction. "That way, when the pharmacist gets his payment from the Medicaid program, he can go back and check the transaction numbers to make sure he was paid for each transaction he put into the system," a DHR spokesman explained.

Claims information can be input from 8 a.m. to midnight to a 36K-byte IBM System/7 that was acquired specifically for this program. It is then transferred to DHR's dual IBM 370/168s. The 370s are channel-connected to the System/7 and have 16M bytes of core memory.

Accuracy Checks

Twice a week a payment program is run against the DHR's central data base to assure the accuracy of claims information. This program validates all the data elements that have been input to the system since the previous check. For example, it matches all the provider numbers against a file of all pharmacists who have been approved to participate in the program, the spokesman noted.

It also checks recipient ID numbers against the recipient eligibility file to make sure each recipient was eligible for Medicaid on the date the drug was dispensed. In addition, the payment program determines whether a duplicate claim has been filed within one payment run.

Using an algorithm, the program then calculates the payment amount due for each prescription and issues checks to the appropriate pharmacies. Checks are printed on an IBM 1403 printer.

Better Than Scanning

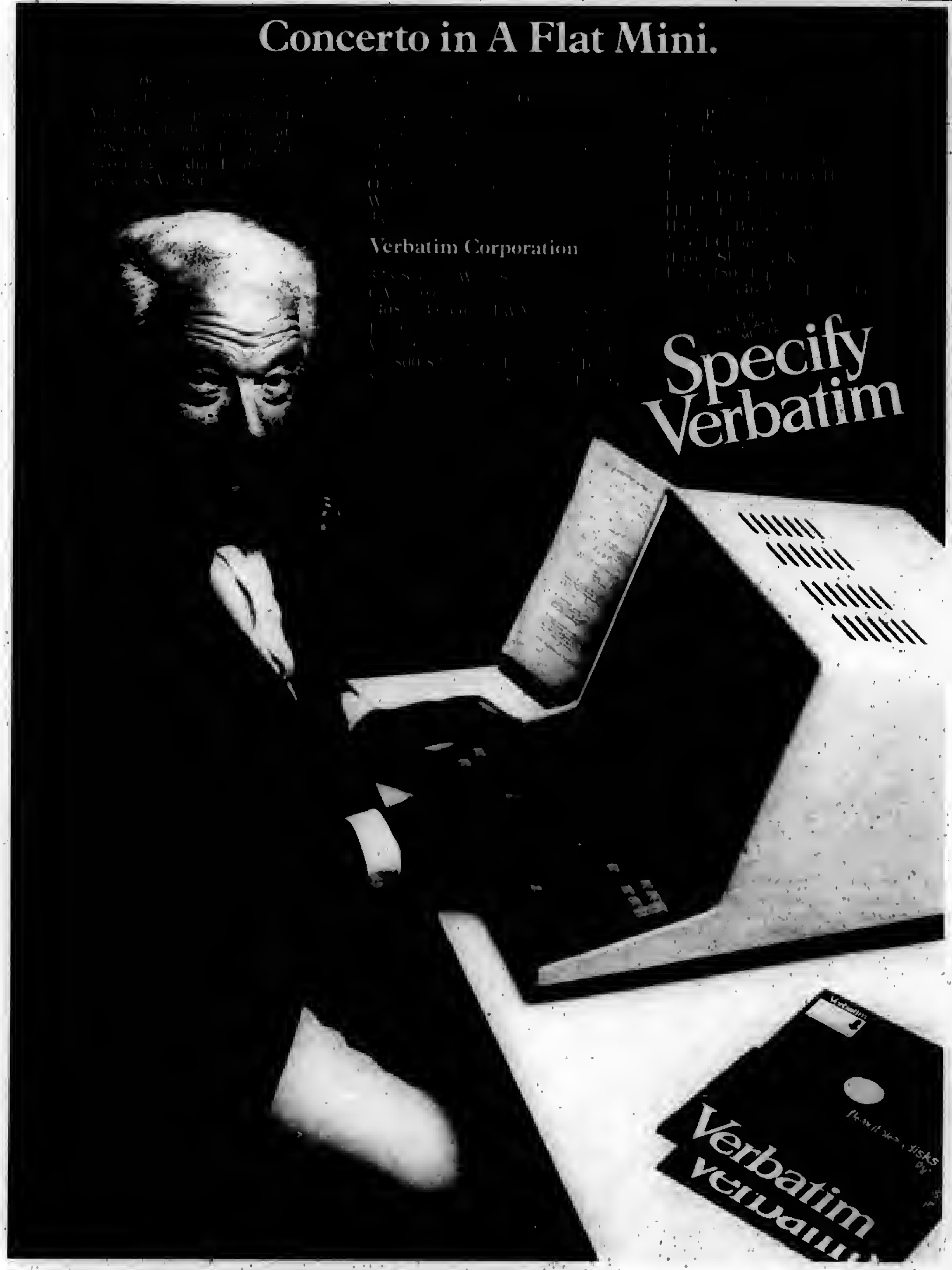
Before the pilot program, pharmacists submitted claims for processing either on magnetic tape to service bureaus or directly to the department's IBM 1288 optical scanner. The 1288 produced a tape that was input to the 370's data base. That method is still offered as an option.

"The new system appears to have a good advantage over the submission of optical scanning sheets, because with the latter you have to be very careful how you fill out the sheets," the spokesman said. "It appears the data coming in through the new system is of better quality since people don't have to be so careful in transcribing the information."

The system was evaluated at the end of November on the basis of time and money saved as well as qualitative factors, such as whether pharmacists think it is a better system than the earlier one, the spokesman said.

If results show that the system was successful, it will be offered as an option to the 870 pharmacies presently participating in the Medicaid program.

The system has been "extremely well accepted by the pharmacists who have used it," according to Frank Gormley, systems support manager for the DHR's Division of Management Systems. In fact, an unanticipated high usage of the system necessitated enlarging memory storage areas.



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Good Picture of DP Market?

DP Vendors' Depositions at Issue in IBM Trial

By Connie Winkler
CW Staff

NEW YORK — Stooping under the weight of the eight fat volumes he was lugging and grinning with all the attention he was getting, IBM counsel Ronald S. Rolfe plopped the deposition in front of the witness.

Each volume was at least as thick as a ream of paper — and this was only one of 624 depositions from DP vendors which have been admitted in the U.S. vs. IBM antitrust trial here.

Rolfe was not the only one who had difficulty handling the depositions, which now fill 13 four-drawer file cabinets and numerous cardboard boxes in the courtroom. The U.S. Justice Department filed numerous objections to 109 of the 624 depositions and spent a full day in court objecting to the first handful.

As negotiations evolved, the government finally allowed all 624 to be introduced as evidence — with one major reservation. The government reserved its motion to strike the depositions if IBM does not provide an adequate foundation for them in the course of the trial.

When the compromise on the depositions was made, government lead lawyer Robert J. Staal called it a "legal maneuver." Such a motion to strike would probably come at the end of the case, Staal said.

Basically, IBM has maintained that the depositions give a good picture of the DP market. The government says the depositions are like trying to add apples, oranges, pears and baseball bats. No definition of "DP" has been included in many of the depositions, nor has any foundation been laid showing that they measure a valid market, the government contends.

IBM had a legal duty to define DP products and services at the time the depositions were taken, according to the government.

Key to Defense

The depositions are key to IBM's ability to show it does not have a monopoly share of the DP market. A deposition is a written statement taken under subpoena in the presence of both parties.

In this case, 811 firms were asked to supply DP revenues, and that list was later pared to 624 by IBM. The firms range from AT&T to one firm that reported oceanographic equipment among its DP revenues. In the chambers of Judge David N. Edelstein, government counsel objected that there was no basis for selecting deposed companies nor was there any basis by which the reported revenues could be added. Further, the government argued, there is no evidence the DP market as measured by IBM is a relevant market concept for the court.

IBM will call about seven economic witnesses who will define DP, and under none of these definitions will IBM be shown to have a monopoly share, Rolfe said.

IBM also argued that the depostions are relevant measures of the DP market and are the best information that could be obtained. Findings from these same depositions were accepted in the Memorex vs. IBM jury trial, IBM counsel pointed out.

Again in U.S. vs. IBM, IBM is expected to compare its own revenues to a total compiled from the depositions. IBM's pretrial brief says "IBM's share of the domestic DP revenues of the more than 700 companies deposed in connection with the parties' joint census declined from 55% in 1957 to 32% in 1972."

The first part of the comparison was put in place last month when IBM Controller C. Arthur Northrop presented IBM's DP revenues for 1952-1972. The second part was placed by the IBM witness on the stand last week, Raymond J. Dubrowski. Dubrowski is a partner of Price, Waterhouse & Co., which undertook the three-year, $5 million job of tallying all the revenues reported in the depositions.

No Better Way

A certified public accountant who has been with Price, Waterhouse 25 years, Dubrowski said he could think of no better way to compile such statistics. "All the material came to me as a result of sworn statements under court order and subject to examination by attorneys," he said. "I couldn't see where better information could have been obtained."

On cross-examination, government counsel Alan Nisselson drew out of Dubrowski that:

- The special audit done for IBM's law firm was unlike a financial audit; and there were no additional checks on the information supplied.
- IBM determined which products and services were DP. If Dubrowski had questions, as he did with 14 of the statements, he conferred with experts recommended by IBM counsel.
- Price, Waterhouse does general auditing for IBM annually and bills between $1 million and $2 million.

Nisselson also picked through specific depositions showing that, in some cases, foreign-manufactured products, research work and products totally unrelated to DP were counted in DP revenues.

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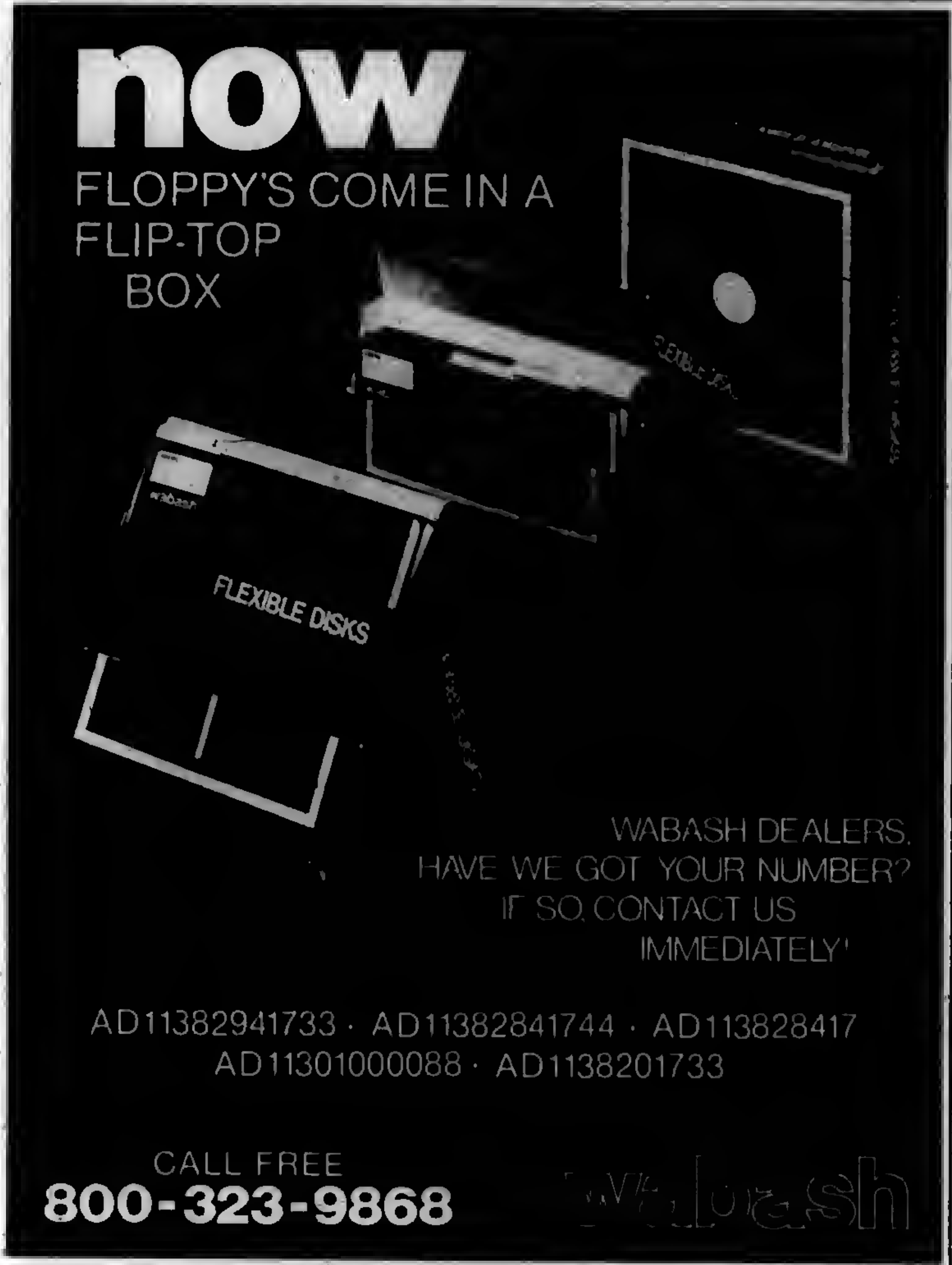

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Postal Service Compliance With Privacy Act Uneven, Internal Audit Contends

By Jack Kirchner
CW Washington Bureau

WASHINGTON, D.C. — An internal audit has found uneven compliance with the Privacy Act and inadequate security procedures for records systems at U.S. Postal Service headquarters here.

Although the Privacy Act has been implemented by the Postal Service "for the most part," there are areas that "still require attention," according to the recently completed audit report prepared by the post office's Special Investigations Division.

The major problem area is records systems, which "are not given adequate security. A uniform set of security standards has not been developed under which the Postal Service can operate."

In addition, "security guidelines that have been issued are not being enforced by the supervisors," the audit found. This has left the Postal Service "open to possible civil suit. The Postal Service could be compromised by information being released without authorization or prematurely."

Examples of Violations

Citing examples of Privacy Act violations and security breakdowns uncovered during the audit, the report described one case in which a Postal Service department "allowed an unauthorized person who is familiar with the department's computer system access to the computer on Saturday." During that time "he had access to all the information stored on the computer."

Furthermore, "throughout Postal Service headquarters, files from systems of records are left on top of desks, stacked on the floor and in unlocked equipment," the audit found. "This information is accessible to any person presenting an employee building pass during nonworking hours."

The Special Investigations Division recommended that a uniform set of security standards be developed for the records systems. Postal Service management, however, said it sees the problem as one of enforcing existing standards rather than issuing more detailed ones.

Principal Findings

The audit, conducted from June 1977 through January 1978, reviewed internal controls, training, adherence to regulations and cost factors involved in implementing the 1974 Privacy Act. Some of the audit's principal findings were:

- The current Privacy Act compliance staff "may not be sufficient to keep abreast of the assigned worklaod." The records officer "has done a commendable job in resolving emergency situations," but the smallness of his staff "has resulted in deferring projects that are necessary to meet the criteria set forth in the Privacy Act."
- The Postal Service has not made a commitment to educate employees concerning their duties under the Privacy Act. "Training being provided to employees does not adequately prepare them to comply with the Privacy Act while working with systems of records," according to the audit report.
- Individuals who are asked to supply information about themselves are not being adequately informed of their rights under the Privacy Act. This, too, was attributed to a lack of adequate employee training.
- There is no adequate, uniform system for recording disclosures of personal information.
- New systems of records are created or old ones are modified without proper notice being given to the records officer. "This is caused by lack of awareness on the part of headquarters employees concerning the requirements of the Privacy Act," the report noted.
- The Postal Service is not answering Privacy Act appeals "in a timely manner."

After calling for tighter management control and better employee training, the audit report concluded, however, "the records reviewed during this audit did not show the Postal Service to be in open violation of the intent of the Privacy Act.

"The thing that did stand out was the fact that neither the information systems executive nor the custodians of most systems of records had done anything to ensure accuracy, relevance, timeliness and completeness" as mandated by the Privacy Act.

Manual to Detail How to Uncover Computer Crime

MADISON, Wis. — *Assets Protection*, a security and investigation journal based here, this February will publish a "Computer Crime Investigation Manual" to assist prosecution of computer crime.

The "investigator's working resource" will focus on "how professional investigators have conducted actual investigations into computer crimes — not on textbook theory," the publisher explained.

The manual will also canvass the various ways in which computer crimes are discovered and their perpetrators brought to trial, including investigative auditing, evidence gathering and courtroom presentations.

Presenting Evidence

The manual will catalog forensic techniques for analyzing documentary and magnetic media evidence and discuss methods of evidence handling. There will also be a chapter on "how to successfully present credible evidence in court, as an expert witness or investigator, in ways that a jury unfamiliar with computers can comprehend."

An update service is planned to provide purchasers of the manual with additional or revised materials.

The manual will cost $100 after Feb. 1, but it is being offered through January at a prepublication price of $75. The update service fee is $50 annually, *Assets Protection* said from P.O. Box 5327, Madison, Wis. 53706.

Washington Update

Eight States Get Funding for Education Data

By **Jake Kirchner**
CW Washington Bureau

WASHINGTON, D.C. — The National Center for Education Statistics of the Department of Health, Education and Welfare has awarded eight grants totaling $407,726 to state education agencies to improve their long-term capabilities to collect, process, analyze or report statistical data about education.

The activities supported through the grants will include combining various components of education data (financial, students and staff, for example) into one integrated data base and upgrading DP expertise, related software and equipment.

The eight states that received grants were Arizona, California, Georgia, Illinois,. Missouri, Montana, Nebraska and Nevada.

Babione to Make Acquisition Policy

Dale R. Babione, former deputy assistant secretary of the Defense Department, has been named assistant administrator for acquisition policy at the General Services Administration (GSA).

The Office of Acquisition Policy (OAP) was established in September to tighten up "decentralized and loosely coordinated" GSA procurement practices, according to GSA Administrator Jay Solomon.

Babione's office will be the GSA's primary point of contact with the Office of Federal Procurement Policy in the Office of Management and Budget.

Babione's office will have four major directorates:

- Acquisitions Policy, headed by Bertrand G. Berube, former director of projects management in the GSA's Public Building Service.
- Contractor Clearance, headed by Harold Scheller, former head of contract clearance for the Defense Department's Logistics Agency.
- Planning and Acquisition Review, headed by Peter Kayafus, previously with the U.S. Air Force Systems Command.
- Federal Procurement Regulations, headed by Philip J. Read, former head of the GSA's federal procurement regulations staff.

The APO will be the focal point in GSA for, among other things, developing and implementing acquisition policies, regulations, systems, procedures and practices; approving preaward contract clearances; establsihing major GSA acquisition goals and objectives; and administering federal procurement regulations.

OTA Picks Barney To Head Division

Dr. Gerald O. Barney has been appointed assistant director of the Office of Technology Assessment (OTA) to head its Science, Information and Transportation Division.

A physicist with the Rockefeller Brothers Fund, Barney is currently heading a study for the President's Council on Environmental Quality. He will join OTA on Jan. 1, after completing that assignments.

The OTA division Barney will head undertakes assessments for Congress on R&D policies and priorities, telecommunications, national information systems, space applications, transportation and certain environmental issues.

Emergency Plan Set For Communications

The Defense Civil Preparedness Agency (DCPA) has announced a program to create an Emergency Satellite Communications System (ESCS) to provide quick communications in times of major disaster.

"The new system would apply modern satellite technology to solving problems arising from destruction or lack of conventional communications after a disaster occurs," the DCPA explained.

Under the program, transportable ground stations with voice, data and television capabilities would be flown or trucked into a disaster area to establish communications via satellite.

The emergency system will consist of a satellite link covering all 50 states, Puerto Rico and the Virgin Islands; a network operations control center in Washington, D.C.; 62 leased, fixed ground terminals with multiple voice, data and television capabilities; and 62 leased, portable earth stations with a single-channel voice or data capability.

The fixed and portable terminals will be distributed to the capitals of each state, Puerto Rico, the Virgin Islands and 10 regional federal offices.

Because the communications technology already exists, the system can be set up at a "modest cost," estimated at about $4 million a year for the first five years, DCPA said. The ESCS is expected to go into service sometime in 1980 or 1981 under the control of the Federal Emergency Management Agency, which is to be established early next year.

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'Slot Machine' Pays Off for Language Students

By **Ann Dooley**
CW Staff

CAMBRIDGE, Mass. — A new kind of slot machine has been paying off big — but in terms of foreign language learning, not money. The Sound-Synchronized Learner-Operated Teaching Machine (Slot Machine) has recently been developed to employ a mixture of synchronized text and sound as well as animated cartoon graphics to help the student learn more quickly and easily.

The teaching aid was developed at MIT's Architecture Machine Group by Brian and Eva Schwartz, a husband-wife team, while the couple was on leave from positions in Israel. They now live in Baltimore, where he is a systems engineer with Data General Corp. and she, a linguistics expert, is employed by the Baltimore school system.

The system uses both raster-scan color graphics and a random-access sound library under the control of two Interdata Model 7/32 minicomputers and can permit user interaction with the audio-visual material, according to Brian Schwartz.

Hebrew and Russian

The Slot Machine has been programmed to instruct students in either Hebrew or Russian. These two languages were selected because of Eva Schwartz's familiarity with them and because they demonstrate the full capability of the system.

Programming those two languages was no more difficult than it would have been with any others, according to Brian Schwartz, who noted that the most difficult part was working with the character sets that make up the Russian and Hebrew alphabet. The sets had to be defined and then input using an interactive system. The characters were put together by compiling dots in an 8 by 10 dot matrix.

Words can be shown in either left-to-right or right-to-left sequence, depending on the language, Schwartz said.

Words are presently translated into English but the system can be used to translate any language into any other, according to the developers.

To operate the system, a student sits at a Ramtek Corp. Model 9300 raster-scan terminal and uses a movable device that contains a special response button and controls an electronic pointer on the CRT screen. The pointer's screen position along with pushes on the button indicate commands to be carried out for instructions such as "repeat sentence," "translate word," "translate sentence," "repeat word," and "proceed on to a new frame."

Each new frame begins with an audio-visual presentation of a sentence, after which the student is allowed to work with the sentence, words and picture image on the screen. The sentence describes the picture either in Hebrew or Russian.

The words of the sentence appear and are heard syllable by syllable, and the student can make the system repeat the sentence or specific words as often as he likes. Each time, sound and text images are exactly synchronized and access is almost immediate, according to Schwartz. The student can have the word or sentence repeated by either pointing to it on the screen or by pressing the control button.

Using either method, the student can also indicate a word or sentence he wants translated, and the English equivalent will immediately appear for any of the objects or words on the screen. In this way, he builds up associations between spoken words and objects, Schwartz said.

Animated Games

Animated games that teach language concepts are included in other lesson frames. For instance, one frame contains a picture of a slot machine. When the student points to the handle and presses down on the control button, the slot machine's wheels, which contain pictures of various fruits, a bell and a bar, begin rotating, Schwartz said. As each wheel stops on an object, the student hears the foreign word for it, and if the machine's three wheels come up with the same object, such as three lemons, the student is rewarded with the sounds of bells, whistles and dropping money, while flashing red lights appear on the face of the machine.

The medium of games and animation allows the learner to become very involved in the exercises and to pick up the basic vocabulary quickly, according to Schwartz. In addition, by allowing constant user interaction with material and easy repetition of individual words, the Slot Machine offers more help to the student than the standard aids to foreign language instruction, he claimed.

The system is similar to Control Data Corp.'s Plato learning system, which has proven to be very successful, Schwartz noted. The major difference between the two is that Plato is only programmed for the English language and learning within that language and that it is based on a larger hardware system. The Slot Machine can be developed much more cheaply, since it uses minicomputers, he pointed out.

The Slot Machine system with 64K of memory is centered around the two parallel processing Interdata 7/32 minicomputers. These machines handle the tasks of sound generation, video graphics, text generation and user interaction. The 7/32s also keep the audio-visual presentation synchronized by communicating with each other across a memory-to-memory I/O bus.

All sounds are digitally recorded on an IBM 2314-type magnetic disk with a capacity for a vocabulary of about 1,000 words. The system now has a 300-word vocabulary.

The user interfaces to the system via a Summagraphics Corp. digitizing tablet and pushbutton control. The system uses a PL/I with some Assembler and runs under an operating system called Magic 5, which was developed at MIT.

Although the system is still undergoing testing and experimentation, Schwartz contends it will be an important tool for teaching foreign languages to students of all ages.

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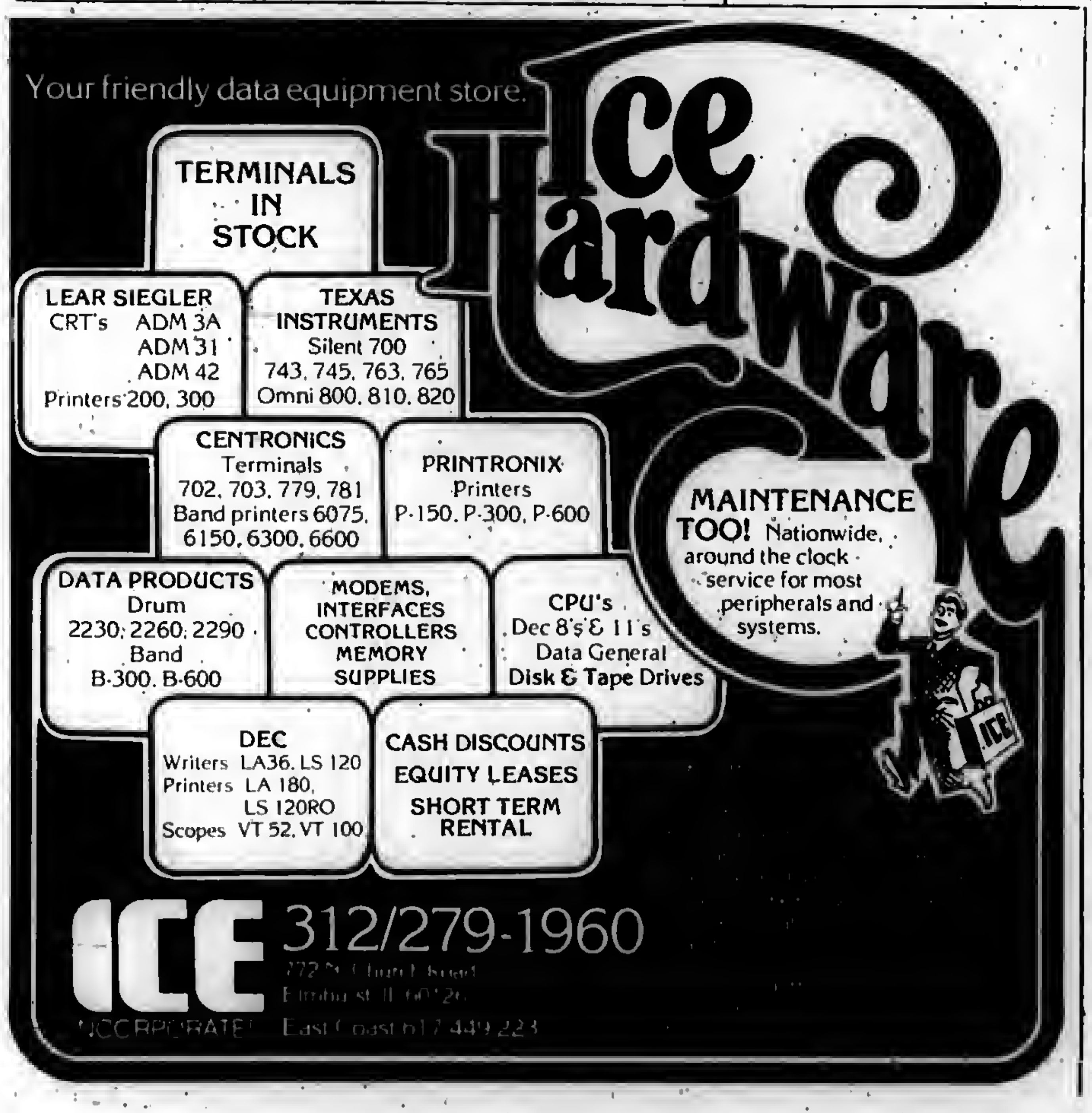
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Authors are requested to present original papers requiring 20 minutes to present. An original and two copies of a one-page, double-spaced, 50-word abstract and an original and two copies of a 300- to 500-word, double-spaced summary of the paper which includes the purpose of the paper, the state of the art and what your work has contributed (without author's name, address or company) should be submitted no later than Feb. 1 to Cleveland Electronics Conference, Inc., Fifth Floor, 2728 Euclid Ave., Cleveland, Ohio 44115.

SYSTEMS TECHNOLOGY SYMPOSIUM, National Bureau of Standards, May 17, 1979.

Papers are now being solicited for the "Trends and Applications 1979: Advances in Systems Technology" symposium. The program committee is interested in advanced developments in the following areas: advanced computer architecture, distributed processing, micros in consumer products, office systems technology, networking technology, embedded micros and security from a systems viewpoint. Papers dealing with evolving applications for advanced computer systems technology or the societal impact of such new technology will also be welcomed.

Authors should submit three copies of a 1,000-word abstract by Dec. 15 to Patrick V. McGregor, Network Analysis Corp., 410 Pine Street, Vienna, Va. 22180.

SEVENTH CONFERENCE ON ELECTRONIC COMPUTATION, Washington University, St. Louis, Mo., Aug. 6-8, 1979.

A wide variety of engineering computing topics will be covered including minicomputer applications, microprocessors and smart terminals, distributed computing, interactive graphics, structural dynamics analysis methods, nonfinite element methods, finite element idealization studies, large-scale linear equation solvers, eigensolvers, ordinary differential equation solvers and nonlinear methods, interactive analysis and design, supercomputers and applications, computer-assisted project management and computing applications in small offices.

Authors are requested to submit abstracts of approximately 500 words on suitable topics. All abstracts must be received no later than Jan. 3.

Abstracts should be sent to Dr. James L. Tocher, Boeing Computer Services, Mail Stop 9C-02, P.O. Box 24346, Seattle, Wash. 98124.

And Help Cut $500,000 Deficit

On-Line System to Speed City's Water Billing

By Marguerite Zientara
CW Staff

JACKSON, Miss. — In an effort to reduce an "extremely high" budget deficit stemming from unpaid and overdue water bills, the City of Jackson Water Department will soon switch from a batch to an on-line system for its meter reading and billing systems.

Although the deficit has been estimated at more than $500,000, Water Department Director Kirby Bowron said that figure represents both water and sewerage charges as well as some bills that are too old to be collectible.

"We're in the middle of an audit to arrive at an accurate figure so we can clean it up and write some of it off," he said.

The department's troubles stemmed from its previous virtually manual billing system, combined with a 75-day lag between the date a bill was issued and the date it was due, Bowron explained.

Former Collection Method

Under the old system, meter readers went out in the field and brought back the results on mark-sense cards, according to Bill Hazelwood, city DP manager.

After the Water Department checked the cards for irregularities, it sent them to the city's DP center, which ran edits and then returned the cards to the Water Department for another look. Finally, customers were billed, Hazelwood said.

"The problem was, we were billing about 60 days after the meters were read," Hazelwood said.

Terminals for the new system, to be implemented in two phases, went online Oct. 2 for processing "everything from new applications and service orders to the billing itself," Bowron said.

Although the meter readings are now entered directly into the CPU via the terminals, if there is any question on a bill, it is "kicked out" and the department must send someone out to reread the meter.

Phase II of the new system, scheduled for next spring, will put walkie-talkies into the hands of meter readers so they can communicate directly with terminal operators back at the office, Bowron said.

If a particular meter's reading indicates usage very different from usual, the computer will reject the reading and send a message to the terminal operator immediately so the meter reader can confirm it or reread the meter, Hazelwood explained.

"With the new system, the guy is standing right there and he can read it again right away," Hazelwood said.

Since the data will be entered into the system right after the meter is read, the bill will be printed the next day. Consequently, customers will receive their bills about three days after the reading instead of 60 or more days later, as they do now, Hazelwood said.

Department's Goals

The goals of the system are an improved cash flow, a reduction in accounts receivable, improved speed and accuracy, Bowron said.

In addition to the technological improvements, he said, there will be a 30-day maximum lag before the bill falls due, instead of the present 75-day lag.

"With the system, it will be easier to spot delinquent payments through the reporting and management tools the system provides," Bowron noted, "so we will have better control over such delinquencies."

The Water Department ties into the city's computer, which is also used by other city departments.

The city now uses a 400K-byte Honeywell Inc. Model 2050A with six tapes and seven disks, each with a 60M-byte capacity, Hazelwood noted.

The present system also includes a Honeywell Model 122-3, 900 line/min printer and a Model 122-4, 1,100 line/min printer, Hazelwood said.

While the Water Department has been using the computer system for printing reports, its meter reading and billing systems have been done manually, until recently, according to Bowron.

While the department went on-line to the 2050A in October, a Honeywell Model 6605 will replace the 2050A in about two months, according to Hazelwood.

The 6605 has 1M byte of main memory and will connect to two Honeywell TRU 1200 printers, operating at 1,200 line/min, he noted.

Of 22 new terminals for the city, nine belong to the Water Department, Hazelwood said. Along with those nine Racal-Milgo System 40 terminals, the Water Department will have three Racal-Milgo 30 line/min Model 20 remote printers, he explained.

The city's new system will also have six disks, three with 100M bytes of memory and three with 200M bytes, Hazelwood said. There will also be six tapes, a card reader and card punch.

A Honeywell Model 6624 front-end minicomputer with 64K of memory will run all the terminals hooked to the system.

The terminals in other city departments will be Honeywell Model 7700s, Hazelwood said.

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Managers on the Move

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KERWIN C. NAILOR has been appointed an officer of the Penn Mutual Life Insurance Co. in Philadelphia.

Nailor, who has been with Penn since 1965, is manager of DP auditing, responsible for staffing and directing the company's DP auditing program. This includes reviewing new and existing systems and auditing other computer operations.

The Broomall, Penn, native is a 1970 graduate of Villanova University.

• • •

DR. ALBERT MEYER has been appointed associate director of the Laboratory for Computer Science at MIT.

Meyer is a professor of computer science and engineering in the Department of Electrical Engineering and Computer Science. An MIT faculty member since 1976, he was appointed professor in 1975, Meyer is a graduate of Harvard. He has authored more than 40 technical papers.

JAMES G. DYCUS and FREDERICK A. MISTRETTA have been named assistant vice-presidents of the Trust Co. of Georgia. Both are assigned to Trusco Data Systems, the holding company's statewide DP organization.

Dycus has been with Trust Co. of Georgia since 1969, when he started as a computer trainee. Appointed an operations officer in 1976, he works in operations.

Mistretta, who works in systems and programming, joined the holding company in 1973 as a programmer/-analyst. In 1976, he was appointed a systems officer.

• • •

ROBERT W. RAUSCHER has been promoted to assistant vice-president of HDR Systems, Inc. of Omaha, Neb.

Rauscher will serve as management informations systems director and handle all computer applications for the computer systems company.

A graduate of the University of Colorado at Boulder, Rauscher has a masters degree in mathematics. He has been a senior consultant at HDR Systems since 1974.

• • •

LARRY R. ELLIOTT, DANIEL L. HERRYGERS, and LESLIE L. NEUMEISTER have been named to management positions at GTE Data Services (GTEDS).

Elliott has been named division operations manager at GTEDS' Muskegon (Mich.) Data Center. He is responsible for completing all I/O requirements of the data center, as well as directing operations activities.

Elliott began at GTE as a programmer at General Telephone of Indiana in 1967 and transferred to GTEDS in 1969.

Herrygers has assumed the post of division systems manager at the Muskegon Data Center. The Hart, Mich., native graduated from Ferris State College in Big Rapids, Mich., in 1972, when he began working at GTEDS as a computer operator.

Herrygers is responsible for coordinating all systems and programming activities.

Neumeister, formerly operations staff director at GTEDS' Network and Engineering Group, has been named general manager of network services. The Phi Beta Kappa graduate of Duke University received an A.B. degree in economics.

Neumeister started in data processing when he joined IBM in 1956. He has held a number of positions at GTE since 1960 and has been operations staff director since 1974.

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Professor at Kent State Using Mainframe to Trace Dutch Migration to U.S.

By Marguerite Zientara
CW Staff

KENT, Ohio — In a project that would be "impossible" without the aid of a computer, a history professor at Kent State University here is tracing the migratory movements of 55,000 Dutch from The Netherlands to America between 1820 and 1880.

Dr. Robert P. Swierenga, who has been working on the project for 12 years, hopes to determine whether specific migratory patterns are possibly dependent on variables like sex, occupation and religious affiliation of the U.S. immigrants.

"Computers let me look at civilization from the bottom up," Swierenga said. "We can deal with all the very ordinary people instead of just the very famous."

Swierenga's interest in the project started in 1967, when he was teaching at Calvin College in Grand Rapids, Mich. He "stumbled across" microfilmed records there from the National Archives of The Netherlands. These records tracked emigrations from Dutch municipalities — comparable to U.S. counties — to anywhere in the world.

Trip to The Netherlands

Swierenga, who is third-generation Dutch, became interested enough in the emigration records to transpose them into machine-readable form. But since they were not complete, Swierenga traveled to The Netherlands in 1976 under a Fulbright Scholarship to collect more records about the 20,000 Dutch families who emigrated to the U.S. in the 60-year period.

By visiting 11 regional archives and many municipal archives in The Netherlands, Swierenga found 2,500 to 3,000 more names of Dutch people who emigrated from The Netherlands to America prior to 1848.

The second stage of Swierenga's data gathering led him to review 100,000 U.S. National Archives' passenger lists from ships that arrived in the U.S. between 1820 and 1880. With one to three students aiding him at any one time, Swierenga manually checked these lists for Dutch immigrants.

The lists contain such information as the immigrant's name, age, sex and occupation and the ship's ports of embarkation, and debarkation.

Nine years later, the task was complete and Swierenga moved on to his third set of data, population census lists from the U.S. Census Bureau covering the years 1850 to 1880. "If there were more than 100 Dutch in a U.S. county by 1880," he said, "I added the name of the county to a list. Now I'm going through the microfilm culling the names of all the Dutch-born families."

More Work Ahead

Although Swierenga foresees three to five more years of work on the project, historians have already benefited from his work. A dozen libraries and associations have paid for computer time to get duplicates of an alphabetized list of 55,000 Dutch immigrants that he produced using the computer.

Besides the alphabetical listings, Swierenga has run computations on his data to produce some preliminary conclusions. "The main things I've found are that 80% of the Dutch people migrated as families, a higher percentage, I think, than any other Northern European immigrant group, and roughly 80% of the immigrants were from rural communities in The Netherlands," he said.

Ninety percent of the Dutch immigrants Swierenga has studied come to the U.S. as opposed to other countries, he noted, adding that is "a very high figure." They were interested in farmland and headed for the Midwest, seldom remaining in U.S. cities.

"It was not a famine migration, like the Irish, when the people were trapped in Boston and couldn't afford to go inland," Swierenga explained. "Most of these people could afford to buy land."

His computations have also shown that more than 80% of the immigrants arrived in New York City, usually traveled along the Erie Canal and settled in western Michigan; southern Wisconsin, northern Illinois and Iowa.

Future Goals

When his research is complete, Swierenga hopes to have analyzed Dutch migration patterns in light of more than 40 variables. He will study the Dutch municipalities in terms of their population size, density and growth rates, sex ratios, religious configurations and occupational data.

In addition, Swierenga will consider the number of people who were born in a Dutch municipality and who are still there, the number of people who were born elsewhere and then moved to The Netherlands, as well as tax data indicating the wealth of the land and agricultural data showing the nature of the farming that went on.

"I want to try to explain the variation in the out-migration rate," he explained. "I'd like to see if, for example, the agricultural makeup or religion, or a combination of variables, might be an explanatory variable."

Swierenga envisions the possible end product of his work as a two-volume book about the "anatomy of Dutch immigration." He hopes eventually to make a point-to-point analysis of the Dutch "from where they originated to where they settled.

"I'm hoping to link as many individual families as possible," Swierenga said, "starting with the Dutch lists indicating their origins, through the ship lists telling the ports they came through and finally with the U.S. Census lists showing where they ended up."

Swierenga used "canned" software from SPSS, Inc. of Chicago for most of his programs and said it is "very easy to use." The package allows him to do most of his recoding and statistical tests easily, he noted. For such programs as the record linkage, however, Swierenga relies on the technical staff at Kent State University.

He uses Kent State's Burroughs Corp. B6700 computer with 1.2M bytes of memory and two printers.

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System Helps People Choose Leisure Activities

By Ann Dooley
CW Staff

MILWAUKEE — The Milwaukee Public School System is using an automated system to determine how individuals should best spend the extra leisure time automation has given them.

Many people don't know how to fill their free time or even what activities are offered in their communities, according to Dr. Joseph Mirenda, adult education administrator for the Milwaukee Public Schools.

To help remedy this situation, the school system developed a leisure counseling model in conjunction with the University of Missouri at Columbia. The model has been in use since 1974 in Milwaukee and is reported to be the only one of its kind.

The leisure model was designed to be used manually or with an automated system, depending on what resources are available to the agency providing the service, Mirenda said. The results are the same in both cases, but it is faster and more efficient to process them by computer.

Adults Only

The leisure model is available only to adults and is composed of three parts: an interest finder, an activities file and an inventory file.

The interest finder is an assessment tool that helps adults discover where their interests lie within a wide range of leisure-time activities. Ninety activity statements are included on the form, and the user rates each on a five-point scale according to his interest in the activity. The rating scale is used to chart the respondent's profile sheet, which gives a graphic representation of interest catagories. Users rate statements concerning activities such as fishing, stamp collecting or playing dominoes.

The activities file consists of complete descriptions of available activities, including requirements for participation, rules, equipment needed, the equipment cost and environmental factors. Also included are the activity's handicap limitations and social and psychological benefits, Mirenda said.

The inventory file consists of information from other sources and includes a variety of agencies, clubs and group activities from within the Milwaukee community. Brochures, catalogs, newspaper clippings and personal contact are some of the sources used for data.

Keeping this information current is a constant problem and, although the material within the system is somewhat dated right now, it will all be updated soon, Mirenda said.

Nine major activity categories are stored in the system, including games, sports, nature, collection, homemaking/homecraft, art and music, educational, entertainment and cultural, volunteer and organizational topics. Each of the nine catagories are further subdivided into specific examples and types. Both the activities and inventory files are coded and cross-referenced into a system of 999 leisure activities.

It was essential to include a wide variety of activities because the school system wanted a model that would accommodate the many individual interpretations of "recreation," Mirenda stated.

Although Milwaukee is the only city presently using the model, it is available to others. If a city or organization doesn't have access to an automated system, a counselor would be needed to manually select those catagories ranked highest in interest by the participant and match them with 15 to 20 leisure activities available in the area.

Where computer capabilities exist, age, sex, occupation and other identifying data on the respondent, as well as the 90 interest responses, are coded for insertion into the system by an optical scanner.

The Milwaukee Public Schools uses a National Computing Systems, Inc. 8K-byte 7010 optical scanner that codes the data onto tape which is then entered into the school department's IBM 370/148 mainframe. The CPU also includes an IBM 1403 printer to provide output for respondents. The program was written in PL/I and runs under DOS/VS.

Once the information is entered into the system, a profile sheet is printed out in minutes. Included on the profile sheet are average scores for each of the nine catagories and subcatagories along with the top four scores of all the catagories represented.

Based on the respondent's high interest areas and any additional criteria he has set, the system will match activities on a citywide basis from the information stored in the system. The respondent is then given the profile sheet and list of activities that includes times, fees, equipment needed and activity sites.

Although vocational counseling preference models have been in operation for some time, little attention has been directed toward leisure modeling, according to Mirenda.

Most of the individuals using the Milwaukee leisure service are persons returning to the mainstream of society, like former drug addicts, alcoholics, prison inmates or those in a halfway or sheltered population.

One alcoholic treatment center has been sending 60 to 65 participants a month to the service so that these people can find fulfilling activities.

The elderly, ill or handicapped are also frequent users, Mirenda said.

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'Very Peculiar Specialty'

Travel Firm Smooths Last-Minute Bookings

By Marguerite Zientara
CW Staff

BOSTON — If fire broke out on a North Sea oil rig, a unique travel agency here could use direct terminal hookups to national airlines and European travel bureaus to speed a fire fighter to the site.

However, Woodside Central's "very peculiar speciality" is more often making short-notice reservations for corporate executives, lawyers and salespeople than helping fight fires, according to Thornton Clark, the agency's executive director.

Woodside makes both long- and short-notice reservations for business travelers from thousands of corporations daily via its direct terminal hookups to 19 airline, hotel and car rental reservation data bases.

At the Summit

Woodside considers itself "the culmination of the travel industry's move toward computer automation" according to Clark. The company, owned by 27 of the world's largest travel agencies, makes two million business travel reservations per year for corporate clients throughout the U.S. and Europe.

For 55% of those itineraries, the initial telephone call to Woodside is not made until the day of departure. "Plans keep changing in a large percentage of business travel, and the final plan isn't developed until the day of or the day before departure," Clark said.

He added that planning ahead with the help of daily computerized reservation statistics enables the agency to make short-notice reservations in the face of airline and hotel space crunches.

"Because we have so many millions of reservations flowing through one central place, we're able to predict our needs," Clark explained. "For example, we can see that in January, when things get tight during the Chicago housewares show, we'll need about 160 rooms every night for a week. We'll negotiate for a block of rooms, commit ourselves to that space and then sell the availability out of our inventory as the names flow into this office."

Centralized Arrangements

Because the 27 independent travel agency owners voted two years ago to merge all their land arrangement functions into the central reservation office, a San Diego hotel booking for someone in Los Angeles will still go through one of 19 computer systems to the Boston office.

The Boston office employs 36 people and has up to eight terminals for each of the 19 computer systems into which it hooks, "which is what makes the place a zoo," Clark said.

Its terminals are linked directly with the data bases of American Airlines, United Airlines, TWA, Allegheny Airlines, Air France, Pan American Airlines, Hertz Rent-A-Car, Avis Rent-A-Car, National Car Rental and Budget Car Rental.

It also has hookups to Holiday Inn, Hilton, Ramada Inn, Best Western, Howard Johnson's, Western International, Quality Inn, Sheraton and Marriott hotels' data bases.

While the number of direct-access terminals makes the center's work possible, it also makes training complicated because there are keyboard, format and procedural differences for each one of the systems, Clark noted.

High Volume, Low Rates

Besides the ability to make speedy reservations, Woodside Central claims accuracy and lower rates, not typically given to the public, as a result of high volume of corporate transactions.

"Instead of relaying a message to someone at a company's reservation center who doesn't know us or our clients," Clark said, "we are responsible for the accuracy of entering the data directly into its data base. And by having our reservations go directly into the systems, we can be sure we always get the right rate."

The Woodside Group of Travel Agencies, consisting of the 27 agencies, employs 1,400 people in 92 offices in major business centers of the U.S. and Europe. There are 24 offices in Europe, and that number will grow to 50 when a network linking Scandinavia is installed, Clark said.

An agency in Mexico City went online last month, he noted.

The agencies deal with individual clients and relay messages to the Boston office, where terminals of "every different shape and size under the sun," from such firms as Raytheon Co., Harris Corp., Incoterm Corp. and IBM are used for processing, according to Clark.

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Seamen's Log Data May Help Save Whales

By Tim Scannell
CW Staff

PROVIDENCE, R.I. — The yellowed records of 18th and 19th century sea captains listing the details of ancient whaling conquests may hold the key for the future survival of the whale, according to a researcher at Brown University.

Stuart Sherman, a professor of bibliography, is using a computer to catalog the information contained in more than 4,000 logbooks and journals collected from various libraries as well as from the attics and basements of seafarers' descendants. When analyzed, the records may help show that an abundance of whales once roamed the seas and that a present scarcity indicates an impending extinction, Sherman said.

On the basis of the computerized whaling information, the 17-nation International Whaling Commission can decide what species can no longer be commercially sought and can put quotas on the number of whales that may be taken, Sherman said.

"We know that there are fewer whales, based on pretty sketchy facts," the researcher explained, noting that inadequate data on feeding grounds, migration patterns and location at a given time of the year make it impossible to take an accurate census of the whale population.

Logs' Details

The antiquated ships' logs report the date, time and approximate location of the ship when a whale was first sighted or harpooned. "A captain would also keep information on migrations and feeding grounds," Sherman stated, and "every year he would add to what he had learned."

Each journal page, carefully ruled with columns for different categories of information, would also indicate how much oil or flesh a particular mammal yielded. Data such as this, Sherman noted, could be used to compare the size of whales in the past with whales today and possibly pinpoint any noticeable changes in the age distribution or health of the remaining population.

"My job is to try to locate the records that will be of value to [whale] population experts and cetologists who try to estimate the original size of various species some 100 or 150 years ago," Sherman said. "Then, by an examination of these records, we hope to determine how many whales were actually killed and how many were struck and lost. This will give us some idea of the reduction of the herds."

There is no doubt that whales are headed for extinction, according to Sherman. However, the difficulty lies in trying to gather enough evidence to convince the Soviets, the Peruvians and the Japanese that the multitonned victims of their floating fish factories are an endangered species.

Sherman extracts pertinent information from each of the whaling logbooks and edits it in a "uniform, standardized format." The prepared information is then submitted to Brown University's computing lab, where the data is input to a 2M-byte IBM 360/67, via terminal, processed and then transferred to an "archive" disk. The information on the disk is updated each time new journal information is added and used to produce a list which will eventually make up the final inventory Sherman hopes to complete late this spring.

When the archive disk is complete, he continued, the whaling data base can be used for supplements and an occasional total revision of the master list. "In other words, I hope what I produce next spring will not be the last compilation," he said.

The professor's research, which he contends began 30 years ago with the literary chronicles of Herman Melville and an interest in maritime history, is funded by a $3,600 award from the U.S. Marine Mammal Commission.

Time is the greatest enemy to Sherman and to the various "save the whale" organizations working to stave off the mammal's extinction. "About six or eight years ago, around 70,000 whales were taken and that figure has declined every year since," the researcher pointed out. This is "mostly because of the growing nonavailability of the whale," he said.

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Calendar

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Jan. 8-9, Honolulu — **Pacific Telecommunications Conference (PTC '79)**, sponsored by the Communications Society of the Institute of Electrical and Electronics Engineers. Contact: PTC '79, Social Science Research Institute, University of Hawaii, No. 704, 2424 Maile Way, Honolulu, Hawaii 96822.

Jan. 8-10, Boston — **Developing DP Systems for the General Ledger.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

Jan. 8-10, Washington, D.C. — **Action Tools for Women Managers.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Jan. 15-18, Atlanta — **Automating and Integrating Purchasing Accounts.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

Jan. 16, Costa Mesa, Calif. — **Invitational Computer Conference.** Contact: B.J. Johnson & Associates, No. 203, 2503 Eastbluff Drive, Newport Beach, Calif. 92660.

Jan. 19-20, Hanover, N.H. — **Sixth Annual Conference on Instructional Computing**, sponsored by New England Regional Computing Program (Nercomp). Contact: R. Gibbs, 40 Grove St., Wellesley, Mass. 02181.

Jan. 21-24, Denvery — **Winter Conference of the Optical Character Recognition Users Association.** Contact: OCR Users Association, 10 Banta Place, Hackensack, N.J. 07601.

Jan. 21-27, Chicago — **American Library Association (ALA) Midwinter Meeting.** Contact: ALA, 50 Huron St., Chicago, Ill. 60611.

Jan. 22-26, London — **Computers and Peripherals Trade Show**, sponsored by U.S. Department of Commerce. Contact: E. Belden, U.S. Department of Commerce, Bureau Export Division, Washington, D.C. 20230.

Jan. 22-26, Clearwater Beach, Fla. — **Personnel Productivity in Data Processing**, sponsored by Keston Associates. Contact: Dr. Robert Keston, 11317 Old Club Road, Rockville, Md. 20852.

Jan. 24-26, Phoenix — **Planning a Productivity System.** Contact: Theorem Institute, Suite 590, 1737 N. First St., San Jose, Calif. 95112.

Jan. 24-27, Tokyo — **International Microcomputers/Minicomputers/Microprocessors '79 Japan.** Contact: ISCM Ltd., 222 W. Adams St., Chicago, Ill. 60606.

Jan. 29-31, Washington, D.C. — **What Managers Ought to Know About Minicomputers.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Jan. 29-Feb. 2, Laguna Beach, Calif. — **How to Develop an Effective Long-Range Data Processing Plan**, sponsored by Keston Associates. Contact: Dr. Robert Keston, 11317 Old Club Road, Rockville, Md. 20852.

Jan. 30-Feb. 1, Washington, D.C. — **Communications Networks Conference & Exposition.** Contact: The Conference Co., Newsroom, 60 Austin St., Newton, Mass. 02160.

Jan. 31-Feb. 2, Houston — **The Data Base Course.** Contact: Management Resources International, 6621 Electronic Drive, Springfield, Va. 22151.

Jan. 31-Feb. 2, Paris — **Third International Seminar — Seminar in Banking**, sponsored by the Institut de Recherche Interbancaire (Insig). Contact: Insig, 5 Rue Quentin Bauchart 75008, Paris, France.

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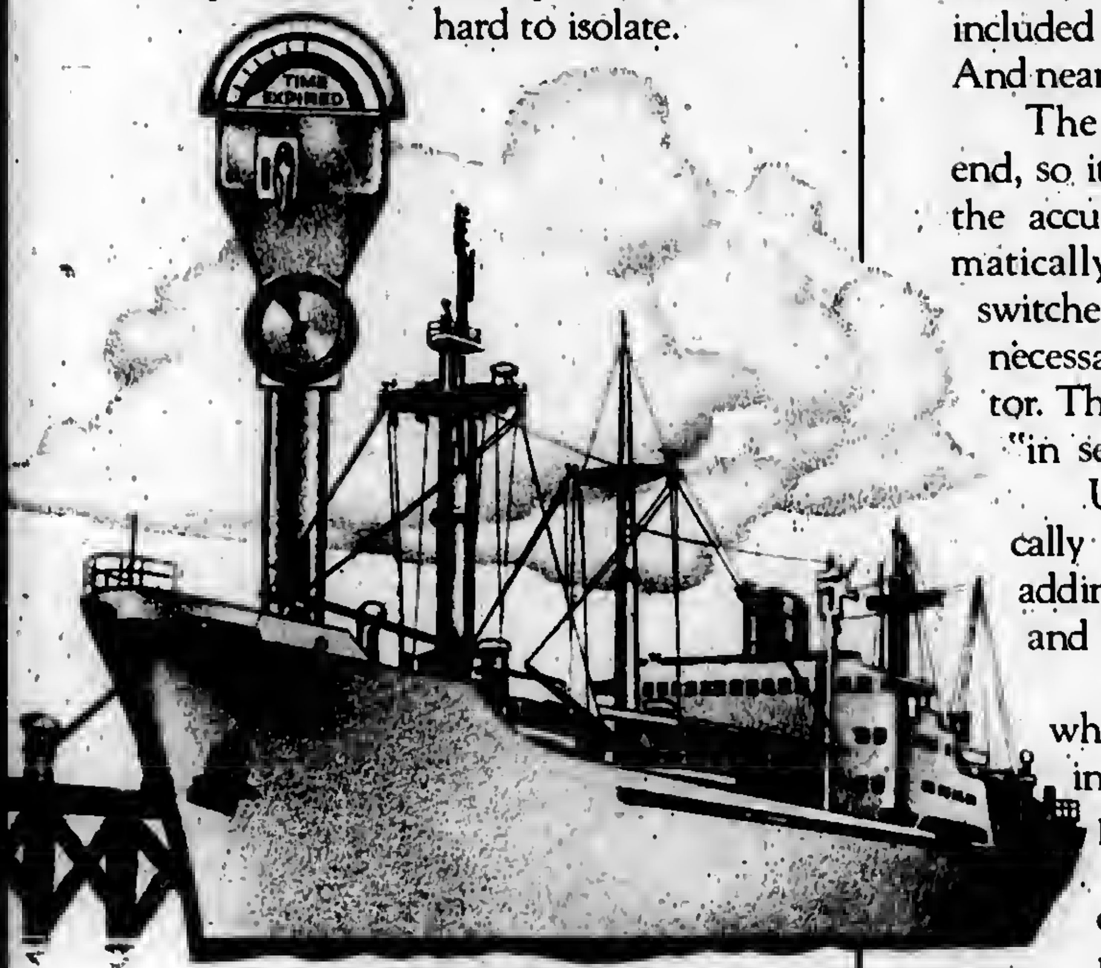

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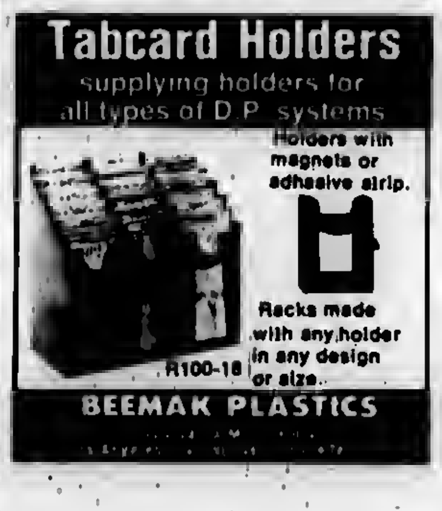
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Editorial

The Need for Redundancy

In recent weeks, memory overloads and component failures in the mainframes used by the Federal Aviation Administration's (FAA) Air Route Traffic Control System have been blamed for traffic delays in the Chicago and New York areas, both of which are among the busiest air traffic regions in the country.

But late arrivals and departures are a manifestation of a more serious problem. They occur because air traffic controllers must assure safe separation of aircraft traveling 500 miles an hour or more, and when it comes to priorities, safety is certainly more important than tight schedules.

During computer failures like this, the data block that identifies each blip on a controller's display screen by airline and flight number and also provides its altitude and airspeed is no longer printed out next to the blip and controllers must quickly switch over to the FAA's backup system.

This involves moving the display units from a vertical to a horizontal position and writing the necessary flight data for each aircraft controllers are handling — anywhere from nine to 20 — on a plastic chip and placing that chip next to the blip on the now-horizontal radar screen.

They then update this data from information supplied by voice communication with pilots.

This backup system of air traffic control uses broadband radar, rather than radar tied in with computerized displays. This broadband system was employed for many years in even the busiest locales in the U.S. and is still used in many parts of the U.S. and the world. It is a system the FAA staunchly defends.

The FAA contends that skilled controllers can operate both systems and even a third far more rudimentary one that relies completely on radio information prescribed by FAA procedures manuals for situations when even the radar systems go down.

However, many people believe the transition from one system to the other is a scramble and constitutes a hazard to flight safety.

Controllers being recruited and trained by the FAA today get limited training in broadband control. Many have said it is inferior to the computer-assisted method now in use — as long as that computer-assisted system is working. But it's not 100% reliable. Reports from controllers cite sporadic difficulties that frequently occur when software patches are implemented.

This discussion boils down to one point, however, and that is the critical need for system reliability and redundancy.

It's one thing for a system to go down in the middle of a payroll run. It's quite another when a system being used to ensure the safety of hundreds of airline passengers ceases to provide necessary data.

As more computerized systems are utilized for health and safety applications — such as controlling life support systems in space capsules and heart monitors in hospitals — as well as air traffic control, failsafe systems become critical.

These surely are cases in which redundancy — yes, duplicate systems sitting idle until *they are needed* — is absolutely justified. And any argument about the cost is irrelevant.

How can the FAA put a price tag on the people aboard a 747, a Lear Jet or even a Piper Cub — to say nothing of any people on the ground — who might be injured or killed if an accident occurs?

Data Past

Five Years Ago
Dec. 5, 1973

NEWTON, Mass. — The majority of DP managers remained indifferent to the effect a major energy crisis might have on their shops, according to a Computer*world* survey. Eighty-three percent said they had not set, or given any thought to setting, priorities on their job runs. Sixty-seven percent of those interviewed had not made any provisions for back-up in the event of brownouts or blackouts.

— — —

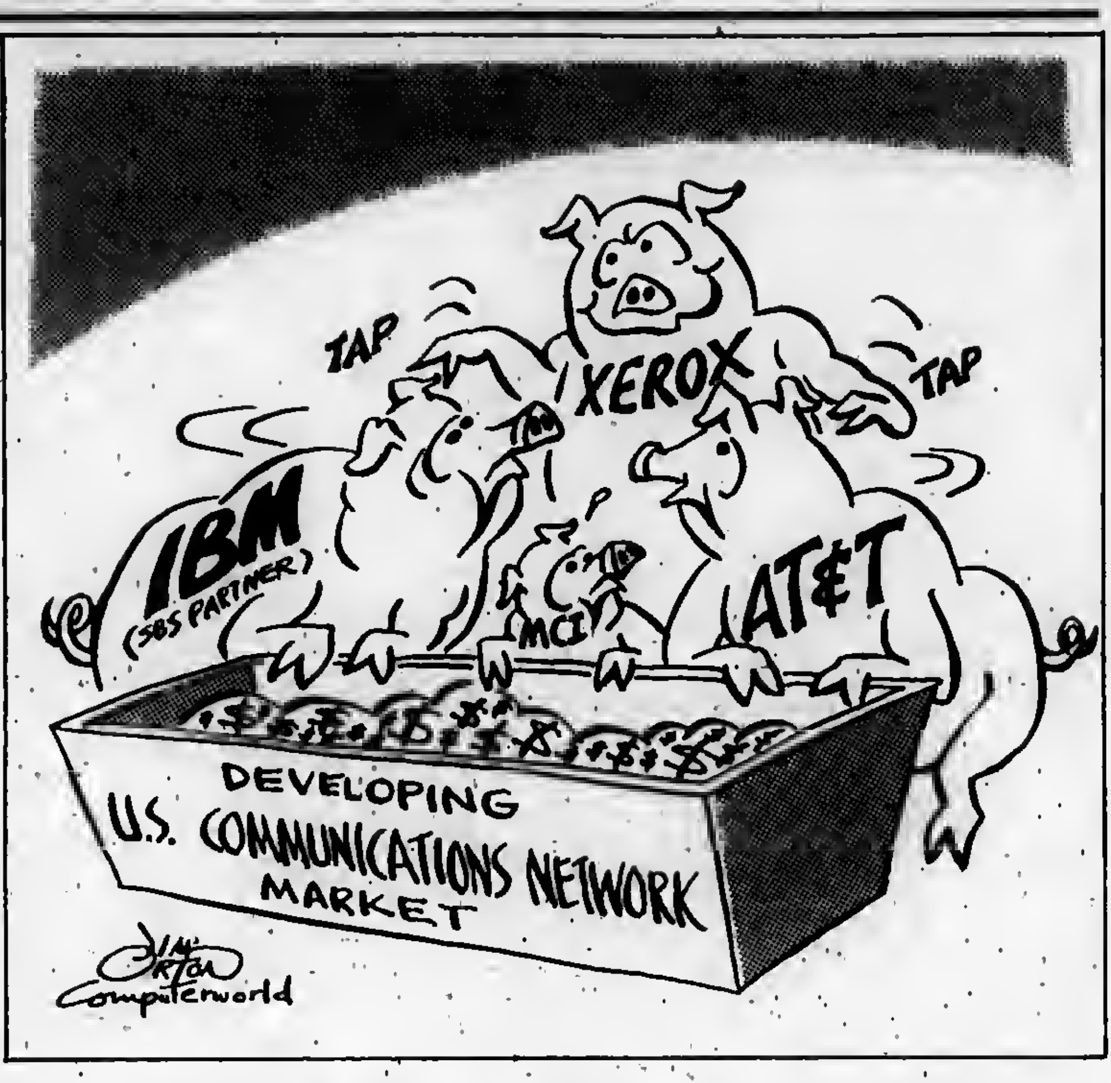
PHOENIX — A national law enforcement communications network that was scheduled to begin operations on Christmas Eve would eventually tie all the nation's motor vehicle records into one on-line data base. The National Law Enforcement Teletype System would initially be a store-and-forward message-switching connection between the states' police agencies.

Eight Years Ago.
Dec. 9, 1970

Police detectives and crime commission investigators reported the Mafia had been using computers for success in the numbers racket. According to a DP analyst, the loss potential of numbers could be predicted from a "characteristic" trend in betting determined by the computer from an analysis of placed bets, winning numbers, percentages of payoffs and types of numbers used.

— — —

MINEOLA, N.Y. — The First National City Bank's computer here was credited with smashing an organized ring of credit card thieves and recovering 167 stolen cards, after several New York banks lost about $500,000 to the ring. At least three persons were arrested as a result of a five-week investigation, started after the bank's computer pinpointed one merchant's unusually high credit transaction rate.



Letters to the Editor

Product Not a First

I believe an erroneous statement was made about Cullinane Corp.'s VM/CMS version of IDMS being the first commercially available data base management system (DBMS) to run in the VM environment [CW, Nov. 13].

A quick review of the International Computer Programs (ICP) or Datapro Research Corp. software directories indicates several other DBMS operate in the VM environment.

These include our own Focus, System 2000 from MRI Systems Corp. and Total from Cincom Systems, Inc., to name a few.

David R. Kemler
Director of Marketing
Information Builders, Inc.
New York, N.Y.

In Defense of Fellow DPers

I can't count the number of times I intended to write a letter like this but never got around to it. After reading the "Human Connection" articles by Jack Stone and Joan Hendrickson [CW, Nov. 13, Nov. 20] I'm finally going to follow through.

I'm doing this primarily to defend my associates against many of the rather generalized assertions in the articles and secondarily to avoid any "passive characteristics when dealing in special social situations."

The authors imply that DPers take an excessively long time to analyze and answer a question such as "What are you truly looking for in a relationship?" Well, this isn't like asking someone, "Do you have change for a five?"

The articles went on to point out the "dead personalities" and "lack of the wonderful spontaneity that makes life so exciting." Hendrickson should have been with me the day I informed the supervisor of operations that an eight-hour Saturday run was worthless because of a user's input error.

I also recall the time just prior to program installation that I told a programmer for the seventh time the user wanted a change. His face "became alive," his "voice strengthened," his "gestures became more animated", what followed is not fit for publication. We're still looking for the rest of the source deck.

Regarding the statement that "DPers are the least trustful of all of our clients," Hendrickson obviously doesn't handle any auditors. *They* may be the group that "needs help dealing with others in a feeling kind of way."

I don't pretend to be an expert on human behavior, but my experience with DP people has proved them to be as emotional, compassionate and human as any other group. A lack or abundance of warmth and feeling is a personal characteristic and not attributable to a profession.

And in answer to Hendrickson's question concerning the success of computer people in the business world — yes, we are.

Mickey Charlton
Solon, Ohio

Disturbed on Three Counts

With regard to "Report Finds Causes for Colleges' System Bugs" [CW, Nov. 13], I cannot decide if the most disturbing aspect is that:

1. The Vermont State Colleges would commission a one-day study and expect any meaningful diagnosis and/or recommendations to result.

2. Any reputable consulting firm would purport to be capable of performing a one-day study of any value and would, in fact, accept such an undertaking.

or 3. By reporting on it in Computer*world* and repeating the ridiculous statements and conclusions made by both parties, CW lends credence to such efforts.

Herbert S. Lunenfeld
Rockville, Md.

(Other letters on Page 24)

The Human Connection

DP Free-Lancing Expands Jobs for Women

By Jack Stone
And Ida Mason
Special to CW

As we have traveled around the country, talking with DP societies and organizations, it has become evident that women are assuming major roles in the development of the information systems business — and in all areas, ranging from technological research to machine operations in the production center.

Although men still hold the majority of top management positions, women have met with considerably less prejudice and more equality in DP than in most other fields. And it may be that an organization operating in England and planning to expand to the U.S. will provide major new opportunities for women in the DP community.

F International is one of the oldest software houses around, with headquarters in Buckinghamshire, England. It was founded in 1962 by "Steve" Shirley, who now serves as a director of the company. The company has grown to about 350 people and conducts operations throughout the British Isles and Scandinavia.

The fact that Shirley had had her own first child about the time she organized the firm encouraged her to create an environment in which women with children could work on a free-lance basis. Although the company was established to accommodate working mothers and their family situation, it does not discriminate against men who make up a small but important part of the personnel complement.

It is interesting to speculate on how this "organized free-lancing" might operate in the U.S.

Enough Interested?

First, are enough women here interested in free-lance systems development? Well, there certainly were plenty to go around for F International, but we wonder if American women at home with the kids really want to handle a part-time systems job or would rather wait until they can work full-time for a more conventional firm.

Second, are available women qualified? At F International, each consultant, analyst and programmer is perceived to be highly skilled, having an average of 10 years' experience as a consultant or denizen of a computer center. Minimum entry requirements include three to five years of training, depending on the assignment.

Can a team of part-time professionals function effectively as a systems team? Project managers are expected to prepare their own proposals for new assignments, keep track of team member productivity and make financial estimates for each job.

Each project manager also has what amounts to operational autonomy and must negotiate contract terms using established guidelines. And the project manager must deploy staff, allocate budget and be accountable for each project through all the development phases.

On the one hand, the challenge is in the job all right, but it may be overwhelming.

Lack of Hierarchy

Will the lack of an established corporate hierarchy be an advantage or disadvantage to the team member? Project leaders are chosen only for the duration of a particular project. The part-timers are continually shuffled between projects and handle many changing roles and responsibilities. The swim of tasks could be viewed as exciting to some and unsettling to others.

Will American information systems departments respond positively to free-lance software firms? This style, known as "cottage industry" abroad, has been long accepted in many other countries, but here it would be considered an unusual way of doing things, at least for the larger computer centers who probably view such operations as a bit too fragile, particularly for long-term dealings. But there is still a large volume of business activity with the small vendors. (It is rumored that every family in Silicon Valley with a garage is building an intelligent terminal!)

Well, we're not going to forecast that the organization concept will really work here or not. We are fairly confident that there are those negativists who would grumble that if it gets under way at all, it would soon yield to the American business pressures to become just another "ho-hum" software house.

But we know for sure that it's an interesting idea, and if it works, it could certainly supply both a partial answer to the current crushing demand for DP personnel and a new outlet for the talents of many women members of the industry.

Ida Mason is a professor of DP at Lehigh County Community College, Schnecksville, Pa., who frequently writes and lectures on the subject of women in management.

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

The Taylor Report

Two Problems Behind Detroit System Failure

By Alan Taylor
Special to CW

It is now unquestioned, four years after its inception, that Detroit's Financial Information and Control System (Fics) — provided by Arthur Andersen & Co. — has technical failures [Taylor Report, Oct. 30]. Local and national newspapers have mentioned it, and, in a report to the city council, Detroit's auditor-general cited "contract provisions that were not complied with" and called for an investigation this past Aug. 23.

Departments keep two sets of books — one to work from and one to keep Fics running — and users claim the contractor didn't ask about or listen to their ideas on the needs of the system.

Certain unresolved details remain. For instance, did the city know it would get a hand-me-down version of a state, not city, financial system from Louisiana?

The observance of one important technical principle and different treatment of technical personnel would have either avoided the problems, or at least avoided an 18-month delay in starting the investigation.

Let's look at these problems. The technical principle concerns the true meaning of "Gigo" in a system analysis environment, and the personnel issue involves a technician who "blew the whistle."

'Gigo' Unappreciated

Gigo (for "garbage in, garbage out") is more than a computer person's excuse for bad computer output. Arthur Andersen and the city of Detroit failed to appreciate its importance as a systems analyst's tool for reviewing computer output.

As he looks at the input formats or file designs an analyst can see what is going to be wrong. A file that only has room for a single, current balance per account, for instance, tells a systems person that checking accuracy in the light of possible misreads or miswrites will be difficult, even impossible.

If he then finds no one knows *how* to do such checking, he can quite properly condemn the whole system.

In May 1977, Detroit's auditor-general recommended against investigating Fics because of an anticipated cost of $50,000 (which apparently came from another auditor management services supplier). This has cost Detroit an 18-month delay in facing up to contractual failures.

It doesn't cost $50,000 to check

(Continued on *Page 26*)

Reader Commentary

Long Zip Means More Than Coding Changes

By Roger M. Loeb
Special to CW

Recent articles and an editorial in *Computerworld* regarding the implementation of the nine-digit Zip Code have concentrated on the type and extent of program modifications that will be required [CW, Oct. 2, 9]. While there is no doubt that virtually every mailing system program, file and print format will require some form of revision, the extended Zip Code also has significant implications in overall systems logic.

At the present time, addressees provide their correct Zip Code in more than 92% of the cases. As a result, most systems that utilize name and address information accept the Zip Code as provided and validate it with only a minor amount of editing.

But since the extended Zip Code will be optional for individuals, it is suspected that the correct nine-digit Zip Code will be received from less than half of the addressees.

Now, invalid Zip Codes can be looked up in the POD 65 directory, which is approximately the size of a large telephone book. The directories required to look up an extended Zip Code would represent a stack of books several feet high and would be very difficult to handle manually.

Although there are computerized directory lookup systems for the assignment of the five-digit Zip Code, the cost of these systems has usually precluded extensive use, particularly since the present Zip Code is provided by the addressee with reasonable accuracy.

In order to ensure the integrity of the extended Zip Code, it will probably be necessary to develop computerized directory search systems covering the entire U.S. at the block face level. The size of this computerized directory will preclude its general use on many of the small computers being marketed today.

As a result, the small businesses using minicomputers and small general-purpose computers will be faced with the difficult choice of manual Zip Code lookup or the cost of software and direct-access storage for the computerized directory. Either choice will result in a significant increase in expense to these organizations.

In addition to the economic incentives that will be offered to business mailers for the use of the extended Zip Code, there appear to be some benefits to offset the additional processing costs. If

(Continued on *Page 24*)

Sell the Steak, Not the Sizzle

I am writing in response to "Stress Product Image, Software Vendors Told" [CW, Nov. 13]. Robert Randolph's message was that software vendors should concentrate their marketing efforts on the product image rather than technical capabilities. Suggestions included spending money on promotion rather than enhancements and bringing documentation down to the eighth-grade level. Translation: "Sell the sizzle, not the steak."

This marketing strategy is the same one that caused domestic auto manufacturers to lose the allegiance of the millions of Americans who want economical transportation. The Europeans and Japanese were ready with the product and the facts.

Letters to the Editor

I am involved in my fourth software evaluation (a data base management system). The vendors who have impressed me knew the software internals and could answer technical questions without fumbling. My advice to the software industry is to forget the sizzle and sell the steak.

Steven Teeter

Campbell, Calif.

Column Incomplete

Alan Taylor's Oct. 30 column made several unfair allegations against the city of Detroit, Dennis O. Green, the former finance director, Marie Farrell-Donaldson, the auditor general, and the accounting firm of Arthur Andersen & Co. The article failed to include pertinent facts that would have provided readers with knowledge of the high integrity of Green and Farrell-Donaldson and the excellent computerized systems installed by the city with Arthur Andersen's assistance.

The article failed to report that Arthur Andersen was selected for the consulting work in the city through the competitive bid process. Because Green had worked for Arthur Andersen prior to his 1973 appointment, he excluded himself from the five-member committee that screened proposals from eight firms before selecting an accounting consultant to assist the city. The consultant's contracts were approved by the City Council and the systems discussed in the column have been installed and are very effective in helping us monitor our fiscal position.

Farrell-Donaldson is an independent and qualified city auditor general. Her staff closely monitored the design and installation of the city's financial systems and has successfully audited the results.

Detroit has taken a national leadership position in the improvement of its financial and management systems. In fact, Detroit, through Green, was honored by receiving the Silver Medal in the Louisville Award competition in 1976 from the Municipal Finance Officers Association, for the development and implementation of the financial information system Taylor is now criticizing.

Paul R. Thompson Jr.
Director

Finance Department
Detroit, Mich.

Code to Have Other Effects

(Continued from Page 23)

the integrity of the nine-digit Zip Code can be assured, either through manual or computerized directory search, then the extended code can be used as a major file sequence.

Because a nine-digit Zip Code covers only two facing block faces — i.e., both sides of the street for one block — the density of names and addresses within that code will be very small. This will significantly reduce the complexity of some of the design problems encountered in computerized file matching.

The extended Zip Code will also make possible the application of detailed census data demographics to computerized files. Although census data is presently available by Zip Code, the five-digit Zip Code does not represent a very homogeneous group of people and, therefore, the data is of questionable value. The very small territory defined by a nine-digit Zip Code is almost certain to be quite homogeneous, and the associated census data will, therefore, be capable of discriminating socioeconomic variation.

Revolution in Direct Mail

The availability of detailed data at this level will revolutionize the direct mail Industry and will provide customer research data for most other businesses.

The implications of the extended Zip Code are therefore much broader than the programming problems that will be encountered in modifying existing systems. Some systems will need to be redesigned, while others will take on entirely new characteristics and will be forced to meet sophisticated new requirements.

Although some delay is to be advised until the implementation of the extended Zip Code is better understood, the magnitude of the changes that will be required in most systems is great enough that procrastination could prove quite expensive.

Loeb is with Neodata Services of Boulder, Colo.

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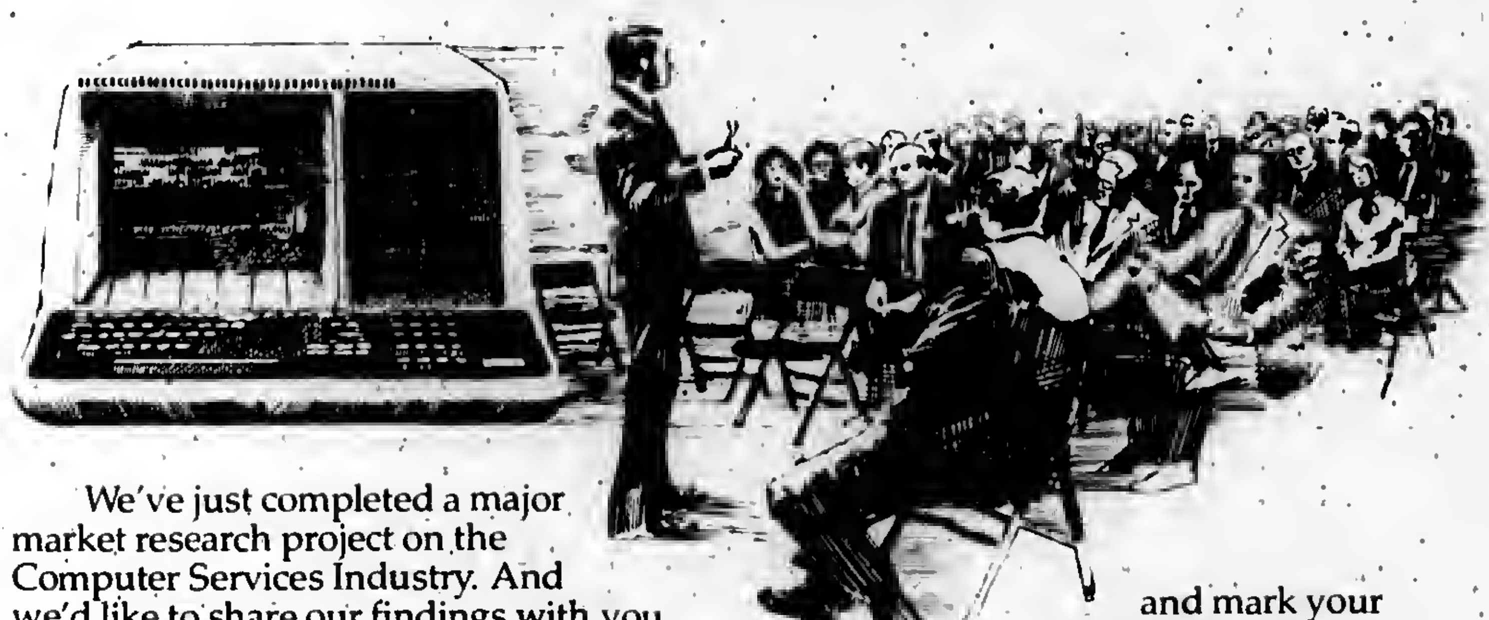

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Two Problems Contributed to Failures

(Continued from Page 23)

out a complaint or two when failure to comply with a contract is evident. If Detroit had checked the complaints the auditor-general knew about in January 1977, a lot of trouble could have been avoided and much money could have been saved.

Martyred Whistle Blower

The second problem, the personnel issue, concerns the impact of a martyred whistle blower on an organization setting out to implement a system. The victim in the Detroit situation is a senior systems analyst who caught the problems while matters were still at the proposal stage. He was subsequently fired.

This occurred so quickly and forcefully that before the users knew enough about the system to object to it, their technical personnel were shown — in no uncertain terms — what would happen if they asked awkward questions.

The analyst concerned was Stuart Egan. In June 1973, he was given the job of working with Arthur Andersen to collect needed user data. Three months later, before the management overview report was published and the departments were told what was in store, Egan was returned to the city as "incompetent."

He was subsequently fired in 1975, won reinstatement, was fired again and is still involved in a running battle to protect his name and the city's interests.

Employee Evaluation

Arthur Andersen's evaluation of Egan shows more about how the firm evaluates its own professional staff than about Egan's three-month stint with the firm in 1974.

In the evaluation, professional and personal attributes are grouped together in an 18-point section. Qualifications included in the list are winning confidence of clients, ability to follow instructions, knowing when to compromise without sacrificing principles, leadership capability and capacity for teamwork.

Other items are perception of need for additional client services; aptitude for associating with others, appearance and poise, tact and common sense, willingness to accept responsibiilty, initiative and cooperation. The remaining qualifications include ability to perform under pressure, decisiveness, self-confidence, attitude, maturity and integrity, which includes "frankness" when dealing with others."

Independence, the crux of professional responsibility, is not mentioned. The closest thing to it is the very last point at the end of the list, integrity.

Many of the professional points listed such as skill at teamwork, ability to follow instructions, getting along with clients and marketing ability are in direct contrast to the capacity to stand up and maintain professional independence.

Note the stress on deferring to others, to clients, supervisors and so forth. This emphasis may result in professional "yes men" unable to stop the implementation of questionable projects.

News Got Around

After Egan was kicked out by Arthur Andersen, the news got around. He had been known in city circles as the "only competent person knowledgeable in all aspects of the [city's] accounting procedures." He had worked with the user departments for years.

If Egan could be discarded so quickly, how could other persons, particularly users, risk more than token opposition?

As I see it, Egan's firing has served as a smokescreen behind which Arthur Andersen can hide from questions about its 1973 activities.

The firm said Egan's charges had been found by the Federal Bureau of Investigation to be "without foundation," when the FBI specified that it had only looked into federal violations. Furthermore, Arthur Andersen described Egan as an "ex-employee" and asked for "skepticism," before his charges were even considered before the public.

Arthur Andersen and the city of Detroit failed to appreciate the importance of Gigo and also failed to supply technical personnel policies to encourage professional independence. When a computerized system is introduced into this kind of environment, downstream problems are invited.

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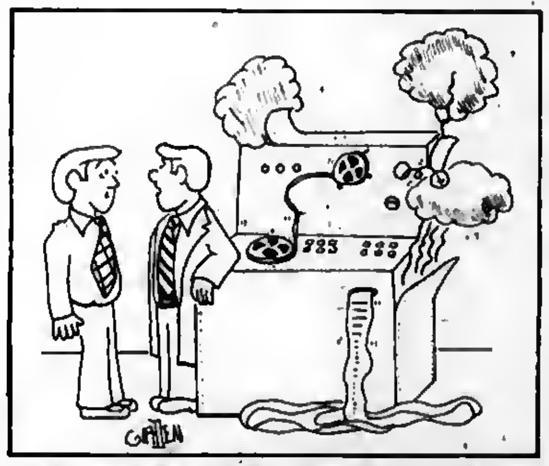
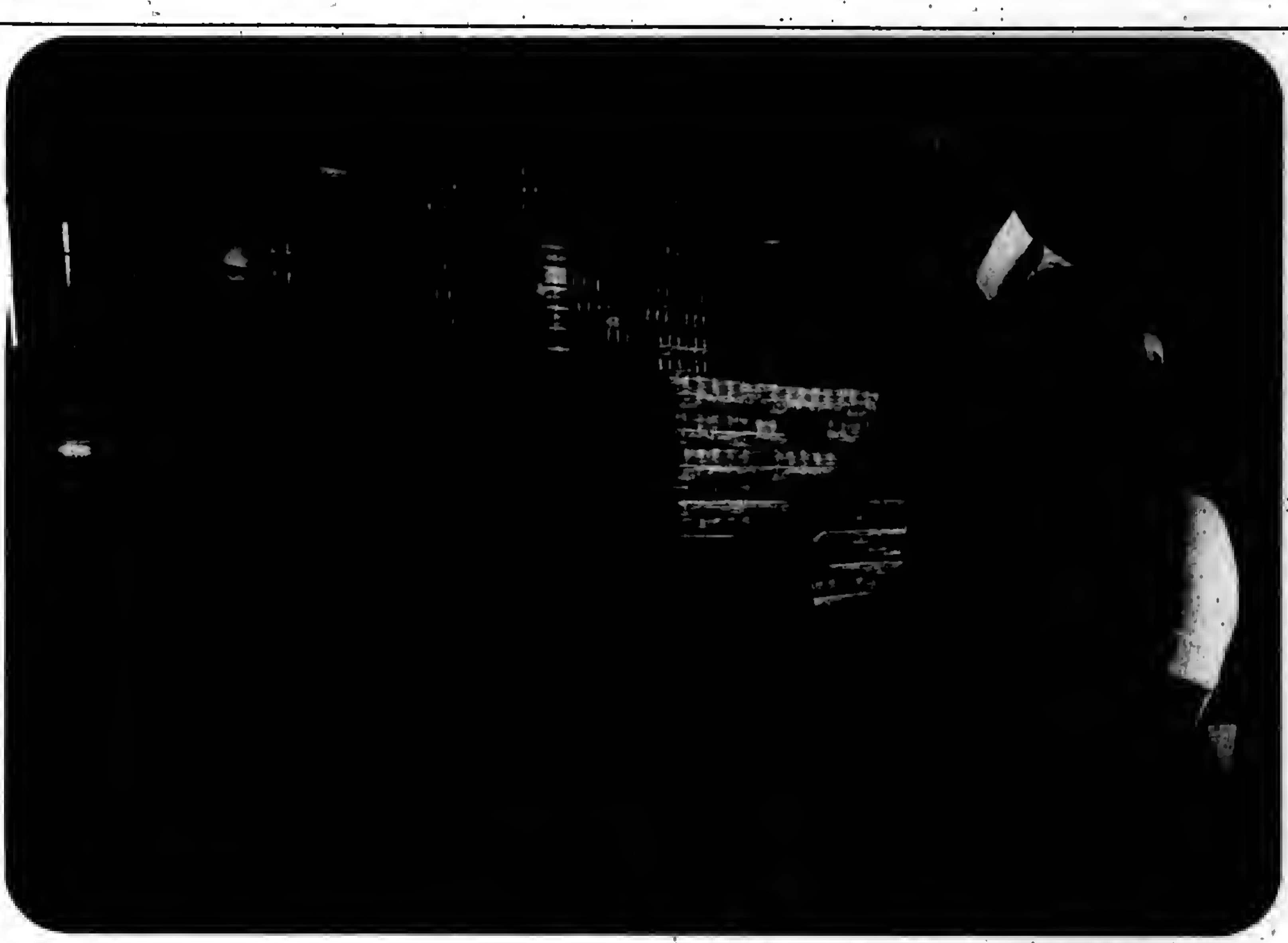


'It's Worse Than Built-In Obsolescence; It's Going Through a Mid-Life Crisis.'



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Potomac Peddler Ponders Puzzle

By Don Leavitt
CW Staff

McLEAN, Va. — IBM-oriented installations that can buy from the Federal Supply Schedule are a puzzle to one of the vendors on the list: Few seem to realize the vendor has a software package it will give them for the asking.

The vendor is Pansuphic Systems, Inc., and the package is Panvalet, the source statement library system that works under DOS, OS or VS on IBM 360 and 370 or compatible CPUs. Panvalet has earned a place on Datapru Research Corp.'s Software Honor Roll for several years.

For the past 10 months or so, qualified agencies haven't even had to pay for the software, yet Pansophic has given away very few copies "and that puzzles me," a spokesman said.

The current situation arose from an agreement signed with the government in the early 1970s, he explained. Under that pact, Pansophic agreed to provide the software free to any other qualified organization once "either X number of copies had been sold at the Schedule cost or sales reached a specified dollar volume; I don't remember which," he said.

In either case, the breakpoint was reached near the beginning of 1978 and Pansuphic has been trying to spread the word that Panvalet is now available to any agency that doesn't have it yet — free, no strings attached.

The software being distributed under this plan is the latest version of Panvalet, and installations are provided with six copies of the documentation, "which is more than we normally give our civilian customers," the spokesman noted.

Available to Many

A broad spectrum of installations have the right to acquire items through the Federal Schedule. These include not only federal agencies, but state, county and municipal facilities as well, along with contractors doing work for any of the qualified organizations.

The problem Pansophic has in giving away Panvalet may be that agencies are suspicious of anything that is free, but that really shouldn't be a factor In this case, the spokesman said. Any copies distributed now aren't really free — "They're prepaid," he pointed out.

But government regulations and rules may be a problem, he acknowledged: "Agencies don't like to prepare purchase orders for nothing." When that is the basic hinderance facing an installation, the interested user is urged to contact Pansophic and a different documentation, acceptable to the agency, can be prepared.

There may be costs involved in the acquisiton and continued use of Panvalet under the General Services Administration's plan, but they involve only those agencies that want help on the installation of the software or ongoing maintenance and support. Installation and training help costs $500. The annual maintenance fee is $850 for OS, $750 for DOS.

Pansophic's Federal Systems Office is at 1651 Old Meadow Road, McLean, Va. 22102.

Package Turns Back Threat of Reruns

By Chuck Pearce
Special to CW

HOUSTON — Foley's, a division of Federated Department Stores, is one of the oldest and largest department stores in Houston. Its DP shop does all the batch processing (more than 8,500 jobs per month) for eight area stores.

The shop processes general ledger, accounts receivable, payroll, and supply and inventory as well as on-line applications such as credit management, credit authorization and a "big ticket" furniture inventory system. It also has all stores on-line with point-of-sale activity.

With all of this activity, one thing Foley's doesn't want to worry about is reruns. Reruns, of course, mean a loss of time and a scheduling disadvantage. They also add unplanned resource requirements to the processor schedules, which could result in loss of on-line availability.

But reruns can be controlled; they don't have to control the DP shop. Attaining this control requires a two-phase approach:

- Determining the major causes of reruns and eliminating them.
- Processing the reruns that are inevitable in the most efficient manner.

Foley's has successfully attacked the front end of the rerun problem — the causes of reruns — with ongoing tracking of the causes and the institution of policies and procedures to control and reduce the number of reruns. The findings show reruns occur because of input errors, application program exceptions and computer operation errors, but the major source of reruns is hardware.

Hardware trends are analyzed on a daily and weekly basis, and regularly scheduled meetings are held with the hardware vendors. All areas of the DP staff are involved.

The operations, applications and systems groups from Foley's meet with the sales engineering and technical support groups from the hardware vendors. A

(Continued on Page 28)

'Maximus' Builds DG Programs

BUFFALO, N.Y. — Maximus from Collective Computer Marketing, Inc. has been described as a multidimensional source code program generator that produces structured programs in virtually any standard programming language. It has been used extensively to generate Cobol and PL/I, a spokesman said.

Developed by Maximus Systems, Inc., the software was originally intended for large-scale systems. Although it still functions in that environment, it is currently operative on Data General Corp. CS and Eclipse minicomputers as well, the spokesman claimed.

In its latest setting, Maximus is capable of generating interactive Cobol under Icos; commercial Eclipse Cobol under DG's Infos; and DG's Interactive Data Entry Application (Idea) FPL code, also under Infos. The generated code "fully utilizes Infos' file management structures," the spokesman said.

Maximus is even capble on generating source code for IBM-based applications on standard DG systems, he continued.

The software works from "fill-in-the-blanks" types of forms "that virtually eliminate missed parameters," and the entry work is done on-line through CRTs. Users are supported in this effort by option menus, the spokesman noted.

Maximus is said to rely on the philosophy that good programs should be copied and that programmers shouldn't waste time redoing what has already been done. The generator builds its source code from what amounts to an internal library of miniature program structures, based on the individual user's entries on the CRT.

Maximus costs "about $15,000" for use on DG's CS line of minicomputers, plus a charge of "less than $100/mo" for maintenance, starting from the date of initial acquisition, and $1,000 for each langauge beyond those included in the base packaging.

The generator software requires less than 12K bytes of memory on a CS unit, Collective said from 3527 Harlem Road, Buffalo, N.Y. 14225.

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LYONS, Ill. — Special 1 is a general-purpose utility designed to provide most of the functions of various IBM standard utilities as well as many functions not available elsewhere, according to its vendor, General Electronics.

The software will copy, dump or print any data set that can be processed by Qsam, including both sequential and partitioned formats, a spokesman said. It accepts fixed, variable or undefined records in any record form or block size acceptable to IBM's OS, he added.

Special 1 also provides blocking, deblocking and conversion to or from undefined or variable formats, based on specifications contained in the DD card or data set label.

The program can produce as many as four sequential data sets or members under control of DD statements. Optional printed output can be created based on the presence of other specific DD statements.

The printed outputs include a character-formatted dump, a vertical hex dump and a vertical dump similar to the hex routine but in an octal representation, which the spokesman said is useful for printing files from a 6-bit machine.

Special 1 can work with files written in Ebcdic, Ascii, Burroughs Corp. or Honeywell, Inc. 400 or 2000 series codes. It costs $1,995 from General Electronics, P.O. Box 79, Lyons, Ill. 60534.

'UCC Fifteen' Eases Worry Of Reruns at Retail Chain

(Continued from Page 27)

fixed agenda for the meetings is set and includes a discussion of any problems that have occurred since the last meeting.

A portion of every meeting is devoted to planning. These sessions are supplemented with at least one full planning session during the year. Here, the next 12-, 18- and 24-month objectives are laid out. On the programming and data entry side of the rerun question, Foley's continually tries to identify the causes of problems, especially the repetitive causes, and to eliminate them through programming changes where applicable.

The problems on the operations side are addressed through education, improved scheduling and automated job control procedures. Production JCL and Procs are maintained in libraries with very limited access. The goal has been to build a pyramid of libraries that would have production control totally on-line and under tight security.

Automatic Restart

Under both DOS and OS, the back end of the rerun problem — how to handle the rerun — has been approached in the same way. In both environments, Foley's has installed an automatic restart system.

When running under DOS/VS, an in-house restart manager was written to eliminate the time-consuming and error-prone procedures which were necessary to handle reruns in that environment. Foley's had established job and procedure libraries using IBM's Power/VS and Epat from SDI, Inc.

Previously, the initiation of a rerun required punching cards for the pertinent library members in order to set up a rerun deck. After the deck was punched, someone would change some of the cards, add some and eliminate some to build the proper rerun stream.

The restart manager package was able to eliminate this card punching and jobstream building process and allowed the staff to keep all the Proc and JCL decks constant. With the restart manager, the inclusion of a single card was all that was necessary to instruct the system to the steps necessary for the rerun. Thus the rerun was accomplished without any card punching.

More Complex Challenge

When Foley's went to OS, the rerun challenge continued, but in a more complex environment. The front-end solutions to the causes continued to be applicable and sufficient. But the restart manager, which was the back-end solution under DOS, was not designed to handle problems unique to OS.

The reruns encountered under OS confirmed that there was a definite need for a restart manager. Writing one for OS would have taken too much time and money. That was when Foley's looked at vendor packages.

University Computing Co.'s UCC Fifteen was chosen, since it was just about the only package on the market that would fulfill Foley's requirements.

UCC Fifteen has helped by resolving the bias number adjustments for generation data groups and by resolving other problems on the OS catalog — namely, the uncataloging and scratching of files that are to be recreated during the restart or rerun.

In addition to giving job control support, UCC Fifteen interfaces with Foley's tape management system, UCC One. Under OS with UCC One, there are two catalogs for tape management, the standard OS catalog and the UCC One Tape Management Catalog (TMC).

The UCC Fifteen restart management system addresses both of these catalogs simultaneously. Tapes that are to be re-created during a rerun are uncataloged from the operating system catalog, and the tape expiration date in the UCC One TMC is changed to the current date so it may be scratched.

Pearce is group manager of opertions at Foley's DP center in Houston.

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Package Aids Plotting on PDP-11

APPLETON, Wis. — A plotting package written for Basic Plus use on Digital Equipment Corp. PDP-11s linked to Tektronix, Inc. 4010 series terminals, TSP-12 analog plotters or character-oriented terminals is now available from Lawrence University.

The package is made up of compact, versatile and coordinated sets of subroutines supporting fundamental plotting operations through mnemonic entry points which can be extended by attaching another subroutine if the user wants to draw character strings, a spokesman said.

The Lawrence facility is distinguished from other plotting routines for Basic Plus use by its device independence, its small size and its deferred plotting capability, he claimed.

Device independence means that once completed and tested using one plotting device, a user's driving program will produce the same display with a different device merely by appending the appropriate set of subroutines, the spokesman asserted.

The subroutine for each plotting device requires less than 4K words of memory. Memory overflow is rare even on an RSTS/E system that limits each user to 8K words, he said.

The package costs $400 for commercial users, $250 for nonprofit organizations and $150 for educational institutions, the spokesman said from the Computer Center Publications office, Lawrence University, Appleton, Wis. 54912.

'Filetab' Available for Larger ICL 2900s

MANCHESTER, England — Level 5 or 6 of Filetab, a parameter-driven report writer from the National Computing Centre; already implemented on IBM 360 and 370, Univac 1100 and ICL, Inc. 1900 and small 2900 systems, has now been installed on ICL 2960 and larger CPUs under VME/B as well, a spokeswoman said.

To ease conversion from 1900 Filetab to the 2900 version, a syntax checker is supplied which may be used to determine that programs have been converted correctly and will "compile" without error on the larger mainframes, the spokeswoman noted.

The package utilizes decision-table logic to create application programs far quicker than they could be written in Cobol, she said, adding that Filetab operates as a "load-and-go" system so users also avoid the time required for conventional compilation.

Capable of processing 17 I/O files — which may be any combination of sequential, indexed sequential, Cincom Systems, Inc.'s Total or user-defined structures — Filetab includes an internal sort. A report generation facility supports eight control levels and 32 totals within each level.

The ICL 2900 version, ready for distribution now, costs from 4,000 to 6,000 pounds sterling.

Agency arrangements are under negotiation for the U.S. market, and details of those negotiations may be available in the next few weeks, the spokeswoman concluded from the National Computing Centre, Oxford Road, Manchester MI 7ED, England.

C Ready for DEC Users

NEW YORK — A compiler for the programming language C has been introduced by Whitesmiths Ltd. for use on Digital Equipment Corp. PDP-11 minicomputers.

Versions of the compiler are available for DEC's RT-11, RSTS/E, RSX-11M and IAS settings and for Western Electric's Unix operating system. The package includes a run-time library of utilities and I/O routines, a spokesman said.

The compiler operates in three sequential passes and can replicate itself in 16K words of user space under Unix. It can do the same on DEC LSI-11 microcomputers with 20K words of user memory and one disk drive, he added.

All facilities of C are supported, including bit fields and defined types which are not implemented in the C compiler provided with the standard Unix system, the spokesman noted. The runtime library is more complete and systematic than that described in Kernighan and Richie's *The C Programming Language*, he claimed.

A perpetual binary license for use of the compiler on a single CPU costs $500 plus a charge for delivery media, the company said from 127 E. 59th St., New York, N.Y. 10022.

'Pashal' Backs Oil Companies

DALLAS — As a real-time petroleum accounting system from Hal Systems & Services, Inc., Pashal provides oil and gas companies with a spectrum of support on Datapoint Corp. hardware or on a remote service basis, a spokesman said.

The applications included in the software cover general accounting control, accounts payable, joint interest billing, income distribution and lease operations management and payroll, he noted. A separate but integrated system provides land-lease records management.

Pashal is written so it can support a small petroleum accounting operation on Datapoint 4540 or 4530 equipment. On the other hand, Hal uses the software in its service bureau business on a Datapoint Attached Resource Computer (ARC) configuration.

Modular in design, the system can be installed at a user's site for $20,000 to $50,000, depending on required capabilities, the spokesman said, from 11520 N. Central Expressway, Dallas, Texas 75243.

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On DG, DEC Minis

DBMS, Programs Aid Factories

SANTA MONICA, Calif. — Users working with Data General Corp. or Digital Equipment Corp. minicomputers have been offered a "mainframe-like" data base management system (DBMS) and application software for a variety of functions, all from Disc/310 Corp.

The DBMS supports fully inverted file structures and allows users to create and modify files, screen formats, prompting menus and output reports without changing application programs, a spokesman claimed.

The application software, built to utilize the facilities of the DBMS, support material requirements planning (MRP) and other manufacturing applications, distribution and accounting functions and word processing or text editing, he added.

The distribution and accounting programs include open order entry, invoicing, credit analysis, commissions, multiple pricing schedules, accounts receivable and inventory management, the spokesman said. The software also includes sales analysis, accounts payable, payroll and personnel recordkeeping and purchase order control.

The manufacturing applications include, in addition to a time-phased MRP, work-in-progress and production control, a bill-of-materials processor, support for engineering change orders and part number cross-references.

The logic for quotations and bids, budgets for labor and materials, historical costing information, purchasing/receiving/inspection of materials and comprehensive job costing are also part of the manufacturing support, the spokesman said. This range of programs, like the general accounting packages, are all integrated into a general ledger system, he noted.

The DBMS is said to invert or index on any field in a file and to access indexed fields across multiple files. It also keeps screen formats and data definitions independent of application programs, the vendor said.

The DBMS costs $10,000; the distributors' accounting routines, $20,000; and the manufacturing applications: $30,000, with MRP and the word processing modules sold separately for $5,000 each.

The company is at 1840 Lincoln Blvd., Santa Monica, Calif. 90404.

Sharp Adds Telex Entry

TORONTO — I.P. Sharp Associates Ltd. has made its remote computing services accessible through the worldwide public Telex network in addition to continuing access by local telephone calls whenever the user is near a Sharp branch office.

Sharp currently provides telephone dial-up access in more than 225 cities worldwide, but the Telex connection expands that service range to countries and geographic areas in which Sharp itself is not yet established. It might also relieve a user's phone lines of data traffic if that has become a problem, a spokeswoman noted.

Although Sharp's services are APL-oriented, much of the user interface with programs in the company's library do not require transmission of APL characters. In those cases, the Telex units will serve the user well. For those who wish to write programs in APL, however, the Telex facility "is not recommended," the spokeswoman stated.

There is no increase in connect time or system use charges through the Telex facility, but users are responsible for Telex charges, she said. Sharp currently provides two Telex access points — Rochester, N.Y., and Amsterdam, The Netherlands, she added.

I.P. Sharp is headquartered at 145 King St. W., Toronto, Ont. M5H 1J8, Canada.

'Ambase' an Interactive DBMS

LOUISVILLE, Ky. — A data base management system (DBMS) that enables users of Digital Equipment Corp. PDP-11 minicomputers to update files interactively, Ambase from Amcor Computer Corp. also allows changes in the file structure to take place without impacting application programs, according to a spokesman.

The data independence is provided, as with most DMBS, through the use of a data dictionary, he explained.

To speed report generation, Ambase allows 42 dynamic sorts to be maintained for any "logical system," the vendor's term for a data file under Ambase control. There can be 295 logical systems in an Ambase implementation, and each can contain 4.3G bytes of data in three different record formats.

Run under DEC's RSTS/E environment, Ambase can be accessed by a number of users concurrently, but a system-generated lock at the field level prevents multiple users from performing simultaneous updates on the same data, the spokesman noted.

The software supports 100 bytes of comment space per field, he added. This can be used to create prompting messages for easier data entry or other functions.

Ambase can be installed in a 16K-byte partition. It costs $12,500, Amcor said from 1900 Platside Drive, Louisville, Ky. 40299.

JES3 Course Set

TULSA, Okla. — A five-day intensive course on the "externals" of IBM's Job Entry System 3 (JES3) will be presented here Dec. 11-15 by Computer Systems Research, Inc. (CSR).

The $765 course is intended for technical supervisors, system planners, operations personnel, trainers and programmers, a CSR spokesman said from 195 W. Main St., P.O. Box 45, Avon, Conn. 06001.

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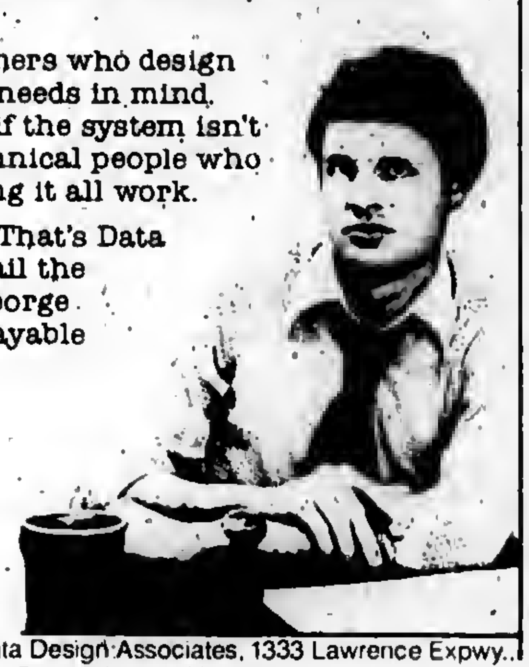

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A Good Prescription?

Actual Benefits Justified Early Move to DBMS

**By Edward Seaman
And Martin Kral**
Special to CW

PALO ALTO, Calif. — In 1969, the year when a data base management system (DBMS) was first introduced, Syntex, Inc., a pharmaceutical research and manufacturing company here, brought in $108 million in gross revenues. In the last financial year, gross revenues amounted to $380 million, a figure expected to triple by the mid-1980s.

The complexity of corporate structure has also increased significantly. Today the company is highly diversified, expanding in part by purchasing smaller companies. As these companies are acquired, they must be integrated with the corporate information system.

Hardware has expanded with the increased DP task, from an IBM 360/40 to the current IBM 370/158. However, the best measure of the changing requirements can be seen in the data base.

In the nine years of DBMS use, it has grown to contain hundreds of different record types and many separate data bases. Many of these data bases contain 25 or more interrelated record types.

Decision for DBMS

The decision to use a DBMS was made for several reasons. Applications were arising that were unsuited to the existing sequential files. Also, Food and Drug Administration (FDA) requirements were increasingly demanding. Programmers were faced with the specter of maintaining a bewildering myriad of pointers.

Since it was apparent that the data base would be continually evolving, a high degree of data independence (the ability to alter data structure without impacting applications) was required. Total, the DBMS from Cincom Systems, was selected as best suited to these needs.

In early 1972, a complicated quality control system and a standard order entry system were in place. Quality control in the medical drug industry requires extensive tracking and historical analysis of products. FDA requirements impose stringent procedures and corresponding structures.

Without a DBMS, these systems would have been difficult to develop. At that time, however, Syntex's data base had not yet been subjected to the rapid growth that was to soon follow.

Many Syntex applications had been on-line from the beginning of DBMS use. In mid-1972, the decision was made to move from a home-grown teleprocessing (TP) monitor to IBM's Customer Information Control System (CICS). At this time, TP support packages were not as common as today, and Syntex found that the DBMS could be used to develop general-purpose mapping and data entry utilities.

Complex Recovery

Recovery in an on-line environment was much more complex than in a batch environment, and warm restart programs were developed to replace the previous cold restart logic.

Thus, by early 1973, the data base/data communications environment had been securely established. Programmers had become familiar with the DBMS and TP monitor.

It was at this time that Syntex embarked on its data base "boom." There appear to be two features of the DBMS which facilitated this:

- Because of the high degree

(Continued on Page 32)

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'In?uiry/IMS' Backed

WOODLAND HILLS, Calif. — Annual Improvement Maintenance and Support (Aims) service is now available to all users of the In?uiry/IMS package, according to a spokeswoman for Informatics, Inc., which recently took over the package from its developer [CW, Sept. 25].

For a yearly fee, Aims provides system releases, error analysis and correction support and system modifications are released between full-dress system updates, she said.

Announcement of Aims availability for In?uiry/IMS means the company has people in place, in the field and at headquarters, to provide support.

Aims service for In?uiry/IMS — after the first year, when it is free — costs $4,000/year, she added from 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Drug Company Finds DBMS Use Good Cure for Growing Pains

(Continued from Page 31)

of data independence of the DBMS used, expanding a data base is usually an easy matter. In fact, no full-time data base administrator (DBA) position was created until a year ago.

It is sometimes claimed that since the DBA is an expert, his task can be arbitrarily complex. The complexity of the DBA task generally increases with complexity of data base structure.

Consequently, if an organization envisages building a data base with extensive structure, it is advisable to ensure that the DBA task will always be within reasonable constraints.

- The ease of use of the DBMS for programmers was another critical factor. Increasing a structural complexity of a data base should not produce a disproportionate increase in analytical thinking when programming.

Not for Programmers

For example, space management should be out of the programmer's hands, handled entirely by the DBMS. If this is otherwise, new relationships will create additional program write and debug time.

In short, the fact that the DBMS used is a high-level "black box" has greatly facilitated data base structural growth.

Given the ability to respond relatively promptly to user requests, demands for services also increased. Syntex has a large and active scientific research group that is in constant need of new and improved systems.

At the same time, Syntex has been assimilating companies with different information organizations. The last five years have consequently brought a continual expansion of the corporate data base, until today it contains some 355 record types within 28 separate data bases.

The DBMS on-line work load has also increased — from about 40,000 data base accesses per day in 1972 to between 250,000 and 500,000 per day at present.

In the future, Syntex envisages an ever-increasing integration and expansion of its data bases as the company continues to grow and diversify. Systems will be made more user-oriented, particularly in the research, manufacturing and corporate management areas, providing more direct data access.

At the same time, the DBMS will provide the flexibility necessary to successfully provide for continued corporate growth.

Seaman is supervisor of systems and Kral is a data base analyst at Syntex, Inc. in Palo Alto, Calif.

The interactive database system that helps a space-minded company hold costs down to earth.

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Lockheed's first Model 204 project involved the transfer of a system that controls large volumes of cost-estimating statistics. Model 204 not only handled the data, but also put it within easy reach of all types of people—from computer experts to clerks.

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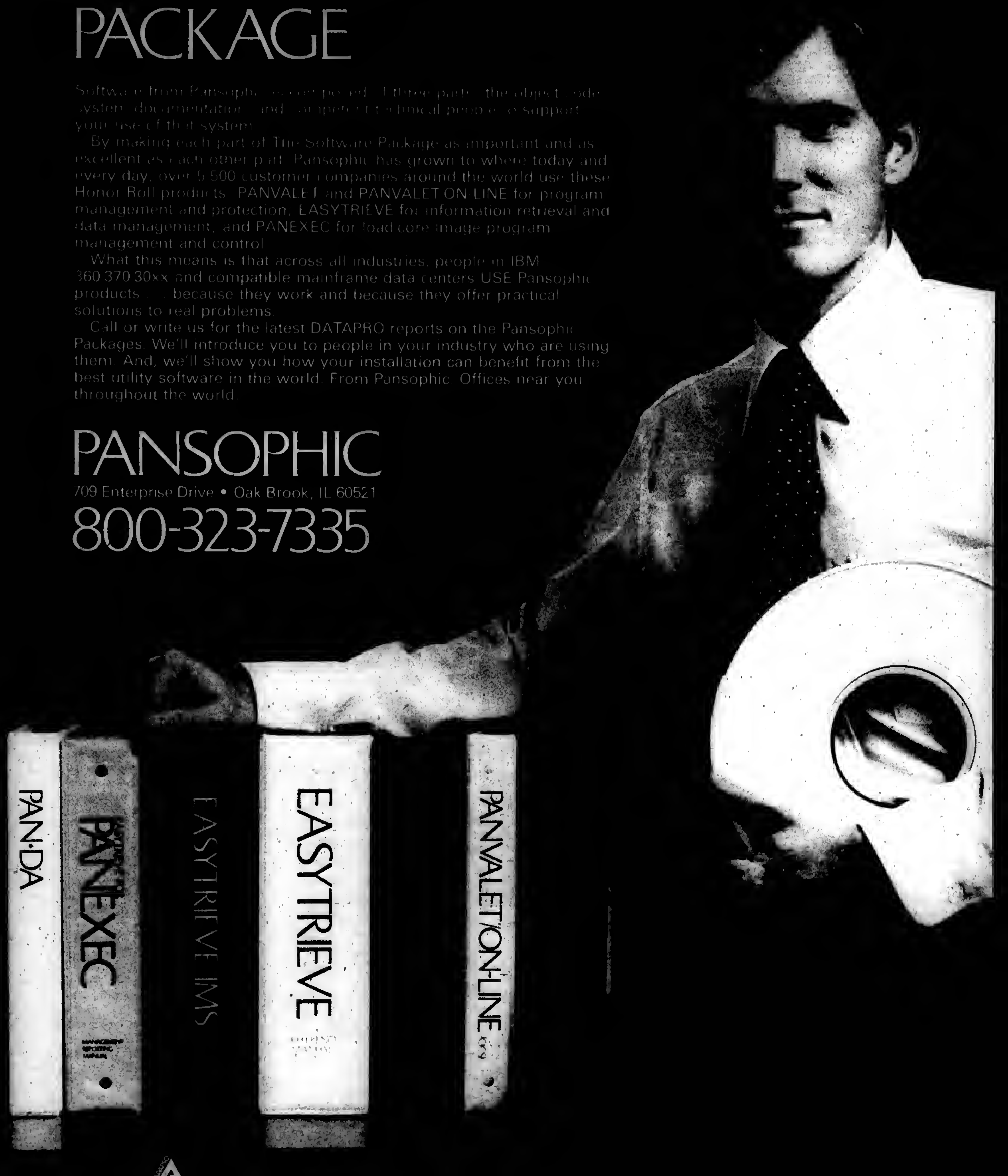


IBM Aids Personnel Work

WHITE PLAINS, N.Y. — A terminal-oriented system unveiled by IBM is said to be able to help users store, update and secure vital personnel information by using three interrelated and expandable data bases.

The software was designed for IBM 370s functioning under IMS/VS, CICS/OS/VS or CICS/DOS/

The Interactive Personnel System reportedly provides required personnel functions as well as facilities that allow nonprogrammers to define personnel-related applications. Data is stored in common data bases that can be customized to an organization's requirements, and an on-line inquiry and update feature allows rapid access to personnel files, according to a spokesman.

A procedure definition language permits the personnel department to specify system editing functions, to check that entered data conforms to predefined formats and to perform various other basic functions, the spokesman stated.

Data security features such as a user identification code, procedure execution and definition authority, data access codes and a password change procedure are also incorporated into the IBM package, he added.

The license fee is $1,100/mo for IMS/VS and CICS/OS/VS users and $800/mo for CICS/DOS/VS systems.

'Tel M' From Independent Eases 'Total' Operations

GREAT NECK, N.Y. — IBM-based users may work directly with data sets controlled by Cincom Systems, Inc.'s Total data base management system through CRTs running with CICS/VS and the Tel M interactive utility package from Labyrinth Systems, a spokesman said.

Tel M enables the user to add records to existing Total data sets, delete invalid or obsolete records, change "anything from a single byte to a complete record" within a data set, reestablish linkage chains to data sets or validate the structural integrity of any data set, he recounted.

In addition, the Tel M user may also delete linkage to bad records, find and selectively display records and handle a range of other file maintenance functions, all through simple commands on a CRT, the spokesman continued.

Records are displayed on the screen in character and vertical hexadecimal format. Bytes may be changed by moving the cursor directly to a specific byte, and the change may be made in either character or hex form, he said.

An alternative, special function screen is used to initiate data base searches, to mark fields in order to locate them on the record screen and to obtain file data. A third screen lists all the elements that are defined in the data base generation; it lists the length of each and its starting byte, relative to the beginning of the record.

While extensive searches are supported — indeed encouraged — by Tel M, the software also includes logic to prevent "runaway searches" that would affect response time for other transactions, the spokesman noted.

Some of the Tel M functions may be controlled by program function keys on the IBM 3270 but if the user's unit does not have that feature, Labyrinth's software will simulate the function.

Tel M installs under OS/VS and costs $5,500, the vendor said from 17 Barstow Road, Great Neck, N.Y. 11022.

Package Backs Banks With NOW Accounts

OAK BROOK, Ill. — The Demand Deposit/Credit Reserve system from Weiland Computer Group has been enhanced to process interest on demand balances in Negotiable Order of Withdrawal (NOW) accounts.

The updated system, designed to run on IBM 360/370 equipment under DOS, is said to feature comprehensive accounting options such as four user-defined interest rates, variable interest accrual methods and a service charge waiver capability.

The basic package integrates demand deposit account processing with extensive commercial account analysis, credit reserve management and account reconciliation, the spokesman noted. It handles savings-to-checking transfers; descriptive, combined statements — in check number or date sequence; and overdraft interest charging, he added.

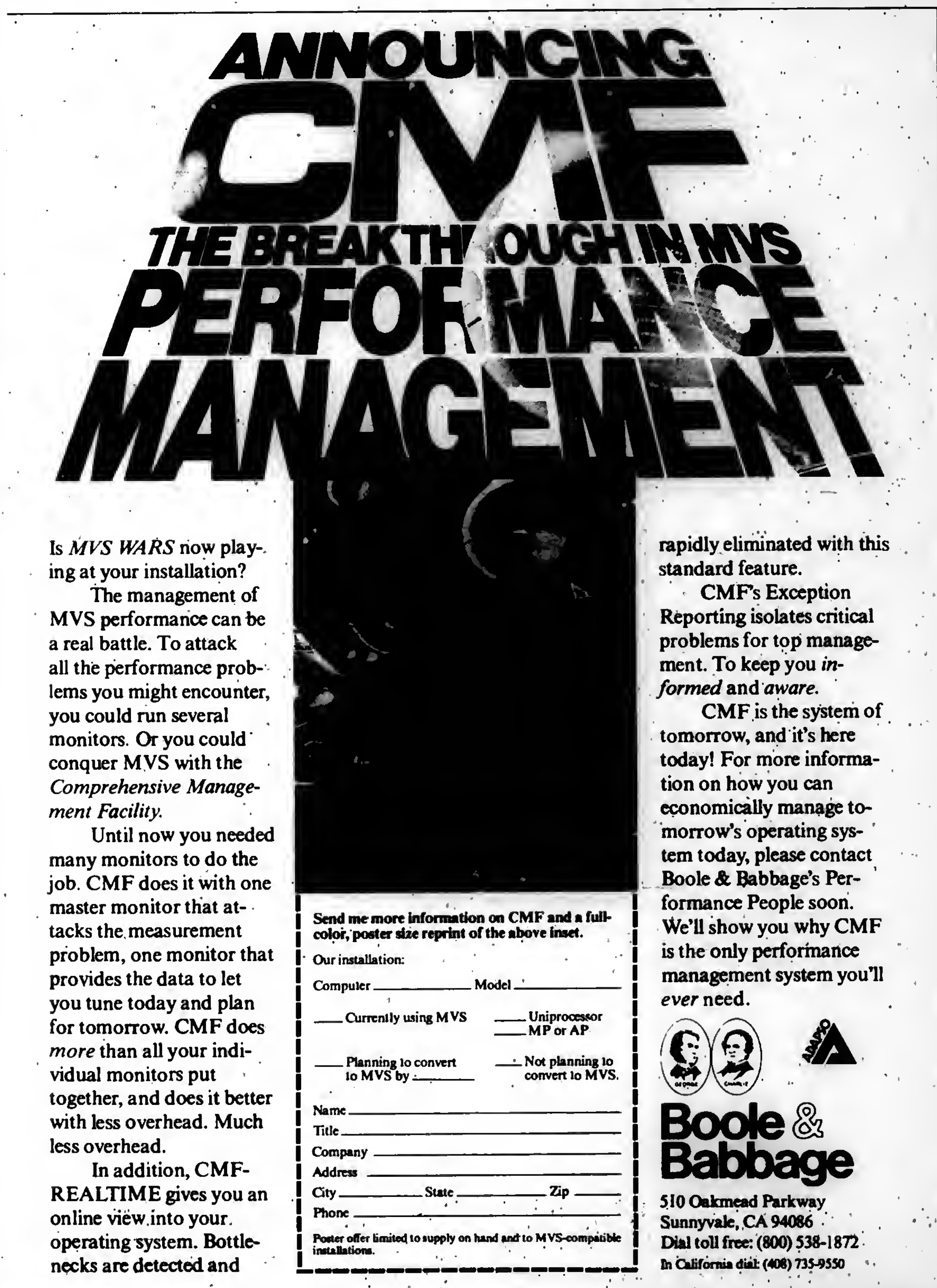
The NOW support includes a number of operational, government and customer reports. Bank and branch reports are generated daily, along with a journal reporting on the current status of the interest on demand service, the spokesman said.

The system also produces Internal Revenue Service interest reports and "complete customer reports" showing interest calculations and interest earned yearly, he continued.

Originally a batch system, the Weiland package is also available online under IBM's CICS.

Currently, the software costs $45,000 (DOS) or $59,000 (OS) for the batch version, plus $15,000 (DOS) or $22,500 (OS) if the on-line implementation is wanted.

Optional account reconciliation support costs an additional $9,000 (DOS) or $10,000 (OS), Weiland said from 1515 W. 22nd St., Oak Brook, Ill. 60521.



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By Ronald A. Frank
CW Staff

CW Photo by R. Frank

Ken Russell, computer communications tester at the Datapac National Data Control Center, monitors the network's status. The board on the wall lists the diagnostic software installed at various control points in the network.

OTTAWA — Packet-switched network technology is best for transaction-type traffic, but there may be limitations to mixing voice and data on this type of system, according to Andrew M. McMahon, vice-president of the Computer Communications Group at Bell Canada.

The switching associated with a packet network is cost-effective for data because this type of transmission has gaps during which the switching can be performed. Voice traffic does not, McMahon explained during a recent interview.

Datapac is the packet network offered in Canada and it is one of the pioneering nets of this type. Datapac was planned before the CCITT X.25 packet network protocol was finalized, but the Standard Network Access Protocol (Snap) that was implemented later proved to be very close to the international standard.

About 900 terminals are now operating on Datapac, according to McMahon, and the number is growing. The devices supported by the network provide a broad range of compatibility for Canadian users.

Three Types of Service

Datapac currently offers three types of service, McMahon noted. The 3101 service supports asynchronous teletypewriter devices using a Network Interface Machine (NIM). Low-speed asynchronous terminals are supported through an Interactive Terminal Interface (ITI).

The 3201 service on Datapac supports buffered, pollable asynchronous terminals using the International Standards Organization's poll/select asynchronous transmission line protocol. Included in this category are the NCR Corp. 280 and 125 point-of-sale terminals and TRW, Inc. 4234, 4235 and 4236 Ascii credit verification units. The 3201 service typically operates on 1,200 bit/sec multidrop lines.

The 3203 service supports buffered, pollable, asynchronous terminals using an enhanced version of the IBM 2740 Model II transmission line protocol. These terminals are linked to the Datapac network using NIMs.

The first terminal supported by Bell Canada and other carriers was the Data Measurement Corp. Model 8901 buffered teletypewriter. Access to the 3203 service is via 1,200 bit/sec multipoint, multidrop facilities.

Support for 3270 Planned

Support on the packet network for IBM 3270-type synchronous terminals is slated for the first quarter of 1979, McMahon said. This service will allow binary synchronous terminals, such as the Vcom 2 offered by Canadian phone companies, to operate on the Datapac network.

Designated the 3303 service, the 3270 support will poll these terminals using Binary Synchronous Communications (BSC) line protocol. Host CPUs at the customer site will operate with the Datapac Modified Emulation Program (DMEP) software developed by Cambridge Telecommunications Corp. (CTX).

In the third quarter of 1979, Datapac service will be further expanded with support for multileaved Hasp workstations of the IBM 360/20 type. This service will probably be designated 3304 and will also support units made by Data 100 Corp., Datapoint Corp. and other vendors.

Even though the network supports such a diversity of terminal devices, McMahon said it is not the intent of the Trans-Canada Telephone System to offer DP-type services. "We will enhance the user's ability to move data without changing the contents of the message," he explained.

In addition to its domestic offerings, Datapac has direct connections to the U.S. Telenet and Tymnet packet networks. This means Canadian and U.S. users can access terminals and CPUs on either side of the border.

By 1981, McMahon said, a digital circuit-switching capability will be introduced for high-volume data traffic between multiple locations at high speeds. With this type of digital circuit switch available, it is possible integrated voice and data service could be offered on Datapac.

At this time, however, the inclusion of voice capability on the Datapac network is not a high-priority item, McMahon said.

Monitoring Center

One of the key elements of Datapac operations is the National Data Control Center at Bell Canada here in Ottawa. The center is the focal point for 60 control centers located at various points in the net that continually monitor operations.

Network status is displayed on three CRTs that list the quantity of packets transmitted on a link, the numbers of alarms registered by the Digital Equipment Corp. PDP-11 minicomputers and network analysis data.

Datapac monitoring points were scanned twice each second and, in many cases, faults are detected which are not enough to interrupt service. In one case a 1.54M bit/sec data link between Montreal and Toronto registered 173 line hits of less than .5 sec each.

The line hits were not enough to interrupt service to users of the link, but their discovery gave notice and to the national control center that it might be necessary to switch to backup facilities before the trouble escalated and affected data streams.

The network philosophy is to spot malfunctions before they become serious, McMahon explained. Although data traffic is still a small portion of the communications handled by Bell Canada, it is growing at the rate of 25% per year. As the data needs of users grow, new services will be offered on Datapac to meet the demand, he added.

Efficiency, Cost Savings Sell Store on Use of POS Network

Special to CW

ROCHESTER, N.Y. — A network of point-of-sale (POS) terminals has allowed a department store here to cut costs and improve efficiency in a number of DP applications.

Sibley, Lindsay & Curr installed a network of 589 Datatrol, Inc. RS-6000 POS terminals about two years ago, linking 60 company departments at nine locations to three Digital Equipment Corp. PDP-8 minicomputers.

The most tangible benefit of this network has been a reduction in data collection overhead, such as payroll costs, according to Fred Zinsser, Sibley's DP director. For example, the "back-office staff' has dwindled from 27 people to 14 in the audit area; merchandise control personnel are down from 15 to three; and the data entry staff has been pruned from more than 20 to 11 people.

One of the three 32K-byte PDP-8s is used to record sales, while the other two processors make up a credit authorization system. This system compares an application for a credit transaction with the subject's current "credit value."

A statement prompting authorization by a store manager is flashed on an Infoton Corp. CRT in the event not enough credit is available to permit the transaction.

The network has reduced the store's billing cycle time from "five or six days" to "two or three days," Zinsser stated. Moreover, the volume of delinquent accounts has dropped. Early billing seems to have a psychological effect that increases the likelihood of prompt payment, he observed.

Most Terminals Not Printers

In order to minimize operating expenses, about 70% of the terminals do not have a printer. All information is first written onto a sales check and then entered on the terminal. This has reportedly not resulted in long lines at the sales counters.

The selective use of terminals with printers

(Continued on Page 36)

Store Sold on Benefits of POS

(Continued from Page 35)

is one reason why Sibley's incurs a cost per terminal about half that of most POS systems currently available, Zinsser said. The company does, however, use Centronics Data Computer Corp. Model 101 printers to provide hard copies of credit references.

Sibley's has not found it necessary to have a redundant system at the store level to capture data in the event that communications is lost with the host processors. Redundancy is not needed because uptime for the POS network has been 99.3%, Zinsser said.

For the first 120,511 hours of operation, the network has been down only 1,115, according to Zinsser, who attributed 60% of this downtime to telephone line problems. When downtime has occurred, however, back-office data entry has gone smoothly, he added.

Mean time between failures (MTBF) for the nonprinting Datatrol terminals has been 26.2 months; the printing versions have experienced an MTBF of 11.4 months.

Variety of Reports

Since the inception of the POS system, Sibley's has been able to generate a wide variety of merchandising and financial reports in very short order. "Reports were never as quick, as thorough or as good as they are right now," Zinsser declared.

The system assists store buyers by indicating the flow of sales items. Other applications include a daily productivity report, a weekly report that compares sales personnel on the basis of performance, "instant" checks of cash-on-hand for spot audits and vendor analyses of how many goods have been sold in each style.

Training time for network personnel is said to be low. "This is because every phase of a transaction is prompted in a language the salesperson can understand. He does not have to learn any codes," Zinsser explained.

Sibley's gives each new sales clerk two 45-minute periods of training on the Datatrol POS terminal, although Zinsser said an "alert" trainee can learn the system in about a half-hour.

Training time alone accounts for a considerable savings, since training on a more conventional system might require two or three days, he said.

The customer is more at ease with the automatic credit authorization system because he is rarely aware that his credit is being checked, Zinsser added.

The accuracy of the POS network is rated at between 95% and 96% and correctable to 98% by incorporating a check digit. Prior to the net's installation, tag data collection yielded an accuracy that varied from store-to-store in the 60% to 80% range.

Data transmission through the network occurs at 1,200 bit/sec. Besides the terminals and minis, other hardware components include a number of California Computer Products, Inc. Model 215 disk drives as well as 45 in./sec Pertec Corp. Model 6640 tape drives.

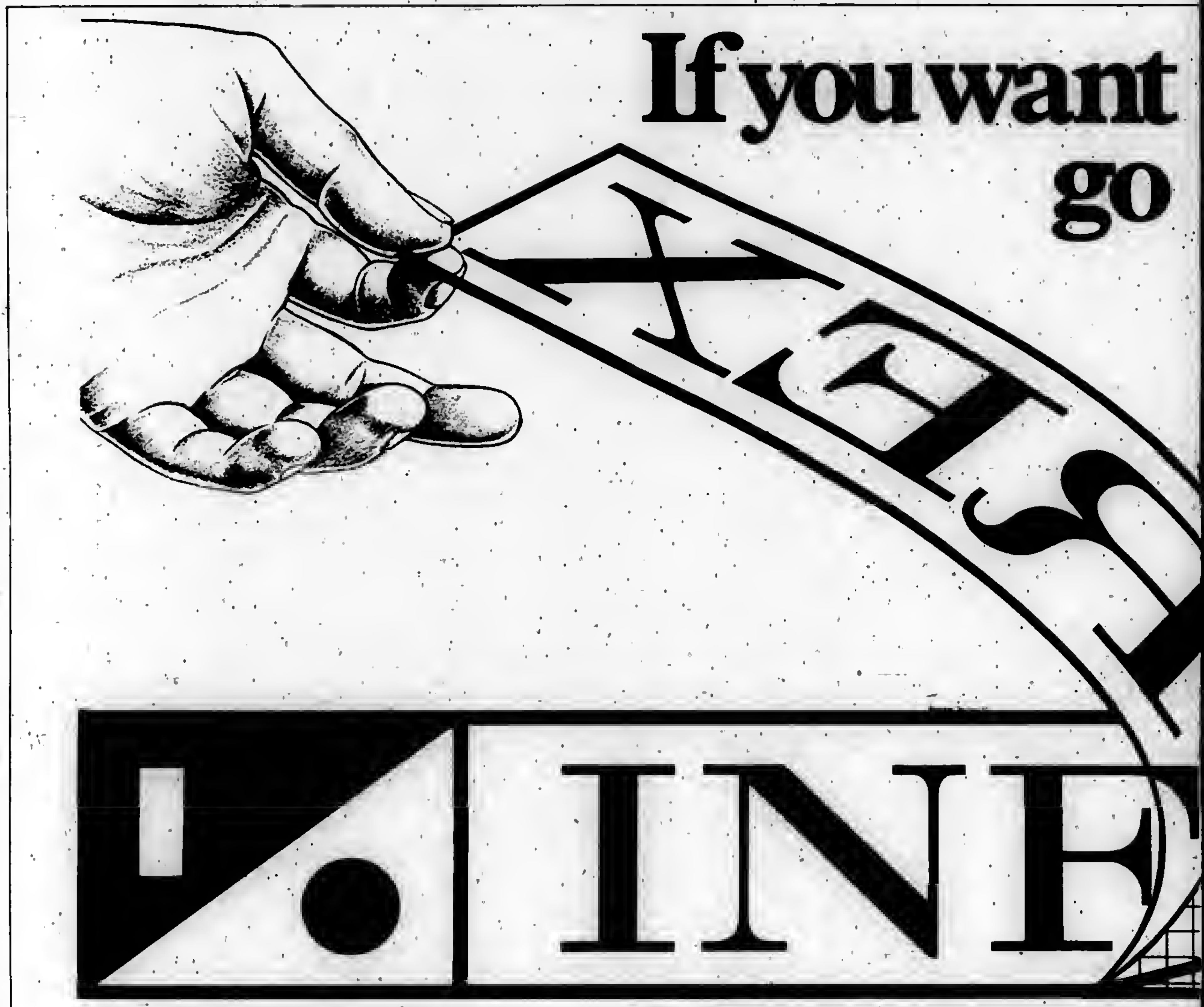
Packet Nets Discussed

PISCATAWAY, N.J. — The November 1978 special issue of the Institute of Electrical and Electronics Engineers' *IEEE Proceedings* is devoted to the subject of packet networks and directed to both the novice and expert.

The issue includes an introduction to packet networks as well as a discussion of protocols, theoretical developments, advanced network concepts and network issues.

"This special issue should be interesting reading for computer and communication scientists, engineers and others generally concerned with information processing," the institute observed.

Individual copies cost $5 for institute members and $10 for nonmembers. Prepaid orders should be sent to IEEE Service Center, 445 Hoes Lane, Piscataway, N.J. 08854.



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Board Adds Features to Decwriter LA35, LA36

SANTA CLARA, Calif. — A graphics modification for Digital Equipment Corp. Decwriter printers, available from Selanar Corp., will add such capabilities to the printer as vector-generated graphics, expanded character styles and higher speed, according to a Selanar spokesman.

The Graphics II system replaces existing electronics in DEC LA35 and LA36 terminals, the spokesman said. Bar code can be printed, and plans include a bar code reader option that will allow data to be transmitted like a keyboard entry.

Available as an upgrade to existing printers or factory-installed on a new printer, Graphics II consists of a microprocessor-controlled replacement circuit board for the Decwriter II. It comes with internal cables for easy installation, the vendor said.

The Decwriter is a matrix printer; the Graphics II allows printing of a dot anywhere on the page, with a total of 1,045,440 addressable points available per page, Selanar noted.

Graphics II has bidirectional line feed with quarter-line resolution, and the vector graphics capability allows a line to be printed between any two points on the page by specifying the end point coordinates using Ascii characters. This means graphics can be generated using the printer keyboard, Selanar explained.

Two Standard Fonts

Ascii and APL character sets are standard, while other character sets may be substituted. Characters can be rotated and printed in four directions and printed normal size, bold face or with expanded width.

The average Decwriter printer speed has been increased to 50 char./sec with Graphics II, and data may be transmitted in bursts of up to 1,000 characters at 1,200 bit/sec, the vendor stated.

Other standard features of Graphics II include EIA RS-232, 20mA current loop and TTL interfaces; automatic line feed; and horizontal and vertical tabs.

As a field-installable circuit card, Graphics II costs $850 from Selanar at 3054 Lawrence Expressway, Santa Clara, Calif. 95051.

Qantel Emulators Offer IBM 2780, 3780 Protocols

HAYWARD, Calif. — Software emulation of IBM 2780 and 3780 protocol is available from Qantel Corp.

The 2780 emulator was designed for the "moderate" communications user and for IBM 360 or 370 applications, Qantel said. This package handles data speeds to 19.2k bit/sec.

The 3780 emulator is said to make more efficient use of communications lines and provide the full capability of the IBM 3780, including compression and conversational replies through an operator's console.

The software is available without charge but requires a Qantel synchronous communications controller, which costs $2,500, the vendor said from 3525 Breakwater Ave., Hayward, Calif. 94545.

Novation Units Meet FCC Rules

TARZANA, Calif. — Novation, Inc. has announced a line of modems, the 4000 series, in 300- and 1,200 bit/sec speeds.

Available in both stand-alone and rack units, the modems are said to meet all standards set by the Federal Communications Commission (FCC), the Electronic Industries Association (EIA) and the Consultative Committee on International Telephone and Telegraph.

The 300 bit/sec units are available with acoustic coupling and FCC-registered direct coupling, while the 1,200 bit/sec units are available for leased lines and FCC-registered direct coupling to dial-up circuits.

Novation offers an expandable rack arrangement in which up to 16 active modem cards can be accommodated.

The 300 bit/sec models range in cost from $275 to $400 and the 1,200 bit/sec units are priced from $375 to $600 from Novation, Department P1, 18664 Oxnard St., Tarzana, Calif. 91356.

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Disk, Memory Also Boosted

Data 100 Model 85 Gets Remote Workstation

MINNEAPOLIS — Data 100 Corp. has enhanced its Model 85-based series of remote information systems by adding remote workstations and increasing both memory and disk storage capacities.

With the addition of up to eight remote operator workstations on the Model 85, users can access resident fields via a multidrop secondary communications line using a synchronous interactive protocol at 4,800 bit/sec from virtually anywhere in their network, the vendor stated.

The workstations may be stand-alone operator stations, printers or a cluster of both, a spokesman noted.

The primary line allows the Model 85, via an attached communications processor, to communicate in synchronous protocols using point-to-point or multipoint techniques and in Synchronous Data Link Control (SDLC) communicatins. Other emulators include Hasp, IBM 3270 and 3780, Univac 1004 and NTR, Control Data Corp. 200 UT, ICL, Inc. 7020; and Burroughs Corp. line protocols.

Memory Expansion

The expanded memory option increases the maximum capacity of the Model 85 from 128K to 256K bytes (available in 64K-byte increments) and raises the minimum system size from 96K to 128K bytes, Data 100 said.

This expansion improves the company's RPG-II and transactional Cobol (Ansi 1974, Level 2) processing capabilities by developing fill-in-the-blanks data entry and remote file management activities for such applications as order entry, inventory control, payroll, production control, asset management and general ledger, according to the vendor.

The memory option also offers double-bit error detection with single-bit error correction capabilities, ensuring that any memory parity errors are automatically corrected without interruption of program execution or function, the company claimed.

Disk storage capacity has also been increased from a maximum of 100 million char. to 245.6M bytes of fixed-disk storage, allowing users a selection of cartridge and fixed-disk capacities starting at 10M bytes, Data 100 continued.

The enhancements are "part of an ongoing strategy to help our customers further distribute their data base-oriented functions to remote sites, as well as unburden the central computer and allow it to handle other processing activitites without increasing its capacity," the vendor said.

The Model 85, introduced in April 1978, operates in conjunction with the company's current models 76, 78 and its Keybatch systems to provide batch communications, data entry, IBM 3270-compatible on-line inquiry, stand-alone processing and file management activities at sites remote from the host computer, the spokesman noted.

The Model 85 consists of a control unit with 128K to 256K bytes of main memory, 10M to 245.6M bytes of fixed and removable cartridge disk storage and up to 16 CRT workstations with 1,920-char. screens and data entry keyboards.

Peripheral equipment includes the use of up to five printers ranging in speed from 62- to 1,250 line/min and 9-track, 800-and 1,600 bit/in. magnetic tape drives.

Configurations, Prices

A typically configured Model 85 system with six operator keystations, 128K bytes of memory, 30.5M bytes of disk, 300- and 62 line/min printers connected to a Model 76 communications processor with 150 card/min reader, leases for $2,787/mo on a one-year lease, including maintenance, and sells for $93,419. Other Model 85 systems begin at $1,660/mo on a one-year lease.

The expanded memory options, available in 64K-byte increments up to 256K-bytes, lease for $120/mo on a one-year lease; the purchase price is $4,032. The expanded memory feature will be available in the third quarter of 1979.

The expanded disk option is available in 20.5M-, 41M- and 61.4M-byte increments and leases (and sells) for $275 ($9,240), $425 ($14,280) and $550 ($18,480), respectively. The lease prices include maintenance.

The expanded disk option will be available in the first quarter of 1979.

The remote workstation support feature, which includes a communications controller interface and appropriate software, leases for $139/mo on a one-year lease, including maintenance; its purchase price is $4,662. It will be available in the third quarter of 1979.

A remote workstation configuration can be leased for $343/mo on a one-year lease, including maintenance.

Data 100 is at 6110 Blue Circle Drive, Minneapolis, Minn. 55435.

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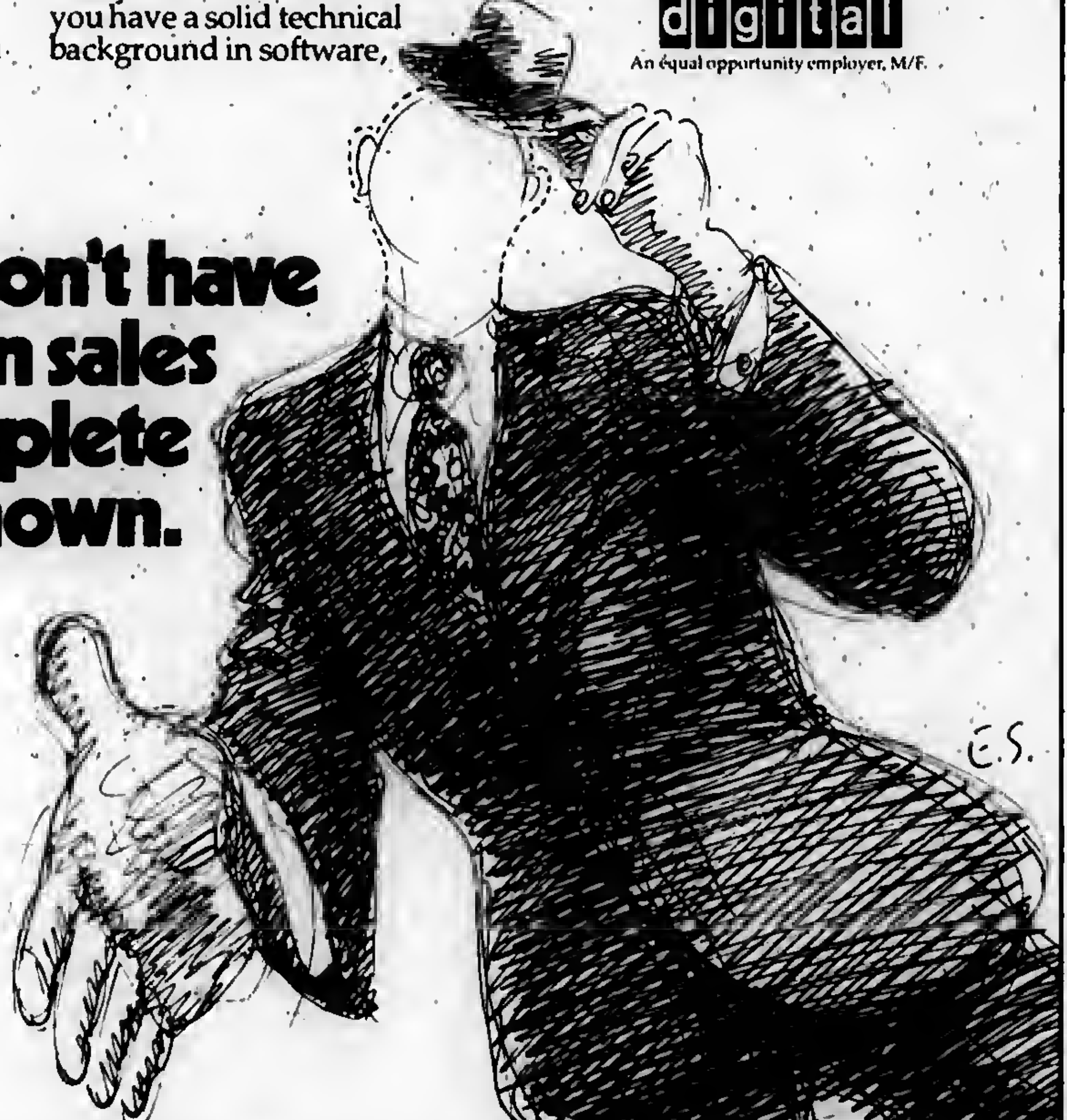

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System Monitors, Manages Phone Use and Cost Data

WALTHAM, Mass. — A standalone, computerized system for monitoring and managing telephone utilization and cost data has been introduced by Telephone Management Systems, Inc. (TMS).

The real-time Zap-Call system stores and processes data on telephone calls and reports this information on demand, TMS declared.

As a result, nonbusiness calling can be effectively minimized, TMS said, and budgeting, network analysis and client chargeback procedures can be expedited.

The system identifies calls by extension, duration, location and cost; allocates telephone costs by department, division or client number; and provides reports on both a detailed and summary basis, TMS explained. The system is reportedly compatible with existing computerized PBX equipment.

Zap-Call is available in three models that can handle from 50 to 600 phone lines and store 10,000 to 25,000 calls. Network management reports are also available for efficient use of Wats, Transmission and Information Exchange and Fixed Area lines.

The system costs $10,350 or more, depending on customer requirements, TMS said from 460 Totten Pond Road, Waltham, Mass. 02154.

Spectron Reduces Price Of Datascope by $1,900

MOORESTOWN, N.J. — Spectron Corp. has reduced the purchase price of the D-301 Datascope monitor from $6,800 to $4,900.

In announcing the price reduction, Spectron said the large number of orders for the D-301 since its introduction earlier this year "has enabled the company to increase its production plans and thus reduce the price of this Datascope monitor."

Line Monitor

The D-301 is a portable, general-purpose data communications line monitor that provides a full-duplex display of transmit and receive data. It features independent line discipline set-up for the transmit and receive sides of the line.

Full-duplex data at transmission speeds up to 72K bit/sec can be stored in a 262K-bit electronic buffer. A search of the buffer contents using a user-selected argument of up to four characters is standard.

Displayed data can be frozen, and the code, bit order, right or left justification (for less than 8-bit characters) and location of highlight markers can be changed.

Spectron is at 344 New Albany Road, Moorestown, N.J. 08057.

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And, in case you didn't know, this is the very same 6600 Printer Series we've been installing for demanding IBM 360/370 and System/3 people for the last three years. And very successfully, we might add. In fact, no other supplier, *except* IBM, has more printers on IBM systems than we do.

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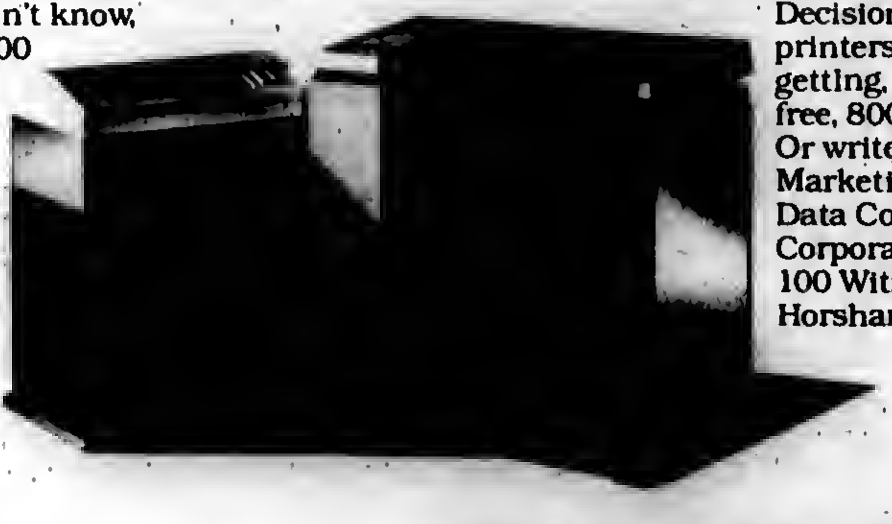

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Dataroyal Adds Faster Version To 7300 Line

NASHUA, N.H. — Dataroyal, Inc. has added a higher speed version to its IPS-7300 line of intelligent hard-copy terminals.

Like other members of the IPS-7000 family of intelligent printing systems, the 150 char./sec IPS-7326 combines a matrix printer with an 8-bit programmable microcomputer. A movable data input station consisting of a gas discharge display and Ascii keyboard is also standard on the system.

The terminal was designd for data logging, factory data collection, label printing and other materials and information handling jobs, requiring both intelligence and output printing capabilities, a spokesman said.

Meets Changing Needs

The unit's microcomputer architecture allows the Model 7326 to be programmed and reprogrammed to meet changing applications requirements, the spokesman said.

Programming is done by plugging in programmable read-only memory chips.

An IBM 2848-compatible serial interface is standard on the IPS-7326 and a 20mA current loop interface, as well as other serial interface types, are available as options.

Price for the IPS-7326 is $4,675 in single quantities and $3,675 for OEMs.

Delivery is 30 days from Dataroyal, Inc., Main Dunstable Road, Nashua, N.H. 03060.

Switch Selects CRT Terminals

ALEXANDRIA, Va. — Atlantic Research Corp. has introduced a desktop video switch primarily intended for selection of IBM 3270 and related CRT terminals in a DP center.

The VSM-1-4 switch is available for single-channel, desktop switching only.

No Power Required

No power is required to operate the unit and all connections are made at the rear panel by five male coaxial connectors, the vendor said.

The VSM-1-4 costs $145, Atlantic Research said from 5390 Cherokee Ave., Alexandria, Va. 22314.

Memorex Cubic HD Computer Tape. Guaranteed tested at 6250 bpi and 1600 bpi.

At last a computer tape that's more than just "suitable" for 6250 bpi applications: Memorex Cubic HD.

It's the computer tape specifically formulated and tested for the demands of 6250 bpi applications. The tape that's passed the most demanding test: each reel is tested at 6250 bpi and 1600 bpi to insure optimum performance on your system.

We believe we are the only manufacturer of computer tape to actually test computer tape at 6250 bpi and 1600 bpi. That gives us added confidence in our Cubic HD product and in the long-term performance you will achieve with Cubic HD on your system. But testing is only part of the story. Cubic HD has a thicker base film which reduces edge damage, provides extra dimensional stability that reduces skew propensity, and improves autoloading.

What's more, this exclusive new tape is wound on SuperReel™ tape reels, Memorex's advanced design reel that's 90% stronger than conventional reels; enhancing high-speed, high-tension drive performance. Improved autoloading. And better tape winds—rewind after rewind.

New oxide formulation. Thinner coating. + Tested at 6250 + Thicker Base Film + SuperReel = Cubic HD Optimized 6250 tape

Cubic HD is manufactured by a new process and utilizes an enhanced proprietary oxide formulation that provides optimum signal recovery and incorporates a cross-linked binder for reduced oxide shed. The benefit is a cleaner running tape with less error-rate buildup.

In short, testing at 6250 bpi plus a thicker base film plus SuperReel plus a new proprietary oxide formulation and process equals an optimized computer tape for high density applications—Cubic HD.

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IBM Users Backed

PIX-II Links Get Support for Floppy Diskettes

LARGO, Fla. — Paradyne Corp. has unveiled support for remote flexible diskette I/O units on its PIX-II virtual data links, which provide a virtual data path from the byte multiplexer channels of IBM 360, 370 or 30 series CPUs to one or more remote locations.

The Paradyne Model 7810 disk drive and Model 7211 controller are said to reduce communications line and modem costs for users of key-to-diskette data entry equipment in distributed processing networks.

Under the IBM Synchronous Data Link Control protocol, the PIX-II diskette support allows data transmission from multiple remote peripheral devices through a single communications line to an IBM mainframe without the need for teleprocessing software or a front-end communications controller at the host, a Paradyne spokesman explained.

PIX-II systems include a Local Control Unit (LCU), which attaches to the host CPU's byte multiplexer channel, and Remote Control Units (RCU) at dispersed sites. The RCUs can support multiple IBM and/or Paradyne devices, including the flexible diskette I/O units as well as CRT terminals, printers, card readers and tape drives.

All data communications functions are transparent to both the host and remote users, the spokesman said, and remote devices function "virtually" in local mode.

The Model 7810 disk drive costs $3,200; it can be leased for $165/mo on a five-year plan that includes maintenance. The Model 7211 controller costs $1,300 or $35/mo on the five-year plan including maintenance.

Paradyne is at 8550 Ulmerton Road, Largo, Fla. 33541.

Devices Measure Bit Error Rates At 150M Bit/Sec

N. BILLERICA, Mass. — The bit error rate of digital communications, fiber-optic and magnetic storage systems can reportedly be measured up to 150M bit/sec using two devices announced by Tau-Tron, Inc.

The Tau-Tron Model MN-301A Bert Transmitter and Model MB-301A Bert Receiver operate at rates from 1M- to 150M bit/sec and use pseudo-random data patterns to exercise the system under test and determine the bit error rate, the vendor said.

Two pseudorandom sequence lengths are employed: 127 bits and 32,767 bits.

Aside from the two pseudorandom sequences, the MN-301A can generate an alternating "1100. . ." test pattern. Errors can be injected into the pseudorandom data at an internal rate of two errors per 100 bits of data or at an externally determined rate, the vendor continued.

The MB-301A provides bit-by-bit error detection using an internally generated reference pattern. True or complement output data may be selected, and synchronization may be manual or automatic.

Bit error rate or cumulative errors can be displayed by the four-digit LED display, Tau-Tron noted.

Autoranging exponent selection is provided for bit error measurements. Variable display hold time and binary code decimal printer output are standard features.

The counter and display can also be used as an independent frequency counter.

The MN-301A costs $3,000 and the MB-301A costs $5,000, Tau-Tron said from 11 Esquire Road, N. Billerica, Mass. 01862.

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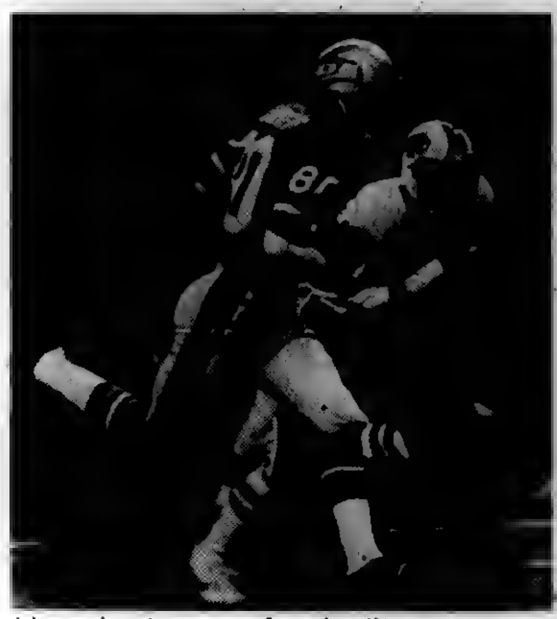
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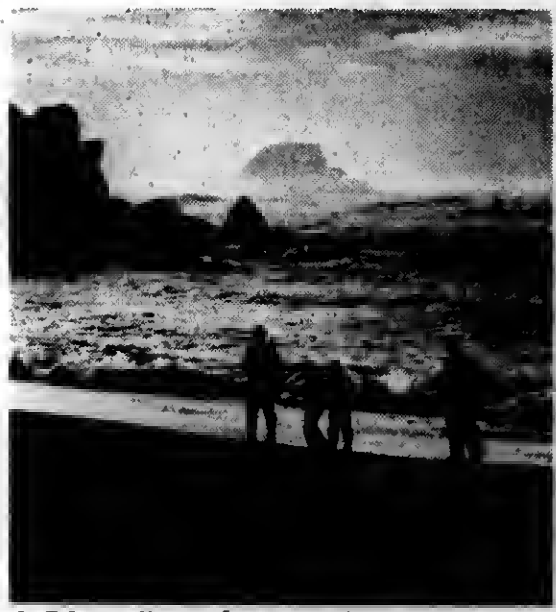
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Memory Doubled to 8M Bytes

User 'Ecstatic' With Add-On for 3033

By Howard A. Karten
CW Staff

CHICAGO — Zurich American Insurance recently installed an Intel Corp. add-on memory on its IBM 3033, becoming the first user of such a unit on that system. The 4M-byte unit supplements the 3033's original 4M bytes of memory, and the addition has made the system's users "ecstatic," according to Tom Regan, Zurich's computer center manager.

"The effect of the additional memory became most apparent in our field operations. Before its installation, response time [on Zurich's teleprocessing network] averaged between 30 seconds and two minutes. Now we're down to three- to five-second response time out in the field. Both field operations and our programming staff are ecstatic," Regan said.

The additional memory has been working perfectly, Regan reported, adding he is pleased with the cost savings as well. "The unit cost us $230,000, compared with the IBM price of $225,000 for only 2M bytes of memory," he noted.

Zurich uses its system virtually around the clock, seven days a week, but was able to clear the weekend of Nov. 11-12 for Intel to install the memory.

Three Reasons

The company chose Intel as the supplier for three reasons — the unit's price, the delivery schedule and the company's past experience with Intel, Regan stated.

Zurich, a subsidiary of a Swiss-owned company, had been using an IBM 370/158 with Intel memory before moving up to an IBM 3033. That experience with the independent memory maker impressed Zurich.

"The Model 158 had 3 M-bytes of memory that was extremely reliable for us. One of the key areas we liked was that Intel had its own service force, rather than using the general maintenance people, and it seemed to be the first to be able to deliver 3033-type memory," Regan said.

Although insurance companies often have a reputation for being extremely conservative and sticking with IBM, the DP manager noted this was not the case with Zurich. For example, "we do not have any IBM terminals in our network," Regan noted.

'Weird' Problem

Regan observed that the installation of the add-on memory went "fairly smoothly, from Intel's point of view. It did have one problem. It had a hell of a time debugging, but it

(Continued on Page 52)

Switch from 370/148 to AS/5 Powers DP Company's Services

By Jay Woodruff
CW Staff

DURHAM, N.C. — Three months after replacing an IBM 370/148 with an Itel Corp. AS/5-3 processor, Triangle Information Systems, Inc. here is "very happy" with the results.

Itel's hardware costs no more to lease than the IBM gear and, except for minor start-up problems, the AS/5 has offered excellent reliability in the short time it has been operating, according to Raymond J. Stanley, Triangle's president.

Triangle, which provides DP service to companies that prefer not to install in-house systems, decided to upgrade because its commitments to customers were about to strain its ability to provide services. The company wanted to "gain on capability so that we would not run short as more service was needed," Stanley said.

The AS/5, installed in August, has 1M byte of memory, as did the IBM 370/148 it replaced. However, it uses only 55% of the electricity and air conditioning of the IBM 370/148.

Triangle plans to upgrade the processor to 2M bytes and to add a second 2M-byte AS/5 in January. The 4M-byte system will be able to operate on the air conditioning previously needed to run the 1M-byte 370/148, Stanley said.

More Power

According to Stanley, "a 45-minute job now takes 15 minutes" with the AS/5, which has three to four times the computing power of the Model 148. "We needed more compute power for adequate user response," Stanley said, "and we decided that for the lease cost of the Model 148, the AS/5 provides the performance of the Model 158 and offers field upgradability."

The AS/5 is expected to cost less over the period of a seven-year lease than the 148 because it can be upgraded; the 148 would have had to be replaced upon reaching its performance limits. The cost of physical replacement was the single big factor that influenced Triangle to lease the Itel gear, Stanley said.

Triangle provides services that find taking advantage of its large system less expensive than buying their own. Those companies range from small businesses that need standard business programs to wholesale distributors with more sophisticated program needs.

Stanley said upgrading to a larger and more powerful system allows Triangle as well as the companies it serves to take advantage of the decreasing cost of hardware

(Continued on Page 46)

STC Doubles Track Density On IBM 3350-Type Disk Drive

LOUISVILLE, Colo. — Storage Technology Corp. (STC) has announced what it claimed is a major breakthrough in disk technology: the doubling of track density on a 3350-type disk drive. The drive will be available in May 1979 at prices STC said are 20% to 30% lower than those charged by IBM for a comparable amount of disk storage.

Installed models of STC's 3350-compatible drive, the Model 8350, are field-upgradable to the increased capacity for a price of $19,400, a spokesman noted. The A2, B2 and C2 models of that drive are all included in this upgrade capability.

Gary Holtwick, manager of systems and product support for STC, stressed that no software modifications will be required by users who want to take advantage of the doubled capacity because the drive appears to be two 3350-type drives to an IBM 370 mainframe.

The drive, labelled the 8650 by the company, is identical to the 8350 in other specifications; it offers 8.5 msec latency, 25 msec average track-to-track seek time and a transfer rate of 1,190 byte/sec, Holtwick said.

The six drives in the 8650 family — the A2, B2 and C2 and the fixed-head versions of those drives (A2F, B2F, C2F) record data at a track density of 957 track/in., according to Holtwick, who said this compares with 485 track/in. for IBM's 3350. A double-capacity 3350-type drive introduced earlier by Control Data Corp., the Model 33502 [CW, Sept. 18], also achieves double density, but that is done with a track density of 660 track/in. and an increased number of platters, according to a CDC spokesman.

The STC breakthrough was achieved

(Continued on Page 48)

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Service Bureau Moves From 370/148 to AS/5

(Continued from Page 45)

so they can all control the cost of increasingly expensive personnel.

IBM Tape, Itel Disk

Triangle uses four IBM tape drives and control units, but uses Itel disk drives because Itel offers a reduced price if the company buys a complete Itel system. Stanley did not have figures available to show the savings involved in buying a complete system, but he did say it was in the neighborhood of 15%.

Thirty-four terminals, including a mixture of CRTs and printers, are used by Triangle and its customers. An IBM System 7, front-ended to the Itel system, receives customer orders which have been called into remote terminals. It runs unattended 24 hours a day and can restart automatically after a power failure.

With the Itel gear, Triangle has maintained "expense parity" with the previous system and has achieved 95% system redundancy, Stanley said. The Itel gear also is more consistent in its user response time.

"We formerly had a response of about 1 sec if the system was not being used heavily, and response was not consistent. Now user response is very consistent at 1 sec," he said.

Stanley plans to replace the DOS/VS operating system with OS, but Triangle has not made a decision on which version it wants to use. "We're looking for far greater capability to match our projected growth," he explained.

Triangle uses IBM and Pansophic Systems, Inc. software packages for itself and its customers. Stanley characterized the packages as "run-of-the-mill computing applications" such as order entry, inventory control and accounting.

"Service in installation and maintenance has been exceptional," Stanley said of the Itel machine. Itel policy is to maintain a field service facility near its installations, and one was already located in nearby Raleigh.

Engineers on Call

Two field engineers are on call, and they arrive on site within the hour, according to Stanley, who was told that 95% of the parts for the AS/5 are stocked in Raleigh and that any other parts which might be needed can be brought in overnight from Itel's Atlanta distribution center.

The engineers call in to check on the machine "almost every day," Stanley said, "before any minor problem gets serious."

In the eight weeks after the system was installed, it went down three or four times, but for no more than an hour each time, he noted. No other problems have surfaced.

Stanley said it is reassuring that Itel has been able to provide rapid service response and parts availability: "I have not compared maintenance figures yet, but everything has been going so well that I haven't been worrying about it too much."

Word Processing Symposium Set

WILLOW GROVE, Pa. — The International Word Processing Association (IWP) will hold its annual Spring Symposium on Feb. 13-15 in Los Angeles.

The symposium is divided into two parts, a conference program and vendor exhibit. The conference will include panels, sessions and workshops on administrative support, photocomposition, word processing management, electronic mail, work measurement and chargeback systems and word and data processing integration.

Registration costs $125 for IWP members and $150 for nonmembers. Further information is available from IWP Conference Services, 2360 Maryland Road, Willow Grove, Pa. 19090.

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For further information, contact Itel Corporation, Data Products Group, One Embarcadero Center, San Francisco, California 94111, (415) 955-0278.

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'More Than Locks and Guards'

DP Site Security Presents Unique Problems

By Robert Lawrence
Special to CW

Computer rooms and bank vaults have certain characteristics in common: both contain assets to be protected, both can be targets for thieves or malcontents and both are vulnerable.

However, computer rooms have several problems not found in vaults, including a higher personnel turnover rate, constant use of the DP area and significantly different surveillance techniques.

Computer room security, therefore, must be planned with DP's particular nature in mind. More than merely locks and guards are needed.

The lure the computer room holds for malcontents or thieves is not necessarily obvious. They may be seeking information valuable to competitors or foreign governments.

Sabotage a Possibility

Sabotage, a relatively new type of behavior to the office world but increasing in the world of high technology, is always a possibility.

In addition, computer equipment and supplies bring a good price on the black market.

Providing adequate protection for the computer room requires a combination of factors:

- Rigorously enforcing personnel screening procedures. No job applicant should be hired until all references have been thoroughly checked. Particularly in areas where shortages of trained people exist, the temptation to let need override procedures may be great.

One may think if one reference checks out it's likely the others will also, but that is not the case. An applicant may have been fired from another post for an offense that could prove costly to the new employer.

- Establishing a systematic supply control procedure with requisition slips matched against removal-from-inventory. Place one employee in charge of supplies and make unanticipated verifications of the procedures.
- Installing a vandal-proof card-control access system that admits only authorized personnel to the computer room. Specify a system with cards that cannot be duplicated.

Such a system will function around the clock, whether or not other departments are in operation.

- Maintaining good after-hours lighting in corridors and lobbies and setting up one "open path" to the computer room for multishift operations.

Further Protection

Other important security methods entail:

- Building good employee relations to reduce turnover. Companies with a highly mobile employee situation are more susceptible to theft and sabotage than companies with employees who have made an investment of time in the company.
- Keeping the lines of communication open. Employees will report theft and sabotage if channels are easily accessible.
- Evaluating remodeling and building moves to determine how they affect security. A move to achieve better use of space may open up security loopholes and create hazards.
- Checking with the local law enforcement agency about patterns of computer room theft and sabotage in the area. Learn what precautions are advised and what steps other companies have taken.

Lawrence is with Systematics, Inc. in Piscataway, N.J.

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Replacing General-Purpose CPUs

Parallel Processors Seen Big Data Bases' Solution

By Esther Surden
Special to CW

NEW YORK — Parallel-processing hardware systems may replace general-purpose computer systems for tasks requiring the search and maintenance of very large data bases, according to Curt L. Harris and Suzanne H. Roberts of General Electric Co.

General Electric has developed such a parallel processor for research purposes, they noted in a paper presented before the recent annual meeting here of the American Society for Information Science.

The processor, called the Associative Processor, if made available commercially would be used in conjunction with a minicomputer to search large data bases.

Current general-purpose computer systems, although far faster than manual methods, "are simply not designed to perform Boolean processing efficiently," Harris and Roberts stated. Conventional systems cannot search full texts of source files because the costs of performing such an operation are unacceptable.

Instead, the CPUs are equipped with data base management packages. "What they provide . . . is a capability to access full text in a limited way using a variety of surrogates which contain much less information than contained in the text itself," they stated. General-purpose computers "are designed to perform accounting tasks or solve mathematical equations," not search text, they added.

The Associative Processor designed by General Electric works with a Digital Equipment Corp. PDP-11/40 minicomputer and disk storage. Strings of characters or words are directly matched to strings of characters or words stored on the system's disk drive. Query terms with as many as 250 characters can be used.

Harris and Roberts noted that the Associative Processor can match text at "the rate of up to 500K char./sec."

Significant Benefits

Several significant benefits can be attributed to using parallel processing instead of conventional processing for these text searches, according to Harris and Roberts.

Since the text source file itself is searched, costly and time-consuming updates to the data base are eliminated. Also, any "textual file can be searched, even if it was not originally designed for a search and retrieval system. [Text] is searchable as soon as it is entered into machine-readable form."

The parallel-processing system is cost-effective as well, Harris and Roberts said. "Based on current prices, on-line full text search for multiple users could be provided at an estimated cost ranging from $200,000 to $800,000," they predicted.

3350-Type Disk Doubles Density

(Continued from Page 45)

through the use of improved electronics in the servo mechanism of the drive, Holtwick said. For users, the breakthrough means a lower cost, smaller space requirements and lower power consumption compared with other IBM-compatible drives, the spokesman explained.

The Model A2 costs $68,400, while the Model B2 is priced at $58,200. Putting a fixed head on these units adds $12,150 to their price tags.

Lease prices for these drives are $1,815/mo and $1,570/mo, respectively, on a one-year lease. The fixed-head option adds a charge of $294/mo to both systems.

These prices compare with IBM's purchase prices of $100,000 for 635M bytes of 3350 A2 storage, $124,800 for the A2F, $79,200 for the B2 and $104,000 for the B2F.

STC is located at 2270 S. 88th St., Louisville, Colo. 80027.

NMA Sets Schedule For Next Five Years

SILVER SPRING, Md. — The National Micrographics Association (NMA) has announced its schedules for its Midyear Meeting and Annual Conference & Exposition for the next five years.

The Annual Conference & Exposition will be held in 1979 in Atlanta from May 8-11 and in 1980 in New York from April 22-25.

Other cities and years are Los Angeles, 1981; St. Louis, 1982; Atlantic City, N.J., 1983; Chicago, 1984; and Atlanta, 1985.

The Midyear Meeting, which NMA termed a "smaller, more intense meeting than the conference, providing a series of technical sessions," will be held in San Antonio, Texas, Nov. 6-9, 1979, and in Phoenix Nov. 11-14, 1980.

The meeting is scheduled for 1981 in Orlando, Fla.; Las Vegas, 1982; Kansas City, 1983; and Washington, D.C. 1984.

Additional information on the meetings is available from NMA's conference director at the association's headquarters, 8728 Colesville Road, Silver Spring, Md. 20910.

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Computerworld CW-1278

Cipher Adds 125 In./Sec Drive

SAN DIEGO, Calif. — Cipher Data Products has introduced a microprocessor-controlled, 125 in./sec tape drive aimed at what a spokesman termed the "large emerging market for high-speed, low-cost drives."

The Whisper Drive is part of Cipher's 900X series and incorporates a Z80 microprocessor. With the company's switching servos, the microprocessor is said to maintain total servo control during load and unload functions, thereby eliminating tape snap, whip or slack. Servo control is also maintained in power fail situations, even during high-speed rewind, according to a company spokesman.

Other functions of the microprocessor are said to include BOT/EOT sensing to eliminate tape overshoot; optical write protect, which eliminates the need for switches, solenoids and mechanical adjustments; and built-in diagnostics and aids that automatically test read-only memory and random-access memory logic indicating any fault conditions on front panel indicators.

The 19-in. by 24-in. drive draws 300 W, the company indicated, and also features LED light sources, a hard-chromed face read/write head and sapphire tape cleaner.

The drives cost $4,300. A formatter is also available for an additional $1,300, the company said from 5630 Kearny Mesa Road, San Diego, Calif. 92111.

CDC Offering Add-On For IBM 30 Series CPUs

MINNEAPOLIS — Control Data Corp. is offering add-on memories for IBM 30 Series systems at prices it said are below IBM's. In addition, the company claimed it can deliver them earlier than IBM.

The company's 33031 and 33032, for IBM 3031 and 3032 systems, respectively, are available in increments of 1M bytes each, for attachment to systems that presently have a minimum of 2M bytes of IBM memory. Another CDC add-on memory, the 33101, attaches to IBM 3033 systems having a minimum of 4M bytes and is offered in increments of 2M bytes.

A CDC spokesman said the add-on products will enable users of all the IBM 30 Series systems to increase memory up to 16M bytes. This compares to a limit of 8M bytes set by IBM for the 3033 and 6M bytes set for the 3031 and 3032, he noted.

The 33031 and 33032 add-on memory are both priced at $75,000 for the first 1M-byte increment and $61,000 for additional 1M-byte increments. Lease prices for the plug-compatible systems are $3,000/mo and $2,500/mo, respectively, on a one-year lease.

The 33101 costs $150,000 for 2M bytes and $260,000 for 4M bytes. Monthly prices (one-year lease) for these amounts of 3033 add-on are $4,500 and $9,500, respectively.

IBM Printer Joins Offerings In 3600 Line

WHITE PLAINS, N.Y. — The IBM 3616 passbook and document printer for savings institutions and banks is said to be the fastest such unit in the IBM 3600 family.

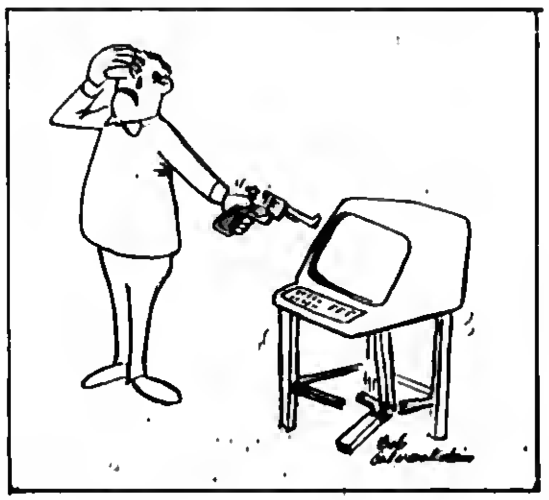
The unit is compatible with all current IBM 3600 finance communications systems devices and can print up to 100 characters on a wide variety of book sizes and formats. Featuring a bi-directional, 7 by 8 dot matrix print head, the microprocessor-controlled unit can operate at a maximum speed of 120 char./sec — four times faster than current 3611 and 3612 printers, IBM noted.

The 3616 includes a basic set of 94 alphanumeric characters, including upper and lower cases. Up to 16 separately addressable matrix patterns can be used to print special characters, and either of the two print stations in the unit can produce double-width, high-density characters for check protection highlighting or other purposes.

The unit, which attaches to a local or remote loop on an IBM 3601 or 3602 controller, can be intermixed with other 3600 family devices as needed, IBM said. For example, the company noted, two tellers with 3604 keyboard CRTs can share a 3616 printer.

Separate keys are used to identify which teller is using the printer. In addition, eight "guidance" lights, three user-programmable lights and five push-button controls come with the unit, IBM added.

First deliveries of the 21-in. wide, 14.2-in. deep, 10.7-in. high unit are expected to begin in the fourth quarter of 1979. The units cost $4,700, while a five-year lease will cost customers $185/mo, IBM said.



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Library Finds Move From Paper to Fiche Easy

By Esther Surden

Special to CW

NEW YORK — Libraries can save money by generating catalogs of their holdings oncomputer output microfilm (COM) instead of paper — and they can do so without changing the software they are currently using.

That message was delivered by Katherine A. Boyes and M.M. Towai of Bell-Northern Research of Canada in a paper prepared for a recent meeting here of the American Society for Information Science.

Boyes and Towai pointed to their own experiences with COM to show how. In 1973, Bell-Northern research decided to create a "union catalog," or master catalog, of the combined holdings of its own library and the libraries of parent companies Bell Canada and Northern Telecom Ltd. Software called the Analytic Library Information Retrieval and Transfer (Alirt) system was developed to handle the task.

Alirt now runs on an IBM 370/168 and generates not only the master catalog for the three original libraries, but also for two related company libraries.

When the Alirt system was created, Bell-Northern printed its master catalog on standard, three-part paper, Boyes and Towai said. Catalogs of holdings sorted by author, title, subject and keywords had to be put together from the paper.

In addition, an overall catalog had to be made up for each of the libraries involved. Using paper was fine as long as the libraries' holdings remained small.

By 1975, however, all the libraries' holdings had increased dramatically. It took two "person-weeks" to put the catalogs into binders and ship them, they said.

Rerun Twice Yearly

This process was undertaken twice a year, when "the master cumulative file was rerun in its entirety." The Alirt system had to be updated monthly, which also was time-consuming using the paper system.

Some 15 binders were needed to hold the four main catalogs, and another eight were required for the four master listings. "Displaying the 15 binders for use by library patrons required a great deal of space, and space for all of us costs money," Boyes and Towai noted. In addition, paper costs were rising faster than ever before.

The library at Bell-Northern Research began to look for a solution to its problem, and it contacted several COM service bureaus. The librarians decided that working with microfiche would be a better alternative than printing the catalog on paper.

At first the library brought in the COM on a trial basis, obtaining a microfiche reader from a vendor "on loan." A heavy emphasis was placed on teaching the users how to find what they needed using the COM. A detailed instruction manual was also provided.

User reaction was enthusiastic, Boyes and Towai reported: "Patrons began using the microfiche regularly, rather than the hard copy still prominently displayed." By 1977, all output was COM except for the master catalog, which continued to be produced on paper so changes could be made to it.

Cost savings from using COM were significant. Had the 12 catalogs needed in 1977 been produced on paper, they would have cost $1,400. On COM, the library produced 25 sets (13 extra) for $313.

"These cost figures include only the output for Alirt — processing and other related costs did not change in any way . . . This was the deciding factor in our final choice of a [COM] service bureau. We chose the bureau with a system capable of taking our tapes as currently produced and indexing the fiche . . . there were no major changes required in our own software," they concluded.

User 'Ecstatic' With Add-On

(Continued from Page 45)

turned out to be a hardware problem in the interface that took the system over the 4M-byte level.

"IBM could have run all the tests in the world, and it would not have shown up until the system went over the 4M core size. It was a really weird type of situation," he recalled.

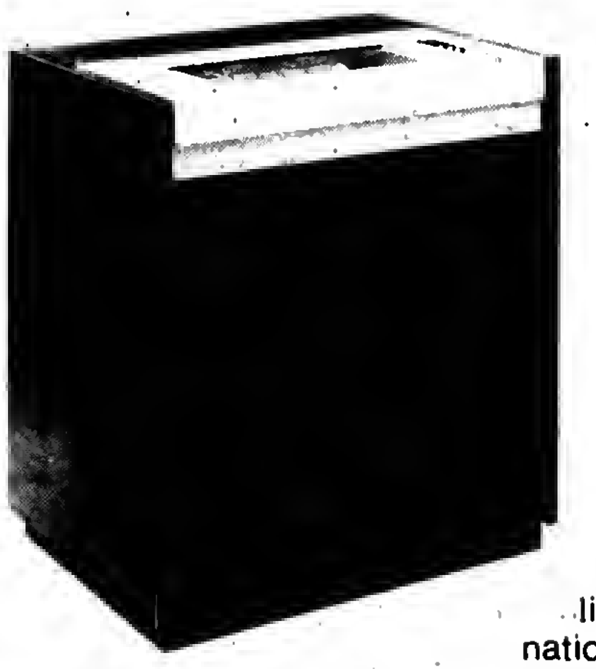
Although Regan noted it is still too early to make a definitive comment on the performance of the Intel memory vis-a-vis the IBM memory, he did comment that his past experience with the Intel add-on memory for the 370/158 was very positive. "Intel's memory turned out to be more reliable than IBM's memory," he said.

"I've always enjoyed working with the Intel people because if they have a problem they tell you, and they keep you well informed of what they're doing," Regan continued. "They're easier to work with than IBM personnel because IBM personnel have more of an image to protect. For example, they don't do a lot of 'finger pointing.' [Intel] has very high-calibre people, and that really makes our job easier."

Notwithstanding this difference in approach, the two vendors have established what Regan called "a good working relationship." "They trust each other," he explained.

"IBM has been very cooperative, especially considering that we're the first" user of an add-on 3033 memory, Regan said.

RENT, LEASE, OR BUY LINE PRINTERS AT GREAT SAVINGS



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Recent Developments In Data Networks

By Louis Pouzin

IN DEPTH
IN DEPTH
IN DEPTH
IN DEPTH

When distances between computers that communicate with one another are short (up to one kilometer) and these systems are located on the same piece of private land, users may employ a number of techniques for communications — telephone or telegraph wires, coaxial cables, optical fibers and even microwaves. Interfaces and signal handling are totally up to the owner of the installation.

When systems are separated by a sizable distance and data must be transmitted across public land, however, national or international regulations require that public networks or some private regulated networks be used. Organizations operating public networks are termed "public carriers" or "common carriers" or, more simply, "carriers."

From the advent of data transmission at the end of the 1950s until 1972, carriers did very little except talk about plans for future data networks. The only thing that was considered were digital circuit swtiching networks designed for carrying data.

The growth of private networks,. which started in 1970, was the determining factor in convincing carriers that *something* was urgently needed. In a very unusual hurry, some of them began planning or building packet-switching networks, while others held to their original plans for digital circuit switching.

In circuit switching, a data path is established between a caller subscriber and a callee subscriber for the duration of the call. The data channel bandwidth, in terms of bit/sec, is constant per call, even if it is not fully used by the subscribers' data.

The transit delay (the time necessary for a bit to cross the network) is also constant and results from electrical signal propagation delays (10 to 50 msec with land circuits).

The basic characteristic of packet switching is that the data channel bandwidth between two subscribers is not constant, but varies with the subscribers' demands. This possibility is normally implemented by carrying data in the form of packets (about 1,000 bits), which are queued for transmission within one or several intermediate switching computers called "nodes."

The transit delay is substantially longer than with circuit switching (typically 150 to 500 msec) because of intermediate storage and queueing. It also follows a stochastic distribution..

Packet-switching networks implemented by carriers offer a virtual circuit service. This means an association must be established between a caller and a callee before data transmission is allowed.

This technique actually mimics a call in a circuit-switching network. The initial call may be avoided by using a variant of the service called a permanent virtual circuit.

Most private transmission networks using packet switching implement a simpler service called a datagram, which does not require any call set-up before transmission can take place.

Let's briefly examine the major carrier data networks presently or about to be available.

Electronic Digital Switching

Germany is the foremost European country in the use of Telex. The concern of the German postal, telephone and telegraph (PTT) authority was to modernize and expand its Telex network while providing new data transmission services.

Electronic Digital Switching (EDS), developed by Siemens, was chosen as the solution. It is a computerized digital circuit-switching network offering bit speeds from 50- to 9,600 bit/sec. However, the fairly old technology used for the switches restricts the number of higher speed circuits that may be maintained without unacceptable bit speed distortion.

Presumably, the bulk of subscribers will use 50 bit/sec for Telex or 600- to 1,200 bit/sec for CRT terminals. The first switch was put into public service in 1976. Since then several more exchanges have been connected.

Nordic Data Network

Denmark, Finland, Norway and Sweden have much experience in cooperation. They are presently building a synchronous computerized digital network offering permanent and switched circuit services.

Circuit speeds range from 50- to 9,600 bit/sec. The suppliers are home-based firms: Ericcson, Nokia and Elektrisk Bureau.

The operation of the network should begin in 1979; an expansion phase is planned through 1985.

CTNE

A number of years ago, the Spanish PTT and a collection of potential, large data communications users created a common subsidiary. Users were mostly banks.

A packet network, Compania Telefonica Nacional de Espana (CTNE), started operating around 1973. Presently two nodes are installed in Madrid and Barcelona. A number of concentrators provide for terminal and host attachment.

Services are basically terminal-to-host transmission and a message delivery service similar to store-and-forward Telex. A CTNE host offers a time-sharing service.

CTNE has two subsidiaries. One is a joint venture with the U.S.-based Computer Sciences Corp. called Ibermatica, which operates a Spanish extension of Infonet.

The other is a joint venture with Japan's Fujitsu Ltd. It should produce terminals for CTNE customers.

There is no doubt that the Spanish PTT has a strong commitment in the DP industry. Future developments are worth watching.

Tymnet

Tymshare Corp. started as a U.S. time-sharing service bureau. Acquisition of sev-

(Continued on In Depth/2)

IN DEPTH

(Continued from In Depth/1)

eral service centers and expansion of the customer base led to the development of a private transmission network, Tymnet, using telephone lines and minicomputers, which became operational in 1971.

Arrangements were later made so other organizations could connect their own computers to Tymnet. This facility became quite popular and partially turned Tymshare into a nonregulated carrier. Eventually, Tymnet became a separate subsidiary and got a carrier license from the Federal Communications Commission (FCC) in 1976.

Now eight European countries access host computers in the U.S. through their own PTTs and through International Telephone & Telegraph Corp. (IT&T) instead of doing it illegally through European extensions of Tymnet. Of course, the switching equipment is provided by Tymshare.

Tymnet presently has more than 200 nodes and is accessible in 117 American cities. This makes it the largest packet network ever built. Its switching technique is geared toward slow-speed terminals (110- to 1,200 bit/sec).

When a terminal dials in, a central network supervisor builds a logical bidirectional connection throughout the net between the calling terminal and the called host. Once established, the route is fixed for the duration of the call.

Packets exchanged between nodes contain an aggregate of characters from a number of logical connections. Host interfacing is taken care of by Tymnet in the form of a front-end converter called Tymsat.

For Europeans, Tymnet is primarily a way to access data bases located in the U.S. Multinational firms (i.e., American) use it to pass data and messages between U.S. headquarters and European subsidiaries. Computing services are also used on European hosts.

Tymnet is an interesting example of several logical networks sharing a single physical network. Indeed, a user can only be connected to hosts on which he has an account.

Furthermore, European access to American hosts operated by Tymshare is only possible through private Tymnet concentrators, while European access to American hosts which are subscribers to Tymnet is only possible through PTT-operated concentrators.

Incidentally, PTTs charge two to four times more than Tymnet for transmission costs.

An electronic mail service, Ontyme, is available from the U.S. and Canada, but not from Europe. Rumor has it that Tymshare feared possible PTT reprisals.

Telenet

This network is a commercial offshoot of Arpanet, the experimental network built by the U.S. Defense Department's Advanced Research Project Agency. Telenet Communications Corp. opened in mid-1975. It is a regulated domestic and now international carrier. Access points are located in 85 cities in the U.S.

Services offered are primarily terminal-to-host and some host-to-host traffic. Telenet indicated recently that traffic is increasing by 15% each month (a quick calculation translates into fivefold within a year).

Host interfacing is usually taken care of by Telenet, which provides conversion in the form of software packages in the host or in the net. Thus, the host interacts with the network as if it were a cluster of familiar terminals. Hosts can also use Telenet protocols for packet transmission and terminal handling.

The switching technique is geared toward fast transmission of independent packets. This could be construed as mostly suitable to on-line transaction or batch traffic exchanged with buffered terminals. Actually, practically all terminals are slow-speed (110- up to 1,200 bit/sec) and character-oriented.

Another notable trend is that nodes are clustered in "central offices," with regional star nets radiating from there. It will be interesting to see whether Telenet goes back to the old telephone system approach with local exchanges, central exchanges and transit exchanges, all hierarchical with quasi-fixed routing.

Telenet is accessible from Europe, but only through PTT concentrators. Actually, the same gear in each country is used indifferently, and at the same tariffs, for accessing Telenet and Tymnet. The European PTTs' policy is to treat all foreign carriers on equal footing — and to kill competition.

Telenet and Tymnet are called value-added networks (VAN) because they use circuits leased from other carriers, mainly AT&T.

Datapac

This network has been built by Bell Northern Research for the Trans-Canada Telephone System (TCTS), a telephone carriers association dominated by Bell Canada. It opened in mid-1977, wth accesses in Ottawa, Montreal, Toronto and Calgary.

Since then, extensions have been made to Vancouver and a few other cities.

Datapac is technically similar to Telenet and offers basically the same services. In addition, some IBM transaction and batch terminals are supported by concentrators.

Transpac

The French PTT is installing a public packet network. Announced initially for 1976, the opening date has been delayed several times; the last forecast was December 1978.

Initially, the network should contain 12 nodes and 13 concentrators, providing access in 25 cities. In principle, access is supposed to be available in any location in France. However, it remains to be seen whether this principle will work any better than in the telephone system.

Services to be offered range from 50 bit/sec up to 48K bit/sec. Access will be possible through Telex, telephone or leased lines. Most contemplated utilizations are connections between hosts and slow-speed terminals. Remote batch connections are being tested.

The switching technique is rather uncommon for a network of the present generation. Packets follow a fixed route, and there is no end-to-end error control within the network.

Euronet

In 1975, the countries of the Common Market reached a consensus to build a shared data transmission network for accessing data bases in Europe. Eventually, the European Commission was persuaded to place a contract with the PTTs.

A final decision was reached in favor of a Transpac copy, to be installed toward the end of 1978. This date is to be understood as six months after Transpac opens.

The network will have four nodes — in London, Paris, Frankfurt and Rome. These concentrators will be located in Dublin, Amsterdam and Copenhagen. The intended service is primarily terminal-to-host connection for slow-speed terminals. Host adaptations are being studied.

The initial implementation of Euronet is being funded by the European Economic Community (EEC). Supposedly the network could be upgraded on the PTTs' money to become a European public data network. However, there are predictable difficulties in implementing that plan.

A European net controlled by the PTTs and paid for by the EEC was certainly, from the PPTs' viewpoint, a better alternative than one or several more private nets. It is not as clear that a European net financed by the PTTs will be viewed as a better alternative than interconnecting national nets through domestic gear.

The European Commission has devoted some effort toward the definition of a common virtual terminal and query language for accessing data bases within the European community. There is no firm indication as yet that this goal is being achieved.

On the other hand, the idea of sharing data bases may require more maturation time in Europe. Indeed, in anticipation of the network service, some countries are buying and installing national data bases in order to satisfy domestic needs and possibly export services.

At least initially, Euronet appears to cause more data base duplication than sharing.

Compak

In the U.S., ITT is developing a VAN on which not much is known besides sales talk. It has been claimed that this network will solve all kinds of interconnection and incompatibility problems between various equipment.

In the spring of 1978, a first phase was announced which was to provide nationwide facsimile, with automatic conversion between incompatible terminals.

A few months later, it appears the service opening has been delayed by at least one year. Problems are said to be

(Continued on In Depth/8)

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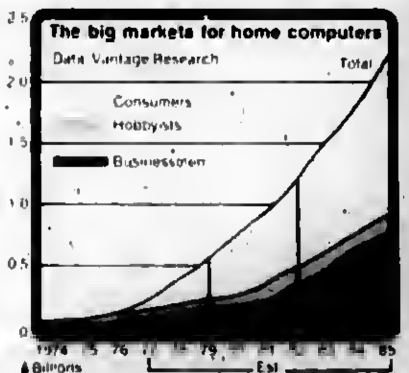

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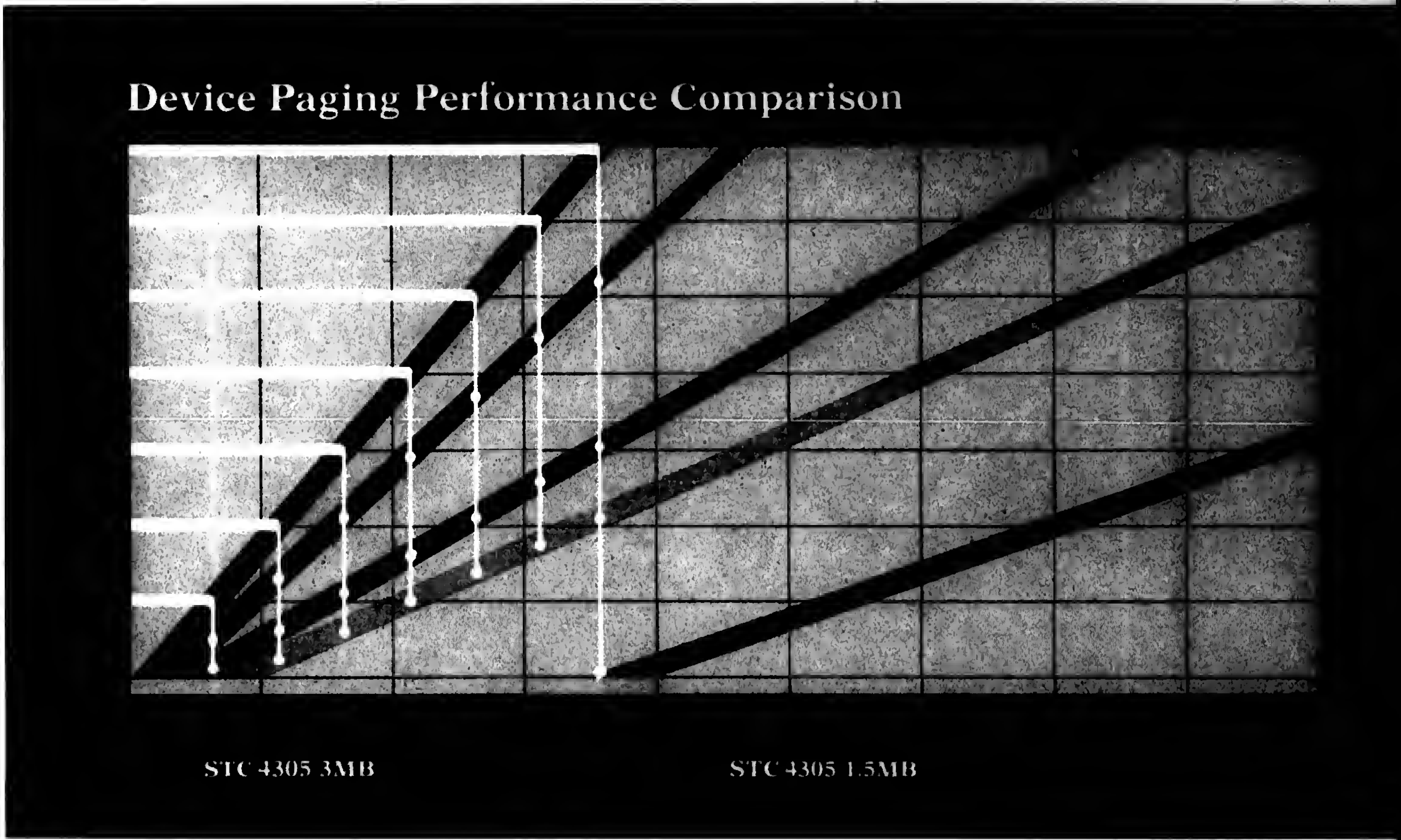

Until now, you've had three options to improve virtual machine performance, all of which were expensive: upgrade the CPU, add memory, or add drum storage.

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* 3.0 Mbyte/second and 6.0 Mbyte/second (aggregate transfer rates are options and require two byte wide interface from IBM.

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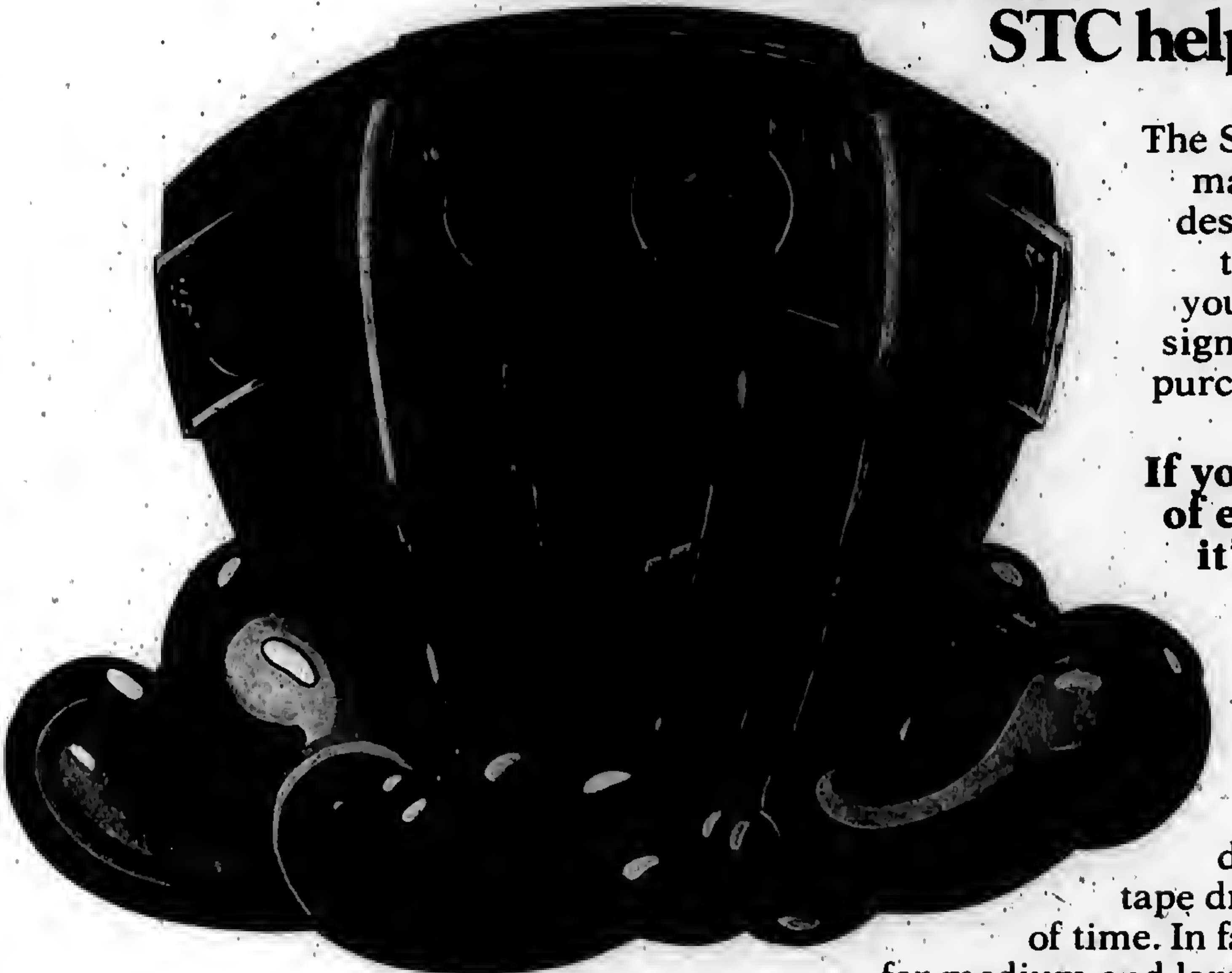
Solid State Disk: Just one of the ways STC helps you get more for less.



The Solid State Disk is just one of many STC products and services designed to help you get more productivity, and more useful life out of your IBM computer. And do it with significant cost savings in both purchase price and operating expenses.

If you have the impression that one of every three tape drives is ours, it's more than an impression. If it's ever seemed to you that everywhere you see medium and large-scale computers, you see our name, it's not just an impression.

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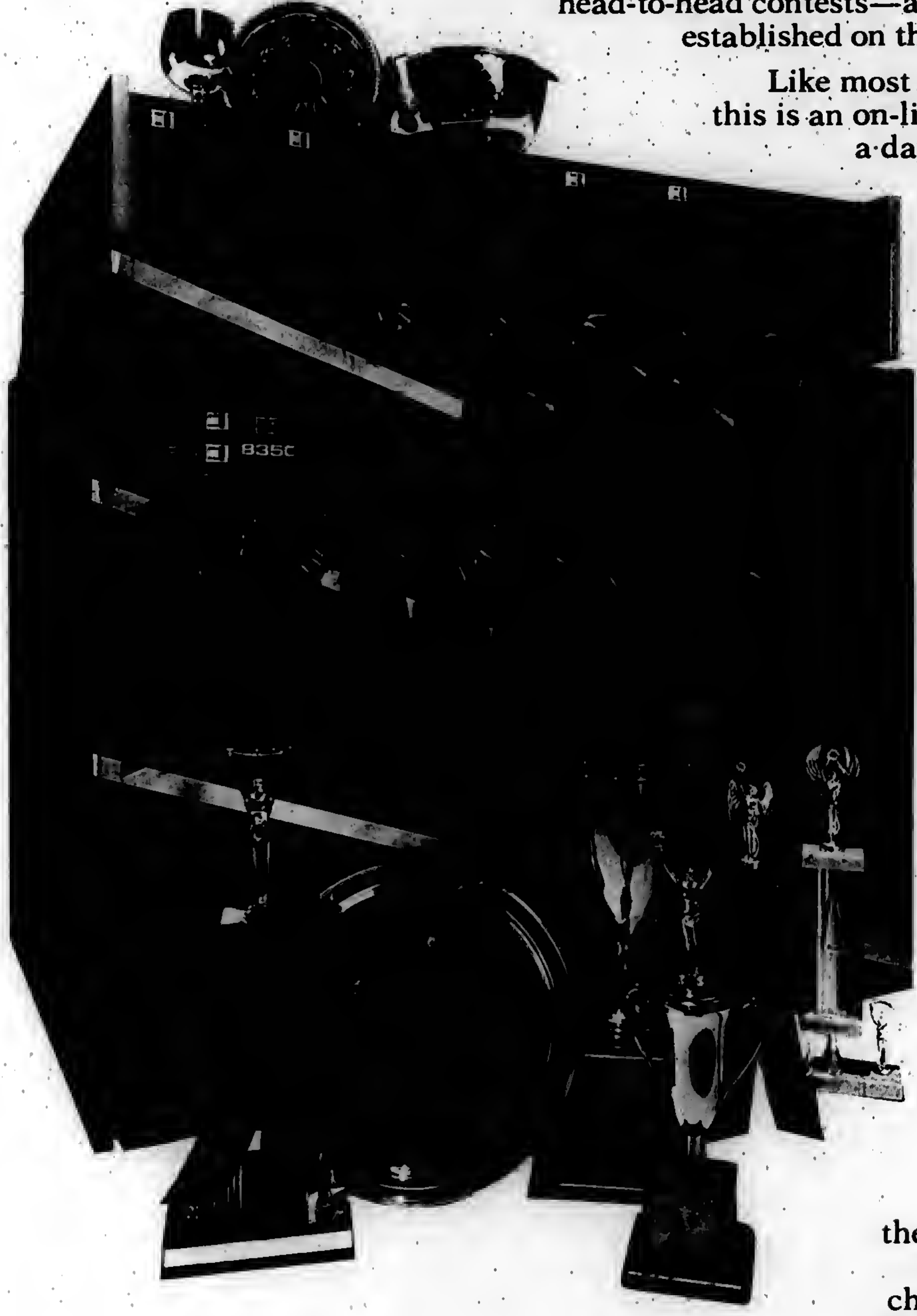
Now, to our customer (and you know who you are) who is still using STC tape drive 001: Come on. Give us a break. How long will a STC tape drive last? After 9 years, we still don't know. You see, the first engineering prototype we built back in 1969 is still being used by a California-based electronics firm. It hasn't had a service call in over two years. And our first production model, serial number 001, was field-converted from a 2450 to a 3470 (IBM 3420-7 equivalent) two years ago, and is also still being used heavily by one of America's largest retailers. So we're beginning to wonder if they'll ever buy a replacement. In the meantime, we'll keep giving them the same great service that's made our field engineers a legend in their own time.

Help, police! Creativity can sometimes make the difference between good service and great service. For example, can you imagine yourself asking the police to pick you up? That's what a couple of our field engineers did during Boston's driving moratorium last winter. An STC customer had a significant problem, and since the only legal way to drive was with a police escort, our people had to call for police assistance to reach the site.

Now, we obviously don't relish the image problems that might result from our FEs riding around in squad cars. So we're thankful that this was a rare event during the 3-day, 12-state storm. But it does underline why STC field engineers are popular enough with our customers to top the June **Datapro** report with a 3.6 rating.

Why the 8350 has never lost a contest. Fixed media disk users are a very picky lot. Many of them demand vigorous benchmarks before buying a winchester drive. The STC 8350 is used to winning these head-to-head contests—a pattern of success established on the very first installation.



Like most fixed media disk applications this is an on-line system running 24 hours a day, seven days a week. Anticipating typical new product problems, we arranged for this customer to provide computer time for engineering work. As it turned out, we didn't need even a fraction of a CPU second. During the 90 day test period, there wasn't a single hardware failure.

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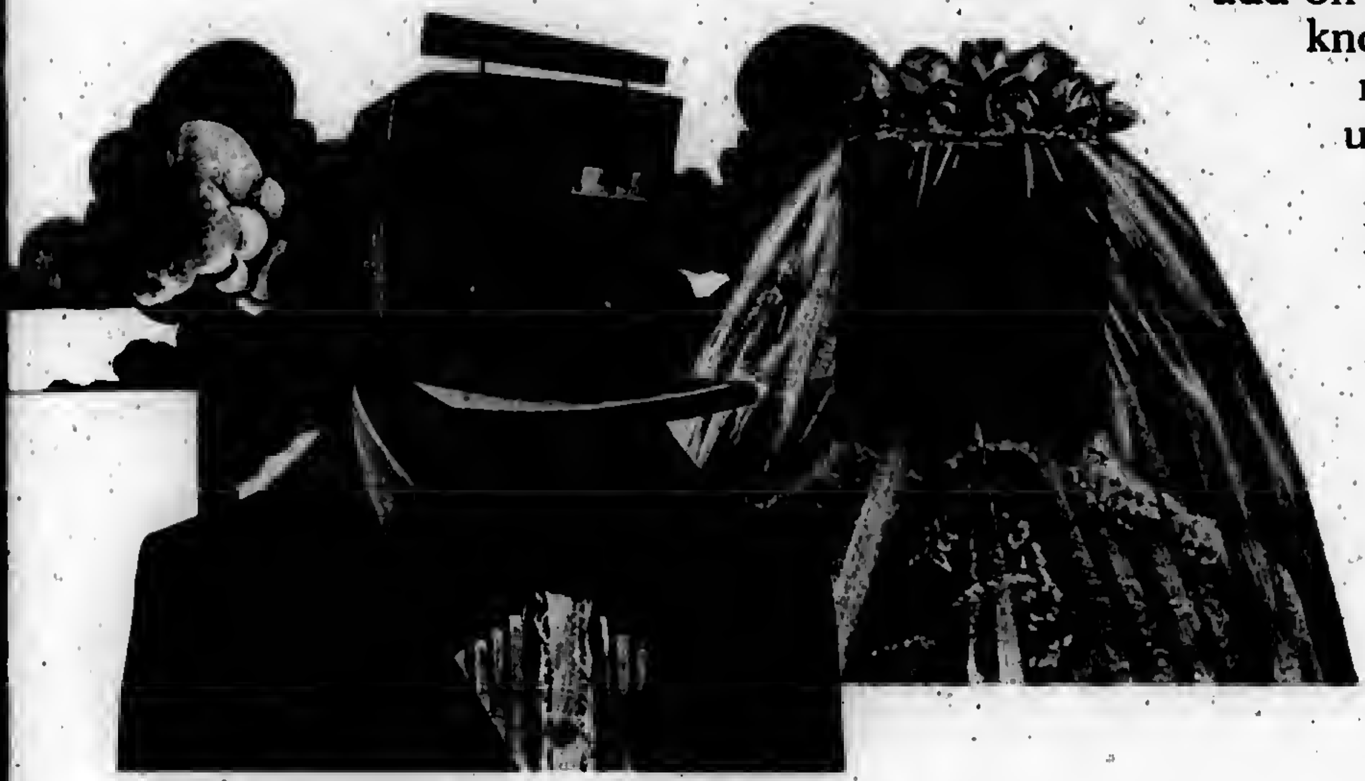
Our philosophy in providing these tools is simple. If we help you get more from what you have today, you'll probably want to do business with us when you're ready to grow tomorrow.

Before you wed your CPU to an add-on memory, check out their hand holding. You know that when it comes to add-on memory, installation and service are as important as hardware.

So you should know that our STC field engineers have over 250 Mbytes of large system memory experience (including more 168 add-on than any independent). So they know how to get you up and running fast. STC's new family of 158, 168 and 303X add-on memory uses the latest MOS technologies. They have fewer components for fewer failures, reduced power consumption and less heat dissipation. Their modular design makes for an easy growth path, too. All our people have to do to give you additional capability is plug in additional cards. This typically takes less than a shift, including the diagnostics. And if that's not enough to convince you, price and availability should be. Because STC add-on memory costs 30% to 50% less than IBM's. And it's available today.



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STORAGE TECHNOLOGY CORPORATION

IN DEPTH

(Continued from In Depth/2)
technical.

This company has been created as a subsidiary of IBM, Comsat General and Aetna Life and Casualty. Each one owns a third of Satellite Business Systems (SBS).

The FCC has allowed SBS to offer a domestic digital tansmission service using satellites. The target market is 200 major companies in the U.S. They would be offered a private network service catering to integrated communications (telephone, facsimile, teleconferencing and data exchange) with a much higher bandwidth than would be feasible or economic with land lines.

Presumably, IBM is developing interfaces between the communications gear and various terminals, including PBX telephone exchanges. Earth stations would be located on private premises.

This service is scheduled to open with 24 earth stations in the beginning of 1981. Extensions could reach 600 earth stations over five years. Earth stations will be rented from SBS.

Presently, SBS is only a domestic U.S. carrier, but some feelers have been put out to foreign carriers in view of a possible cooperation. In Europe, some propaganda purports to amalgamate SBS and IBM and paint them as the absolute evil. It looks as if the prospect of cheap and abundant worldwide communications were ominous to some organizations.

Bell Data Network

AT&T's plans for a data network were leaked out over the past three years. Finally, in June, it officially requested the FCC to declare its position regarding a future Advanced Communications Service (ACS).

AT&T's legal status is quite entangled. On one hand, it is allowed to offer only FCC-regulated communications services; on the other hand, a Consent Decree with the Justice Department bars AT&T from getting into the data processing business, even through a separate subsidiary. Thus, unless the Consent Decree is revised, ACS can only be cleared legally as a regulated communications service.

As opposed to the traditional carrier approach, ACS will not offer transmission services per se. Rather, it will offer terminal support and message management. Terminal support will fall into several classes:

- Class 1: Asynchronous start/stop Ascii terminals, 110- to 1,800 bit/sec (e.g., Teletype Model 35).
- Class 2: Buffered terminals, same code and speeds as Class 1 (e.g., Hazeltine Corp. Model 2000).
- Class 3: Asynchronous start/stop polled terminals, 135.5 bit/sec (e.g., IBM 2740/2).
- Class 4: Synchronous polled terminals, 2,400- to 9,600 bit/sec (e.g., IBM 3270).
- Class 5: Batch terminals under Binary Synchronous Communications (BSC), 2,400- to 9,600 bit/sec (e.g., IBM 2780).

The CCITT X.25 interface will be available as one of the synchronous procedures. A number of network parameters controlling terminal handling and data transmission will be customized and can be adjusted by the customer through specific commands.

In addition, ACS will offer text editing, message storage and management and data collection functions.

The target date for the first experimental users is the end of 1979. Thus, some time remains before the whole gamut of network capabilities is uncovered.

Unquestionably, ACS is intended to be a substitute for communications-oriented products such as front ends, concentrators, multiplexers, terminal controllers and even terminals since AT&T is marketing its own terminal line called Dataspeed.

American VANs (such as Telenet or Tymnet) and equipment manufacturers are likely to be in competition with ACS. On the other hand, there will be ample opportunities for the marketing of ACS-based products, which may be profitable compensation.

Comparing Tariffs

Every user would like to compare network tariffs the same way he compares railways or airlines tariffs. In fact, however, it is not so easy.

Data networks' tariff brochures contain a large variety of tariff components, which make an overall compari-

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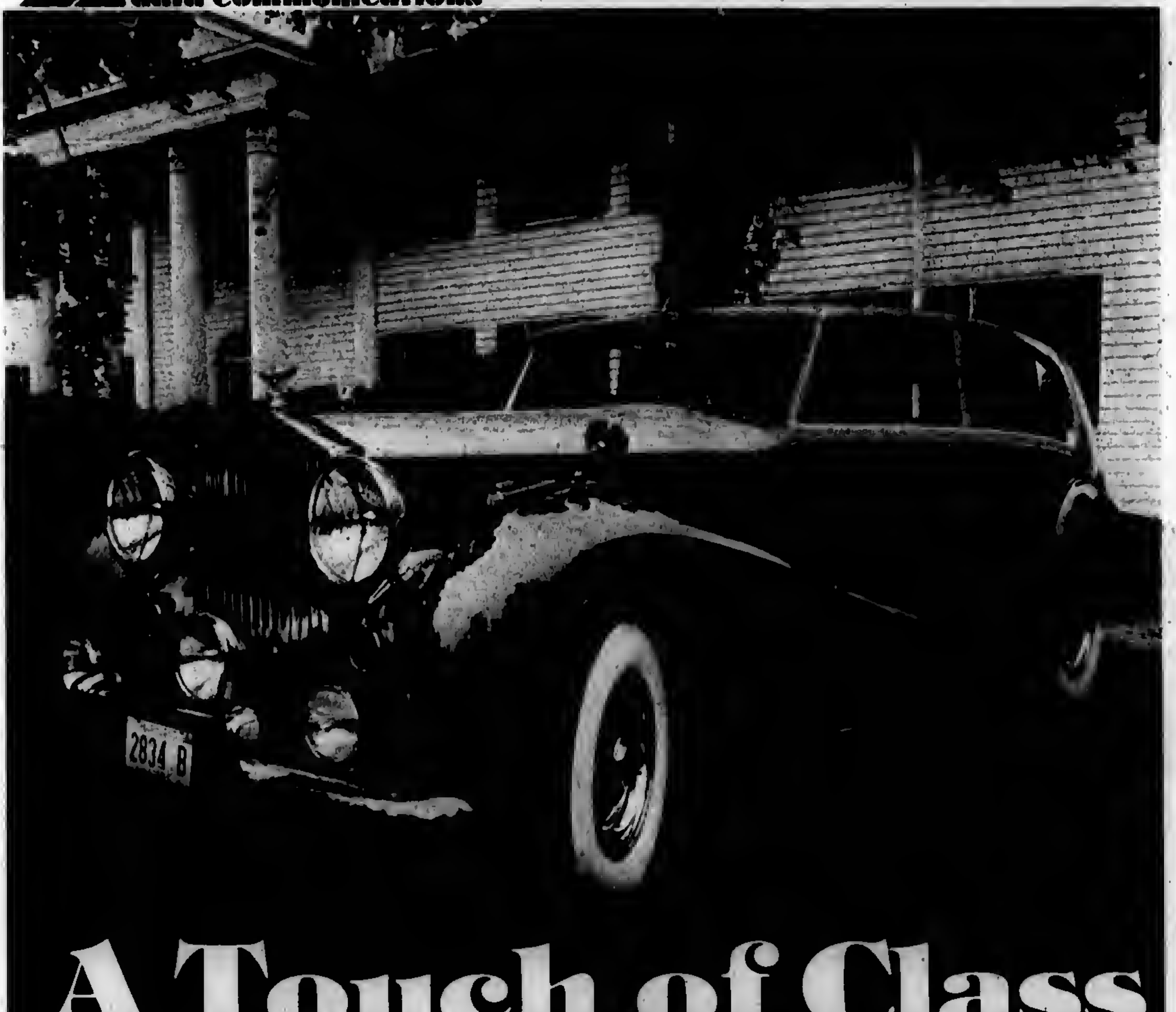

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son quite elusive. Let us take some samplings.

Telenet Tariffs

The cost of using Telenet is $60 per kilopacket. A packet can contain 1 to 128 characters, depending on the way the user fills it.

For the use of a dial-in port at 110- or 300 bit/sec, the hourly charge is $1.40 in high-density areas and $2.40 in low-density areas for the first 800 hours; $1.40 and 90 cents, respectively, for 800 to 1,400 hours; and 90 cents in both high- and low-density areas for more than 1,400 hours.

Telenet allows a discount varying from 20% to 50% when the monthly bill is between $5,000 and $18,000.

Transpac Pricing

In French francs (FF), currently worth 23.5 American cents each, the cost features of Transpac are:

- .05 FF per 1,024 characters (by fractions of 64 characters).
- A monthly subscription fee of 270 FF (up to 300 bit/sec).
- Use of dial-in port: .05 FF/min.
- Use of a virtual circuit: .01 FF/min (up to 1,200 bit/sec)
- Minimum charge per call unknown, but no more than 0.31 FF.
- A 40% to 80% discount on volume and virtual circuit time charge during off-peak hours.

Euronet Costs

In Belgian francs (BF), which are currently equivalent to 3.4 American cents, the cost features of Euronet are:

- .06791 BF per segment of 64 characters.
- Use of dial-in port: 1.36 BF/min (up to 1,200 bit/sec).
- A 33.3% discount on volume charges and 20% discount on time charges during off-peak hours.
- Unannounced national access charge.

As one can infer from these three examples, there is no possible across-the-board comparison. It is clear that billing will be very sensitive to user traffice patterns. Cost projections based on raw data volume may be totally unrealistic when messages are chopped short.

From a general point of view, tariffs illustrate very well the chaotic and parochial carrier approach to international communications. A close look at international tariffs would reveal "tariff walls" — overcharges decreed by the European PTTs to prevent domestic traffic from going abroad.

The Standards Issue

The widespread expansion of long-haul data networks makes it desirable to take advantage of the diversity of computing services already available on a large number of hosts. Furthermore, new services germane to the very existence of networks are becoming available (electronic mail, teleconferencing, environment monitoring).

Thus it appears all too natural, from a user standpoint, that most computing services be accessible from any terminal and that data or programs move across systems boundaries.

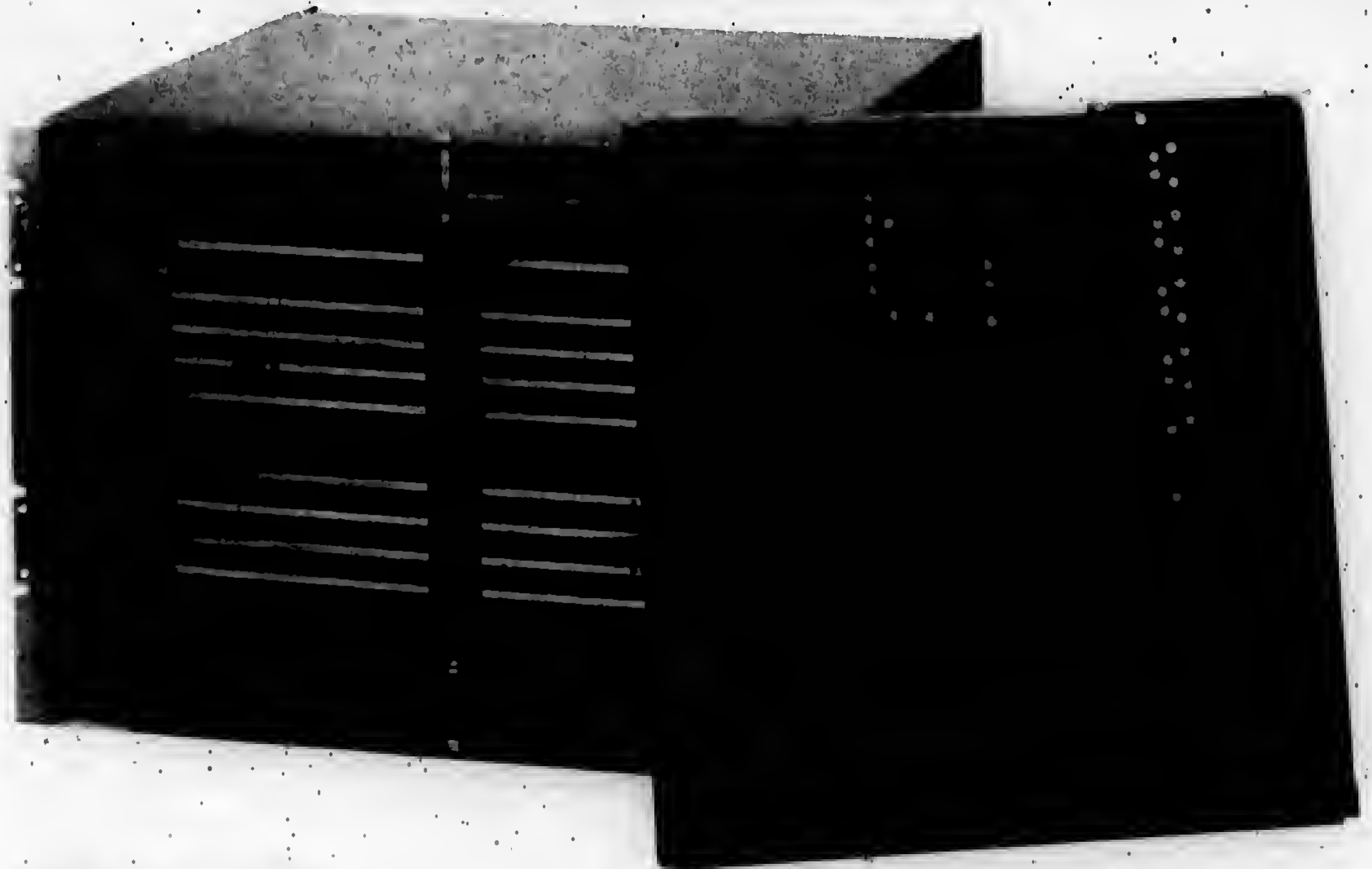
Interconnecting systems and terminals require a highly sophisticated level of common conventions, which are termed "protocols" in the network jargon. In order to avoid specific adaptations, it is desirable that international standards be agreed upon and applied. In the computing field, however, standardization has remained razor thin because of the business competitive nature and because of the lack of motivation from suppliers to come to any agreement. This situation is now changing very rapidly because users and carriers are pressuring suppliers for the capability of achieving a much larger degree of interworking than in the past.

Two major standard bodies are working out network standards: The International Standard Organization (ISO) is a federation of national standard bodies. The Comite Consultatif International Telegraphique et Telephonique (CCITT) is a carrier club.

Since 1975, ISO has produced a set of standards for the control of a "data link," a logical channel, for point-to-point and multipoint circuits. These standards are known as High-Level Data Link Control (HDLC).

A subcommittee (TC 97/SC -16) this year began studying standards for "open systems interconnection," the requirements for heterogeneous systems to interwork. This activity is cer-

(Continued on In Depth/10)



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(Continued from In Depth/9)

tainly the most significant step taken by ISO toward comprehensive DP standards.

Since 1976, CCITT has produced a set of standards defining the interfaces between user equipment and public packet networks, for transmitting packets and for handling asynchronous start/stop terminals between 50- and 300 bit/sec. This set is known as X.3, X.25, X.28 and X.29.

The historical distinction between communications and DP is fading; the new communications services offered by public networks are actually DP systems. Thus there is some growing overlap between ISO and CCITT. So far the cooperation between these two bodies has been rather flimsy.

Among the networks reviewed earlier, Telenet, Datapac, Transpac and Euronet are offering CCITT interfaces, or more precisely their own interpretation of the standards. In addition, they have their specific facilities which are not standardized. There are yet no well-defined interface specifications for packet network services guaranteed to work internationally.

The other networks still do not have CCITT packet interfaces, but they say they will. EDS and the Nordic net use the X.21 interface defined by CCITT for digital switched circuits.

Building Gateways

In the absence of standards put into practice, the only way to achieve interworking between networks is to build adapters, also called protocol converters or gateways.

A gateway acts as a middleman between two data networks. Either side of a gateway conforms to the protocols and interface requirements of either network. In between, data and control information are mapped from one network conventions into the other network conventions.

This is easier said than done, as the mapping is not always straightforward. It usually requires some approximations and may introduce restrictions.

Passing packets between two packet networks is not a sufficient condition for providing a useful interconnection. The target is to allow interworking between users and DP systems of either network.

Data transmission protocols are only a lower "layer," and additional upper layers of protocols are needed. When these upper layers' protocols are different, it is necessary to perform an appropriate mapping in the gateway.

For example, if we want to transfer a file from one distributed processing system to another across two packet nets, mapping packets is not sufficient if there is no common file transfer protocol. In this case, a gateway should be capable of receiving a file and retransmitting it.

A possible implementation technique would be to simulate a line printer on one side and a card reader on the other, with an appropriate insertion of job control commands. If the structure of the file is more complex than sequential, additional conversion functions would become necessary.

As one can see, there is no general solution to the problem of interconnecting networks. Gateways are built for specific purposes.

The Security Problem

There are many ways in which public transmission systems can be tapped. Modifying data for protection is complex, but can be achieved with a little bit of sophistication.

However, all penetrations become ineffectual when data is totally meaningless to the opponent. Thus, encryption techniques are used when good security is required.

In its basic form, encryption is obtained by an algorithmic transformation of plaintext into a ciphertext. A key is used in the algorithm so that the

(Continued on In Depth/12)

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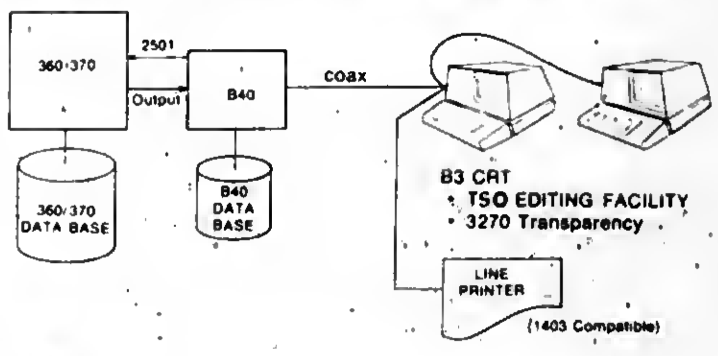

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IN DEPTH

(Continued from In Depth/10)

reverse transformation is feasible only if one has the key.

Encryption can be performed on a physical circuit between two pieces of equipment. In a packet network, this would mean that ciphertext would be turned back into plaintext in every intermediate packet switch point. Security would then depend on the potential access to the contents of a packet switch. Unreliable personnel or electromagnetic tapping might reveal data in transit.

A more secure form of encryption is performed end-to-end. In other words, ciphertext is sent to the data network and delivered as ciphertext to its destination. However, encryption cannot apply to packet headers because then the network could not carry them.

The security of an encryption scheme is based on the assumption that only the sender and the intended receiver(s) of a message have the key. Thus, there must be secure means to transmit keys and protect them.

A basic principle is that keys are never sent or stored as plaintext. They are also encrypted. When used, they are deciphered within a secure piece of equipment which cannot be tapped because of its specific design.

In the end, there must be a secure distribution of encrypting keys by courier or by diluting keys into masses of data transmitted through a multiplicity of independent channels that no opponent can tap altogether.

An encryption technique has been proposed for the simplification of key management. This scheme uses two keys, one for enciphering and one for deciphering. Let us call these keys P (public) and S (secret).

In order to send a message to Peter, anyone can use the P key, which is publicly known (like a telephone number) as being Peter's public key. Then the resulting ciphertext can be deciphered by whoever has the S key — and that person is Peter.

The reverse property of this scheme is no less intriguing. Let us suppose that Peter sends around a ciphertext resulting from his secret key S. The only way to get back the plaintext is to decipher with the P key, which is a proof that the message comes from Peter, because he is the only one capable of having produced the ciphertext with the corresponding S key.

Both properties may be superimposed to send authenticated messages to designated recipients. These messages may then carry keys to be used temporarily between two correspondents, using a one-key technique for each direction.

Frequent change of keys is a way to avert penetration. Thus, permanent keys are used to exchange temporary (or session) keys.

As protocols, encryption schemes must be commonly agreed upon to be usable. Standards are needed.

The only step in that direction so far has been the adoption by the U.S. National Bureau of Standards of the Data Encryption Standard (DES) proposed by IBM. A one-key scheme that uses a 56-bit key to encipher 64-bit data blocks, it was designed to fit in a chip.

Louis Pouzin is currently director of Project Pilotes at the Institut de Recherche d'Informatique et d'Automatique (Iria) in Rocquencourt, France.

Pouzin has served as director of Cyclades, an experimental computer network linking universities and research centers in France, and was also DP manager at Chrysler France.

His earlier experience included being in charge of Meteos, a real-time operating system for the French weather bureau, and working on the team which built the CTSS operating system as part of Project MAC at MIT.

Looking back.
And ahead.

All indications have it that 1978 will go down as another banner year for the computer industry. User spending for 1978 should at least match the IDC — projected $42+ billion, up 15% from 1977. Budgets in almost every major category show increased growth over 1977, and 1979 is shaping up to be a repeat performance.

Our December 25/January 1 Combined Issue Special Report takes a look back at the year in computers, as well as a look ahead for 1979. The *Computerworld* editorial staff will take a break from the holiday season just long enough to give you some hindsight and foresight on topics like:

- *The impact of inflation on computer use and configuration*
- *User-vendor relations*
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The secret to effective project management is a well-tuned organization, Toellner believes. Last week the developer of a project management system suggested the changes needed on the corporate, DP and user levels. This week he concludes by addressing the specifics of the project cycle.

Project Management: A Formula for Success

Part 2

By John D. Toellner

The project manager needs to concern himself with the scope of work for the total project, rather than just the piece that surrounds the computer. The quality of the estimate of a project's cost will largely determine the credibility of the project team when the work is complete. Schedule slippages and cost overruns plague most organizations. One of the major reasons for this is the absence of good estimating techniques.

A series of principles need to be considered in putting together an estimating process that works:

- The basic problem in systems and programming is that estimates are too low. Any technique must be capable of producing larger estimates.
- Estimates done at the detail level will always have more hours in them than estimates done at the summary level. Detailed estimating is therefore needed.
- Annotation of each line is essential to justify the source of the numbers.
- The estimating process is clerically tedious, and assistance must be provided to make any technique enforceable.
- Estimating teams (two to three persons) produce better estimates than a person working alone.

Any estimating process must of necessity closely follow the project life cycle. One approach is to create an extensive checklist based directly on the life cycle so that after an estimate is prepared, the estimates can be used by the project team to control the execution of the project work.

In preparing such a checklist, each individual work item and deliverable should be identified so the project estimator can establish the number of hours necessary to do each task, and, as a consequence, all of the project work.

When a detailed checklist of several hundred line items exists, senior people in the department can use their experienced judgement to create typical times for the length of each of these steps. These typical times help the estimator approach the estimating process in a comprehensive manner. Without guidance, the estimator can become frustrated by the line-by-line decision process.

Once the initial estimates using the checklists have been prepared, they need to be factored by consideration of key environmental factors that cause some projects to take longer than others. Some of the environmental factors to be considered are junior vs. senior project teams, knowledgeable vs. naive users, complex vs. simple systems, software newness and machine turnaround. Up to 20 meaningful factors can be identified. These factors cause plus or minus percentage adjustments to be made.

Once man-hours have been calculated through the estimating process, then converting them to dollars is a straightforward process if standard billing rates have been established for the department. Outside purchases and the use of outside resources, as well as computer time, are usually added to the labor cost estimates.

When using standard checklists, it is significant that the project manager be permitted to remove from the checklist any items that do not apply to his project, but at the same time is obligated to write in the tasks unique to his particular piece of work. The result is an estimate based on the actual work that will be performed.

It has been my experience that the best estimates are produced by estimating teams comprised of the project manager, one senior analyst and hopefully a key user so users can see why systems take so long to implement. Considerable discussion on each checklist item takes place, resulting in an estimate that is well thought out.

I am familiar with more than 40 firms using the approach described here, and these firms have reported that the estimate vs. actual comparisons have been in very close agreement. Currently under consideration is a project to create a nationwide data bank of estimating times to validate the typical times to execute each task. This project is possible because each of the firms use checklists that are quite similar.

Project managers cannot be expected to immediately know how to use the estimating process, so a training course is essential. A daylong course that is workshop-oriented is recommended to make sure that each person who will have estimating responsibilities can demonstrate his proficiency.

Estimates cannot be "frozen in concrete" at the beginning of the project and left unchanged when the scope of the project work changes radically. At major milestones in the project life cycle, a new estimate must be prepared when better data is present on what the user *really* wants and after some of the design work is complete.

Logical points in a life cycle are after the feasibility study, preliminary design (external) and program design (internal). If the new estimates are substantially larger than the latest approved amount, then management approval of the new budget is needed.

An estimating process normally produces man-hours or man-days of the analyst/programmer time needed to perform the necessary project work. How does one decide whose hours to include in the estimate? It must be the same as the time-reporting system in existence.

For example, if it is the practice of the organization to have users charge their time against the project, then the estimating process must estimate user time. If, on the other hand, users never charge for time, then this time should be not included in the estimate.

Once the man-hour estimate is in existence, the manual scheduling of each individual on the project team should take place up to the project's next major milestone. The manual scheduling process requires hard thinking on who is qualified to do which task, the sequences in which the task must be done.

When the manual scheduling process is complete, then the project information is ready for input to a piece of software, if one is present. If project control software is used by the organization, the fine tuning of a project plan by the software can be accomplished quite rapidly. The software's great strength is that as changes take place on a weekly basis, it can very rapidly update the schedule with a minimum amount of effort required from the project manager.

One of the major difficulties for the planner of project work is to effectively communicate what he has in mind to those who will execute the work. This is a real communications challenge and is often underestimated.

(Continued on In Depth/16)

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(Continued from In Depth/13)

A substantial amount of hourly and daily supervision by the project manager is required to make sure that people understand what he is asking them to do and that they are headed in the right direction.

The planner is normally the estimator, and one specific output of his process is the detailed checklists which were used to create the estimates. These checklists identify the work items and deliverables the planner assumed would be produced when he put his estimate together. What is needed, then, is written material to hand to the project team so the project manager is freed from the hourly and daily supervision that is necessary if items are handled orally.

The term I use for this detailed, task-level guidance is "performance standards". A performance standard should exist for each task in the standard project life cycle, and it should be supplemented by summary descriptions of tasks that are written in or added to individual projects by the project manager.

The guidance material for senior personnel should be quite succinct, as it is safe to assume they will understand how to produce a high-quality end result when not much more than the task's deliverables are shown to them. For intermediate and junion personnel, however, more procedural guidance is essential if they are expected to produce what the project planner had in mind.

It has been my experience that including in the performance standards a series of specific forms that are easy to complete simplifies the communication of what to do. The advantages of a forms orientation were discussed last week.

Another important component of a good performance standard is an example for each of the deliverables the planner is asking the project team to produce. Development of examples is quite difficult, but pays good dividends, especially in communicating the level of detail expected by the assigner of work. I have had many years of experience in writing procedures for managing project work, but I have never found a better vehicle to communicate how detailed something should be than to provide the individual with an example.

The performance standards cannot be expected to convey the expected quality of a particular design. The most one can hope for is to guide the process used to produce the end result and the format the end result takes. If the performance standards accomplish these functions, then an experienced individual looking at these deliverables can quickly assess whether the design thinking behind the deliverables was appropriate.

Measuring Performance

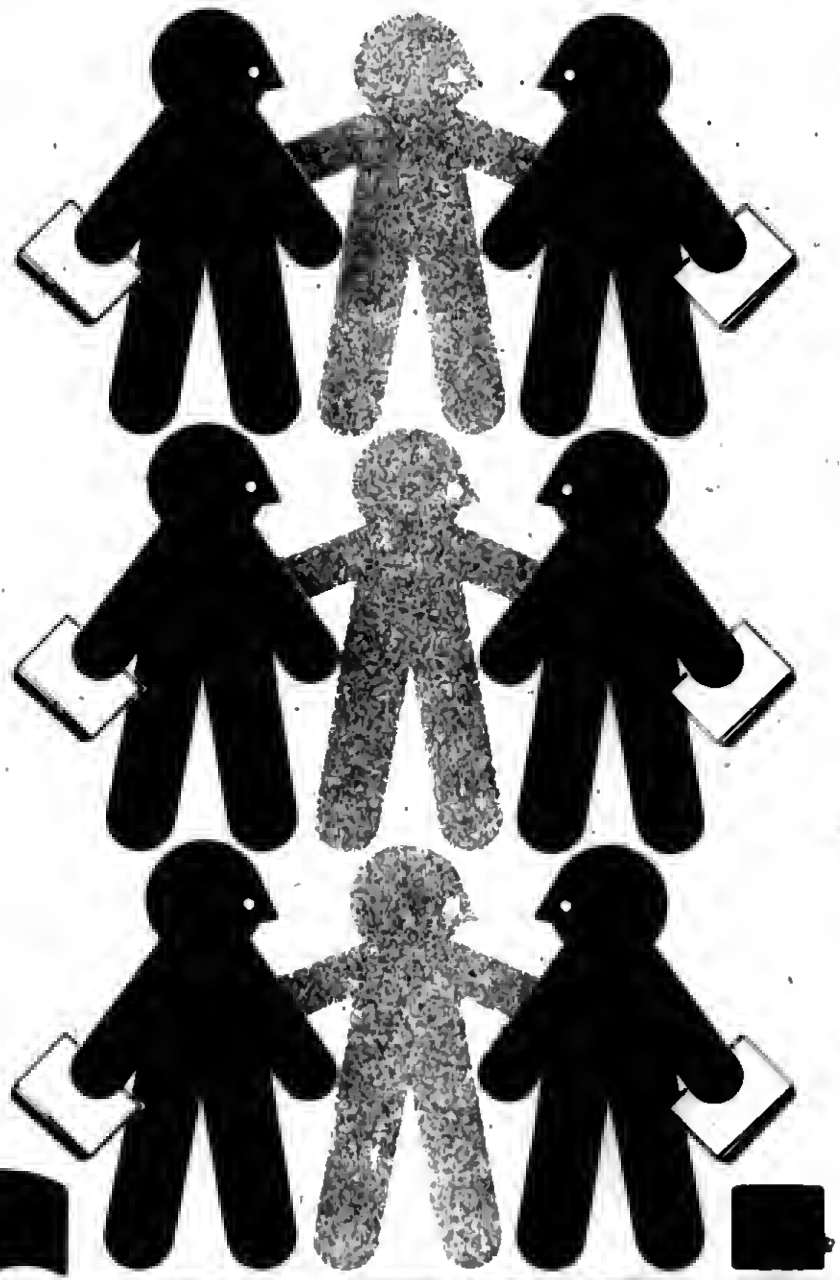
Many organizations today are becoming increasingly concerned with performance measurements to get a better handle on the productivity of their staffs. When conventional industrial engineering approaches are applied to data processing, we find the individuals most rapidly going to the keypunch department, followed by the program coding. The reason for this is that these are the items most easily measured.

What is needed, I believe, is a performance measurement for all the tasks in the project life cycle, not just for those which are easy to measure. Unfortunately, many of the tasks do not produce the kinds of deliverables that can be counted, so we must turn to some other approach if we wish to measure performance.

When we talk about measurements, three variables are required: time, cost and quality of the work. By time, we wish to measure whether a project will be completed in an established calendar period. Cost refers to the man-hours and dollars consumed. The quality is involved with the workability of the end deliverables of the project work.

The ability to measure an item is directly related to the existence of a quantitative measure prior to performing the work. Performance can never be measured unless the actual result can be compared to a plan that was prepared before the work began.

To measure the performance of the resources used on the project, it is necessary to have an estimate of man-hours (or dollars) and a weekly time-reporting process which feeds back the



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number of hours or dollars that were actually consumed. By making comparisons at the task, subphase, phase and total project levels, we can monitor the performance of a project team in regard to its budget.

By using scheduling techniques that utilize the estimated man-hours, the calendar dates when each of the key milestones of a project are expected to be reached can be developed. A progress-reporting procedure that reports when milestones are actually reached permits the measurement of the project team in regard to schedule performance.

When performance standards exist to describe the approach to be taken and the appearance of each task's end result, then the actual deliverables can be matched against these standards to see if the quality of the system is acceptable.

Therefore, in summary, we can see that performance measurement requires the development of a detailed man-hour estimate, a calendar schedule when each of the major milestones are reached and a set of performance standards that identify what acceptable deliverables will look like. A weekly time-reporting system, a weekly progress-reporting procedure and the availability of the actual deliverables are needed. By the use of these information flows, it is quite possible to get very realistic measurements of the budget, schedule and quality of all the systems work. Good historical records permit the measurement of performance of individuals and of the group as a whole.

Capturing User Requirements

It is my opinion that the thorough and careful documenting of user requirements is the single most important series of tasks in any project life cycle. The appearance of "user changes" during the detailed work such as programming are often really requirements that were missed, rather than users who changed their minds.

If user requirements were 100% documented at the beginning of the life cycle, the design process, although challenging, would be a very straightforward matter. Further, good user requirements eliminate the need for a rash of enhancements that pick up items missed in the original project.

In capturing user requirements, two basic assumptions are made:

(1) The user, down deep, does know what he wants in the new system.

(2) The user has no organized process for documenting his requirements in a form the systems function can use.

These assumptions pose a substantial challenge for communicating, and it is unrealistic to expect all user organizations to simultaneously improve in the near future. As a consequence, the burden falls on the systems group, which must improve its communications skills so comprehensive and meaningful requirements are reduced to writing.

It has been my experience that user requirements can be successfully captured in a series of four steps. Step 1 is a process dedicated to educating the analyst, who is responsible for capturing the requirement. He needs to study documentation on the current system, be it manual or automated, and to spend enough time in the user organization to ensure that he thoroughly understands how the user does his business.

Step 2 involves the preparation of a highly detailed checklist of every feature, function and transaction that he anticipates the user might require. If an item is not on the checklist, it will not be discussed and a requirement will be missed. This checklist, which will be used as an interview guide for the next step, needs to be reviewed with the user prior to execution.

(Continued on In Depth/18)

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IN DEPTH

(Continued from In Depth/17)

Step 3 involves detailed interviews, with a substantial volume of information generated by the user and documented on the spot. Each item on the checklist is turned into a question and the user is asked how he wishes the new system to respond when that function occurs. His response is recorded and fed back to him.

If the understanding was inaccurate, the user corrects the interviewer on the spot. The interview proceeds item by item, resulting in a paragraph of specification of the user's needs for each item on the list.

Step 4 is the process of editing the requirements captured in the interviews, which often contain duplications and incomplete thoughts. The editing is followed immediately with a detailed paragraph-by-paragraph review with the users to make sure they both understand and are committed to every paragraph of the documented requirements.

It is recommended that, at the end of the life cycle, the project manager demonstrate to the user how the system handles each of the requirements. The requirements tell *what* is required. The design determines *how* it is handled.

With well-documented user requirements, the project team seldom hears complaints that unwanted features show up in systems while important items are omitted.

Conventional Methods Ineffective

My experience in dealing with a large number of systems and programming groups indicates the time has come when the emphasis on user involvement in projects has matured to a point that it can be considered an absolute necessity. Once an organization comes to the conclusion that this involvement is both needed and desirable, the challenge is to create a structure that will cause it to take place all the time.

Conventional methods for involvement are generally only partially effective. Often, full-time users are assigned to projects, either as project managers or as team managers. This can be a bit awkward at certain times during the project life cycle — for example, when the work content is much too technical to permit the user to participate and he feels lost.

Having top executive managers review the projects on a weekly or a monthly basis is also awkward. The project team invests a substantial percentage of its time in preparing for these meetings, and the top managers are often not prepared to apply experienced judgment on redirecting the design effort.

In short many of the processes used to involve users do not work too well.

Regular User Reviews

To accomplish a more practical level of user involvement, I assume that a project life cycle has been established which defines the tasks necessary to create all the project work and that each of the tasks produces some form of deliverable that can be examined to show how the design or administrative activity is unfolding. User-oriented reviews can be inserted at key points in the project life cycle.

A practical way to set up these reviews is to take the deliverables that occur in the project life cycle and cluster them into a series of batches that end at the key milestone points in a project. For example, after capturing

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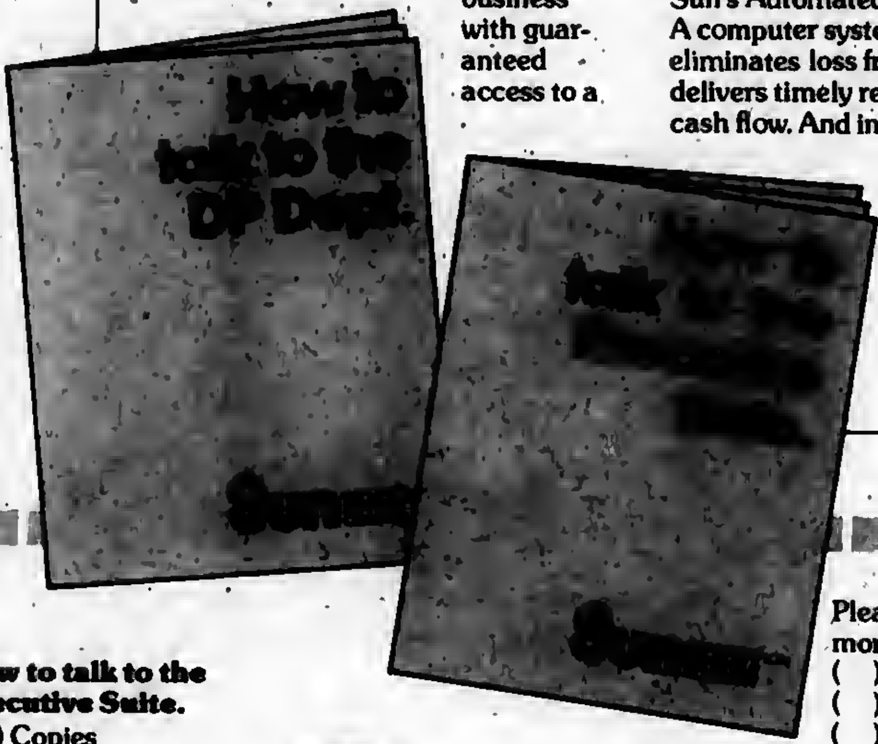

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the user requirements, a logical milestone has been reached; at the end of the feasibility, or advisability, study, where alternative approaches have been identified, another logical milestone is reached. Others can be identified during both the design and implementation phases.

If a quality review is structured at the end of each batch of work, it will be observed that many of these reviews contain materials that are easily understood by the user and, as a consequence, his active participation is practical. The quality review process, then, becomes an ideal vehicle for accomplishing active user involvement on all of the activities of the project with a minimum expenditure of the user's time. This is a very desirable combination.

Once this review process is set up, authority must be given to the user reviewers to block the project's progress if — as evidenced by the deliverables — the deliverables do not satisfy the agreed-upon requirements. The project team must redo the deficient results. Memo reviews tend to be ignored.

Typical Decisions

The typical decisions in which users participate involve making sure:

- The scope of the requirement is practical and unnecessary and expensive features are not being added to the system.
- The better broad project alternatives (whether to go batch or on-line, for example), have been thoroughly evaluated and the most practical alternative chosen.
- All the inputs and outputs of the system are appropriate and the specifications for creating the design do, in fact, include all of the agreed-upon user requirements.
- An implementation plan has been established.
- The user manual contains clear material.
- The users will be adequately trained for their new role.
- The systems test is thorough and can flush out any flaws that might exist before the system is turned on.

With active involvement in the review of the deliverables for each of these important activities, the user can make sure his interests are protected while spending a minimum amount of time associated with the project.

The Enforceability Issue

In considering enforceability in project development, a very delicate line must be trod. Systems analysts and programmers are professionals, and the process cannot be so rigorous that they feel like they are being treated like clerical personnel.

On the other hand, without an enforceability structure, the key activities in the development of systems won't happen, and the organization will end up with badly designed and badly documented systems. What is a workable compromise between these two extremes?

In designing an enforceability process, the first question to face is, "What do we want to enforce?" I think three significant items are involved. The first is to make sure the standards of the department are being used. This includes design standards, such as top-down or structured techniques, and documentation standards that call for a consistent way to document the results

(Continued on In Depth/20)

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IN DEPTH

(Continued from In Depth/19)

of the design work.

The next issue is quality — to make sure that the design that is unfolding is true to the user requirements and that the creation of a technically efficient system is happening.

The third item is to ensure that project planning is taking place so management gets accurate information on how much the system will cost and how long it will take to complete.

Once we have decided on what we are going to enforce, then we must face up to the question of how we are going to make this happen. My suggestion is that the work in the project life cycle be batched, with each batch containing a series of logically related tasks so the project can progress batch-by-batch through the life cycle.

By having each batch conclude with a meaningful review, the project manager can withhold the release of the next batch until he is certain the deliverables produced by the previous batch are acceptable. This release mechanism becomes a simple but effective way to accomplish the mechanics of enforceabiltiy.

Essential to making the whole process work is that the individuals performing the quality review be given the authority to block the project's progress and send the project team back to the drawing board to correct deficiencies before the project manager releases the next batch of activities. The quality review process then becomes the key element in the enforceability scheme.

Because of the importance of the quality reviews and because of the policy that work not progress to the next batch until the previous batch is approved, an auditing process by the DP management is essential to make sure these quality reviews are functioning. If the quality reviews are properly functioning, then the enforceability process will take place.

Design Freezes

Another key item needing enforceability is design freezes. Design freezes are generally recognized to be helpful to the DP team, but they are often viewed with great suspicion by the user.

To make a design freeze process practical, it seems obvious that thorough user requirements must be developed and approved by the users early in the project life cycle. If it were possible to capture 100% of the user requirements at the beginning of the life cycle and then to assure that each would be included in the design, then issuing a design freeze toward the middle of the life cycle becomesd a practical matter.

If the user requirements are either nonexistent or incomplete, design freezes become impractical because they lock out essential features of the system.

One of the major reasons for schedule slippages and cost overruns on projects is that additional features and functions are introduced to the systems design as deep in the life cycle as detailed programming or, worse still, during implementation. Design freezes provide a way to identify the add-on requests so they can be treated as follow-on projects after the original project has been put into production.

I believe the design freeze should occur approximately at the 50% point in the expenditure of project funds, which is usually where all of the externals to a system have been designed and agreed upon, but the program design and programming activity has not yet started. At this point all the user-oriented facets of the design are complete.

Two-Level Freeze

It is often practical to issue the design freeze at two levels. The preliminary design freeze, which occurs a bit earlier than the final freeze, requires that major features and functions not be considered a part of the current project but, instead, as follow-on projects if approved by the management group.

The second design freeze suggests that nothing other than trivial details be added to the project once this freeze has been issued.

After the design freeze, if the user wishes to demand it, it is perfectly acceptable for the project manager to stop his project and estimate the balance of the work including the requested changes. If the sponsor of the project is willing to add the dollars and the calendar time to incorporate these changes, then the project manager

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should be quite pleased to proceed with the larger scope project. The key element here is that the budget and schedule must be consistent with the scope of work to be performed.

I have found that design freezes announced well in advance are accepted by both the user community and the project team, eliminating one of the major reasons why projects often come in over budget and late. The enforceabiltiy is keyed to the quality reviews and poses no problems.

Staff Training

Every organization recognizes the need to train its analysts and programmers to gain the skills necesary to do a professional job in the building of new systems. However, it is often difficult to be precise on exactly the type of training that will best prepare each individual to perform the needed work. Training needs fall into the two general classifications of short-range and long-range.

Short-range training needs are most frequently identified by the project manager when he compares the skill level of people assigned to him with the tasks that he is asking them to execute. The speediest method is to merely ask the individual whether he feels comfortable in executing all of the work items requested of him by the project manager.

If the individual answers that he does not feel adequately trained to carry off the work assignments, the project manager is responsible for initiating appropriate action to see that the training takes place. This process should be repeated at each stage of the life cycle.

Longer range training identification is often done by the training director or coordinator, and again it is useful for him to examine all of the tasks in the project life cycle by broad groupings to identify the skills needed of the analysts and programmers on the staff. In addition, it is anticipated that he will perform a skills inventory of each individual on the staff and lay out individual training programs to bring staff members to the level of professional proficinecy that permits them to develop high-quality systems.

The alternatives for accomplishing the training are varied and depend on the size of the organization. For a larger group, in-house instructors frequently represent an effective way to accomplish the training because specific courses can be tailored to the unique requirements of that one organization. This assumes the individual instructor is skilled in modifying and teaching the courses.

In addition to in-house training (or in lieu of it, if the organization is smaller) are the audiovisual training courses. These courses have the advantage of allowing an individual to be provided with training as it becomes available. Courses range from one day to one week.

When individual training profiles are developed, this type of course becomes highly desirable because the individual can fit the training into his project work schedule and not have to wait until group courses are scheduled.

Supplementing the previous two methods are the open seminars and institutes which are advertised in trade journals and other media. Often these courses, given by important people in the field, are motivational and extremely helpful in raising the professional level of the people on the staff.

The basic payoff from training is that it is usually far cheaper to enhance the skill level of someone who is already a dependable employee than to go outside to try to hire already trained individuals. This process also offers the ability to build a solid staff trained in the specific skills the management of your organization considers to be most important.

Postinstallation Audit

Upon the completion of the systems development project, it is considered desirable by most organizations to conduct a postinstallation audit to confirm the results of the project work. At a later time, a second audit will measure whether the system is providing the benefits promised when the funds were allocated as well as whether the system is performing as anticipated.

The use of audits in DP will parallel how an organization checks on expenditures in other areas. If audits are part of the management style, then conducting them for systems projects will be a worthwhile event. If audits are not

(Continued on In Depth/22)

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(Continued from In Depth/21)

considered important, it is doubtful that the effort put into one will yield many benefits.

The ability to conduct a meaningful postinstallation audit is dominated by the care in which the benefits and objectives of the project were documented at the beginning of the project life cycle. Many organizations prepare a document called a project proposal at the beginning of the life cycle which describes the tangible and intangible benefits anticipated if the system is created and also provides an overview of the system's objectives and operation.

The benefit section of this document becomes one of the primary inputs to the postinstallation audit process. Oversimplified, the objective of the audit is to measure whether the things that were promised actually came to pass.

Immediately upon completion of the project, the audit attempts to determine whether parallel operation (or other methods used to initate the system) produced acceptable results and to document the complete cost and schedule performance of the project work. Any deficiencies in the parallel operation or budget adjustments that are necessary are handled at this time.

Approximately six months after the end of the project, the audit is performed to measure whether the benefits actually resulted and whether the users are operating the system in the manner in which it was designed. The audit starts with the gathering of data on the costs and benefits of operating the system, and information is gathered by observation and interview on the manner in which the system is used.

The evaluation period in the audit condenses the data that has been gathered and compares the actual benefits and system operation with the objectives and anticipated benefits documented in the project proposal and in other portions of the project life cycle. The result of this process usually is captured in a report displaying the results of the audit.

It is important that the audit be received by a management level high enough to initiate corrective action if necessary. In many instances, the audit report will stimulate the preparation of a work request for a follow-on project to remove deficiencies that were uncovered.

If the management of the organization sets the priorities at a high level for executing this follow-on project, then it can be expected that the system operation will be promptly corrected.

Written audit guidelines are very helpful to the person who conducts audits only from time to time.

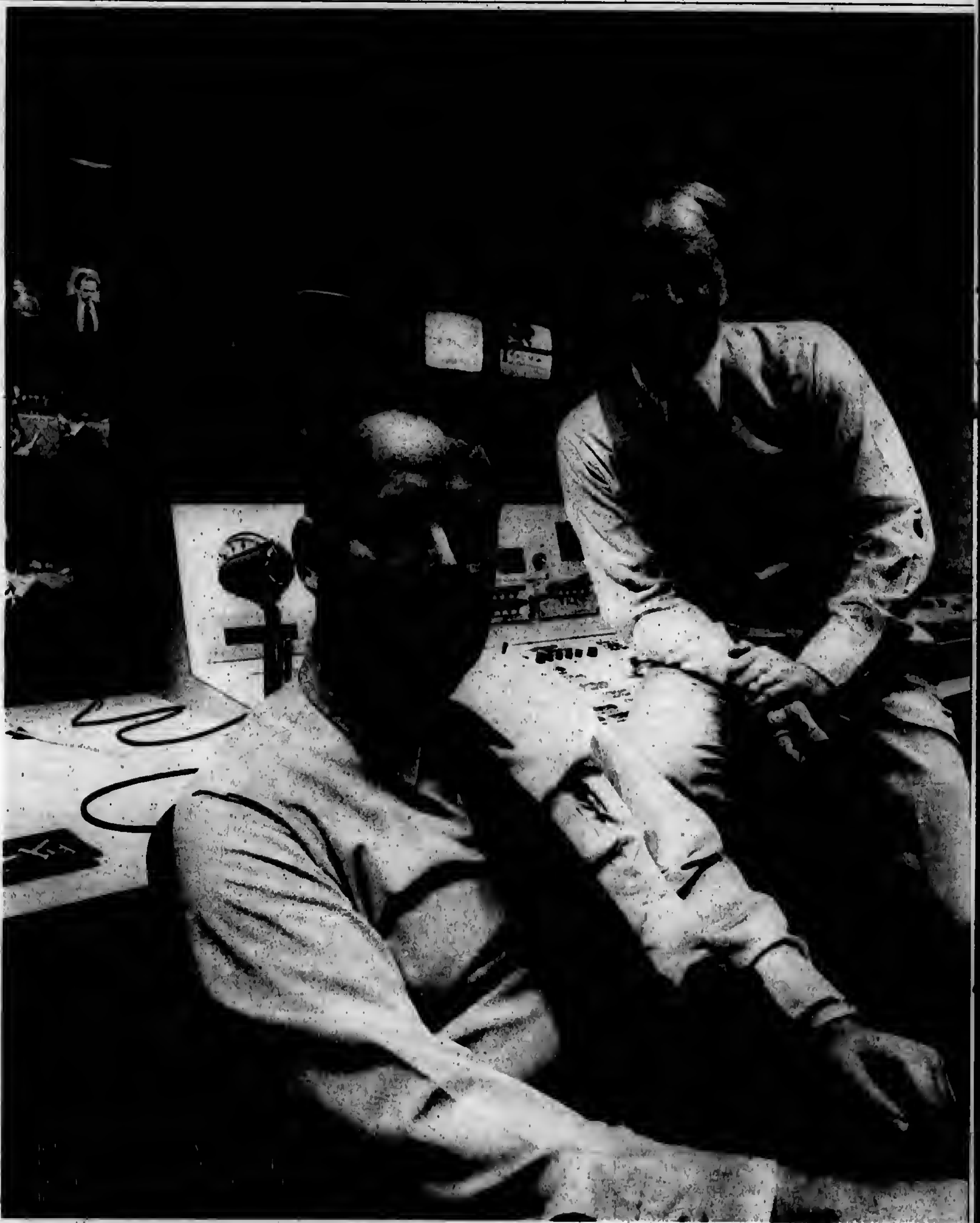
Project Management Methodology

Good project management needs a special environment and the right materials so the implementation of its methodology will be accompanied by organizational changes. If an organization has not yet split its analyst/programmer group into two sections so one group concentrates on larger development work and the other on small projects and maintenance, then I urge each organization to do so. The separation of the staff also facilitates a very logical structure for management priority-setting.

This priority-setting structure creates two levels of review committees. The upper level, composed of more senior user management, considers work requests greater than a certain level, such as $20,000, and normally meets quarterly to rank these requests, which is a very workable way of setting priorities. This list creates an unambiguous direction on which projects to start next. Procedures and training are needed for this process.

For all requests costing less than $20,000, a second committee normally meets monthly to put them into rank sequence. It is recommended that anything smaller than one man-day and true emergencies bypass this priority-setting scheme. The resulting list gives positive direction to the persons specializing in this class of work. This process also needs procedure.

How operations and maintainance documentation is to be stored becomes an important issue in implementing a methodology. The turnover of documentation is most efficiently done if it is batched by the development team in identically the same arrangement as it will ultimately be stored in the computer operations or maintenance areas.



If the organization has not yet decided how to finalize the storage, then it is important that it do so. Existing documentation may have to be repackaged.

Having all work arrive on a written work request form is an essential ingredient to the project management process. Once the work request comes in, then a screening function makes sure the request is understood and judges the size of the job. This is followed by the appropriate approval, depending on the size of the requested work. All of this activity needs to be proceduralized.

Putting in place a set of estimating guidelines is also of prime importance, as is training the staff to use the chosen estimating techniques. Once the estimating process has been installed, an organization is better prepared to accomplish the primary goals of any project management system, which are to bring the project in on schedule and within budget.

Installing the time and progress reporting system is obviously a key element. Many larger organizations choose to purchase a piece of software capable of collecting times and producing reports that compare the actuals to the plan times coming out of the estimating process. If an organization is not large enough to utilize software, then a manual reporting system must be created and implemented.

Progress reporting on the status of projects needs to be initiated so that DP and user management is periodically informed of where things stand. The management that is denied information tends to believe rumors.

The information that gives this status reporting visibility is the estimated hours; the scheduled dates and the actual hours and completion dates. Narrative reports are also needed because numbers alone do not tell what is happening.

Starting Point

Because of the far-reaching impact of methodology, the ideal starting point for introducing it is to secure top management commitment to a series of items:

- Agreement that the data processing procedures can be used to implement the process.
- Agreement that management will participate in setting priorities on the backlog and monitor active projects.
- Agreement that management will issue policies to ensure user participation in projects, to prohibit bypassing of the priority-setting processes and to give the needed authority to the quality reviewers.

Another key beginning task is to prepare a detailed plan for implementation that spells out each item to be performed, who has the responsibility for it and the date on which the results of the task are due. The DP management team should be prepared to monitor the actual progress according to that plan.

If the implementation is split up into a series of clusters of functional tasks, then a review of each cluster can be meaningful.

It is important that the planner of project work be able to instruct the project team on what he had in mind when he chose particular items and assigned particular man-hours. Performance standards, which are normally created to assist the intermediate and junior personnel in the department in the execution of the various tasks, can provide this guidance. The task of creating (or customizing) the standards (man-months) if a project management methodology package is to be purchased (man-days) is a serious activity and needs to be done in a professional and expeditious manner.

Once the proper materials, appropriately customized, have been put in place, then the time has arrived for training the staff to execute the project management methodology. The project manager is the recipient of the majority of this training because of the key leadership role he plays, providing direction to the project team on the things to do while the project is passing through its life cycle. One to two weeks of directed training is needed for the project managers.

A byproduct activity that takes place in the training is the "selling" of the methodology to the members and staff. A senior instructor conducting classes for a number of days tends to add validation to the methodology.

A logical introduction to the method-

(Continued on In Depth/26)

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Mike Jones
Assistant Vice President and General Manager
Jefferson Data Systems

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Sycor has always played a key role at JDS. Initially, Sycor 340 and 350 systems formed the nucleus of each station's remote capability. As service demand grew, Sycor 440 systems were deployed. Now, Sycor's most powerful equipment, the new 445 with multifunctional operating software, has been successfully tested and is scheduled to be installed.

"We wanted to provide our clients with equipment that performed without making computer people out of them."

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Information is then telecommunicated directly to Jefferson Data's central computer, where it is processed and stored. Processed information is periodically returned to each of the 440 systems over undedicated telephone lines, for generation of program scheduling, contracting, invoicing, and general accounting reports. In fact, the JDS System 80™ package produces over 100 reports for subscribers.

"People have been freed to perform additional tasks."

"Before Jefferson Broadcasting obtained the Sycor systems, at least three or four people per station were required for writing up contracts, and editing the log while moving commercials around. The Sycor systems have automated this entire process. In addition, they have allowed us to tighten operations. Before, six to ten percent of our annual billing was 'falling through the cracks.' And with 30-second commercials costing as much as $20,000, losing one was a very expensive proposition. Now, once data is entered into the system it is never lost.

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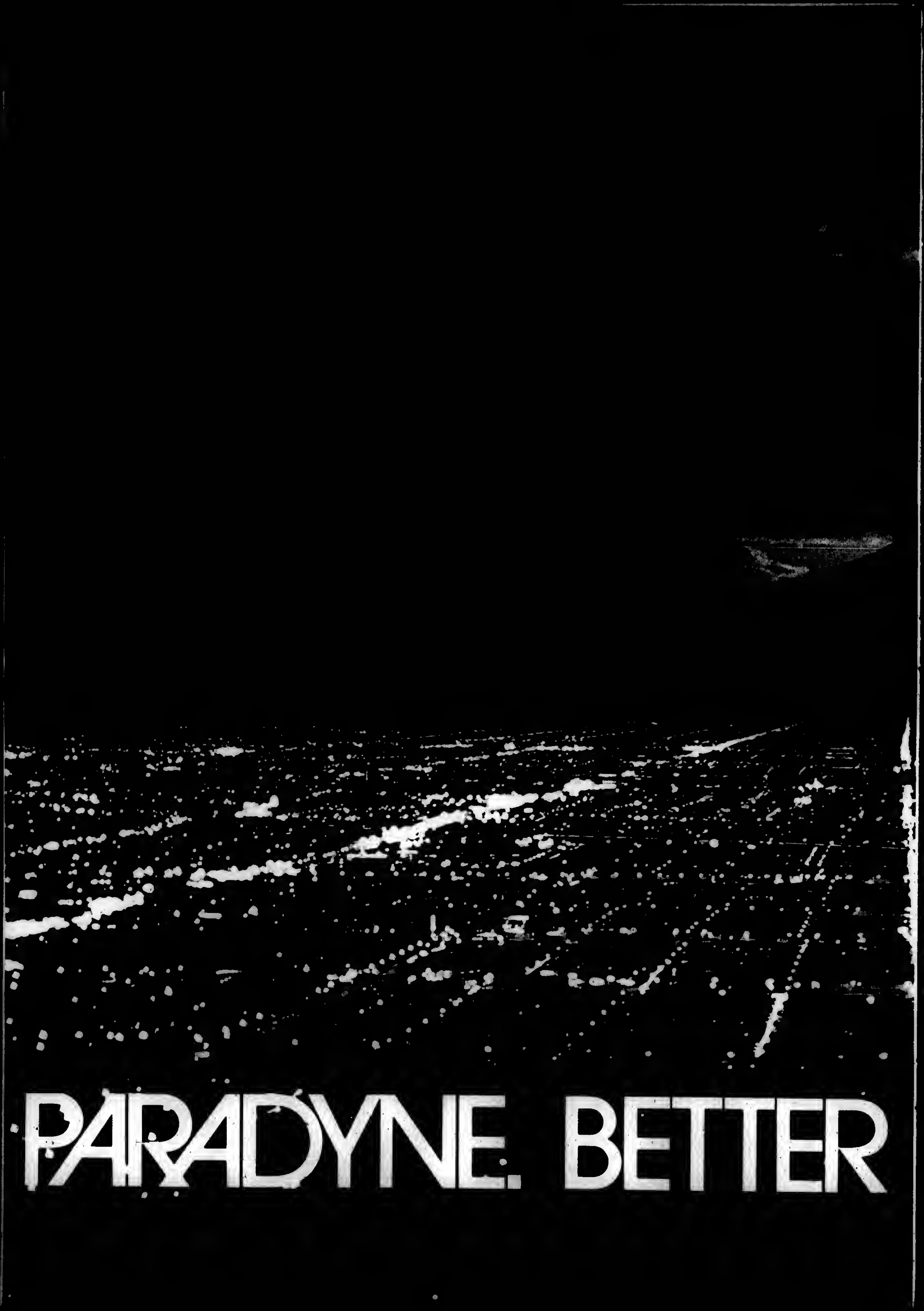
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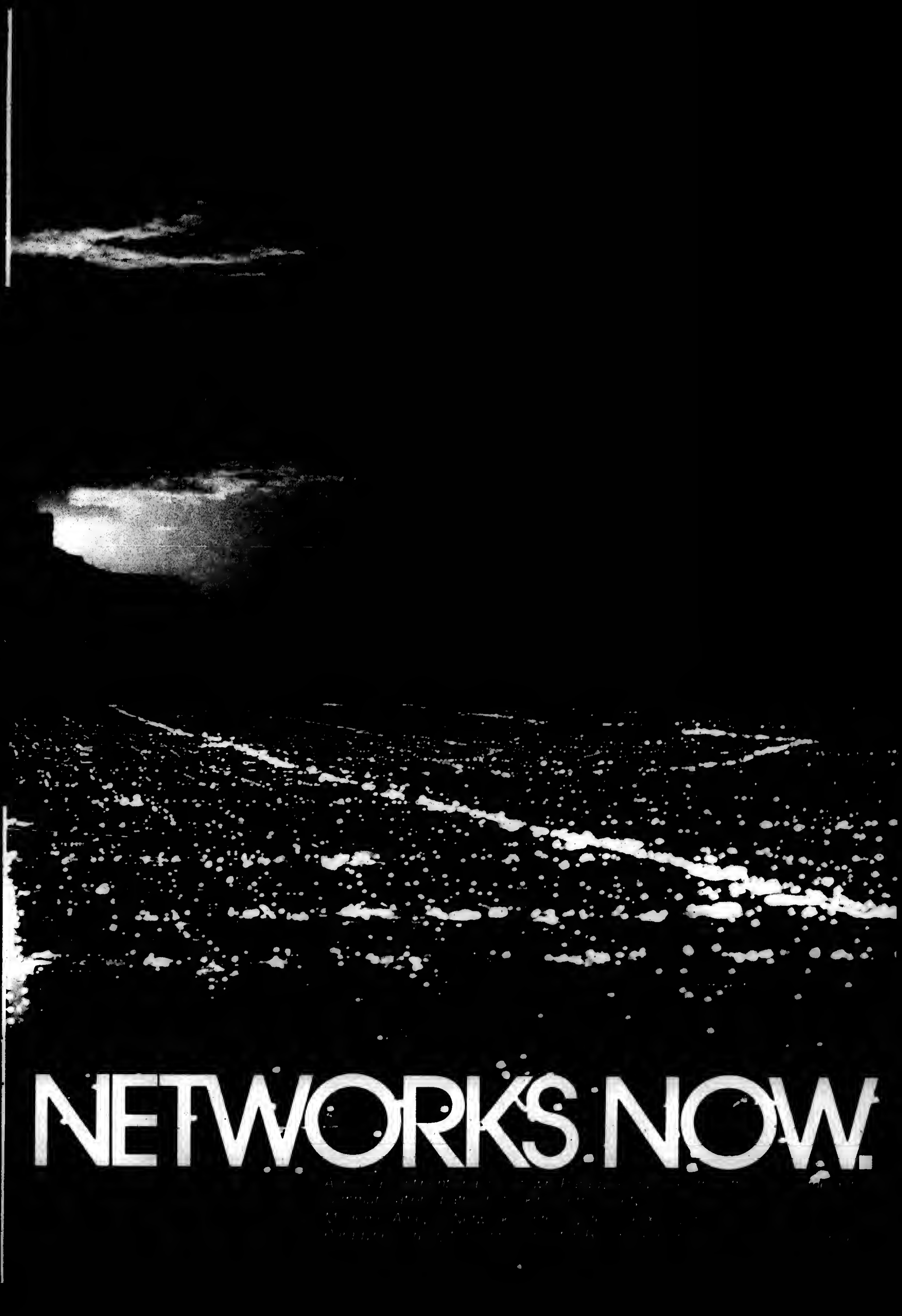
NETWORKS NOW.

(Continued from In Depth/23)

ology is to use it initally on a few pilot projects. Even though the methodology was created internally and sounds completely logical to the architect of the system, in actual use differences do crop up.

It is wise to understand them before attempting to impose the process on all members of the staff; once staff resistance is encountered, it is difficult to make it go away.

It is strongly recommended that a separate administrative person — a project control administrator — be appointed to watch over the methodology and to keep its contents up-to-date.

The introduction of a methodology introduces a bit more structure into the department's operation, and accompanying this structure are administrative activities, questions and challenges and new policy issues. Unless these activities are taken care of properly, the implementation of the methodology can get in trouble.

The presence of a separate administrative person can be quite critical. It is important that this individual be given adequate training to permit him to appropriately execute his responsibilities.

Special Effort Needed

Setting up the administrative process takes a special effort. This includes such jobs as initiating a work request for all jobs currently in the shop, preparing backlog schedules, getting time sheets introduced and setting up status records. Each of these items takes time, and it is important that the setup be complete.

Starting the management priority-setting requires great skill and careful preparation. The composition of the priority-setting boards needs to be set, an orientation meeting, a practice session and a "live" session usually gets the process operational so the management group feels comfortable in its role.

It is important that this process be translated into management terms so the lack of familiarity with DP will not restrict the executives from active participation.

Objectives to Reach

A methodology can be considered to be firmly in place when the following objectives have been reached:

- The management group meets periodically to set priorities on proposed projects and feels comfortable in its role.
- The staff is trained and has in its possession the needed standards and procedures.
- Documentation is turned over in a completed status and kept up to date.
- Accurate status reports are produced on a timely basis for each project.

John D. Toellner is president of Spectrum International, Inc., formerly known as J. Toellner & Associates, the developer and marketer of the Spectrum project development system.

Toellner has 27 years of industrial experience; the last 15 years have been spent in DP-related consulting.

The author holds a B.S. in mechanical engineering from the University of California at Berkeley and did two years of graduate study in operations research and computers.

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DALLAS INTELCOM 79

Entry-Level System Built On Disks by Basic Four

SANTA ANA, Calif. — Designed for companies making the transition from manual accounting methods to computers, Basic Four Corp.'s newly introduced System 410 is a multiterminal, programmable business computer that offers users low-cost disk storage and increased system memory, according to the firm.

The system's base configuration consists of 40K bytes of system memory, a 14M-byte disk storage system, CRT terminal and a bidirectional printer. In addition to on-line storage, the system utilizes a magnetic tape cartridge drive with a removable 9.2M bytes of storage for backup and off-line storage, a spokesman noted.

The system's maximum configuration includes 96K bytes of system memory, 42M-byte disk storage system, 9.2M-byte tape cartridge, eight CRT terminals, two serial printers and two line printers. The system reportedly supports 150-, 300- and 600 line/min printers.

The System 410 will compete with a myriad of products now on the market, according to the spokesman, including the IBM System/34, Burroughs Corp. B80 and B800, NCR Corp. 8230 and 8250 and Wang Laboratories, Inc.'s. WCS-30. Also in competition will be Qantel's Model 950, Microdata Corp.'s Vantage, the Data General Corp. CS/40 and the Digital Equipment Corp. 320 and 350.

Winchester-Type Disk

Ease of installation and operation are the major attractions of the system for a first-time computer user, the spokesman claimed. The system's fixed, Winchester-type disk allows upgrading at a cost lower than competitors can offer while keeping data on-line, he asserted.

In addition, the system's 9.2M-byte magnetic tape cartridge offers twice the storage capacity of a disk cartridge at a quarter of the cost, according to the spokesman.

The System 410's CPU is a microprogrammed computer designed and manufactured by Basic Four. The Basic Operating Software System (Boss) utilizes 32K bytes of protected operating system memory and 8K bytes of user memory, the spokesman said.

Boss consists of a disk-oriented, real-time executive and an interpreter for executing the business Basic language.

The System 410 utilizes a 14M-byte fixed-disk drive enclosed in the CPU console. The drive can be upgraded to 28M or 42M bytes.

An associated controller contains a microprogrammed processor that performs selected error checking and correcting routines, as well as controlling data transfers between the CPU and the disk drive, the spokesman said.

The Basic Four Corp. System 410 incorporates a disk storage system, CRT terminal and bidirectional printer.

Equipped with a standard typewriter keyboard and 10-key numeric station, each of the System 410 CRT terminals has a capacity of 24 lines of 80 char., the spokesman said. A total of 1,920 char. can be displayed at one time.

(Continued on Page 54)

Prices Cut

TORRANCE, Calif: — Randal Data Systems, Inc. has reduced the prices of most of its small business systems and at the same time upgraded its standard 960-char. CRT console to 1,920 char. while cutting its price.

Price reductions of $1,000 per system apply to most of the Randal 240, 540 and 550 system configurations, according to a spokesman. Their base prices, which include a desk, a CRT with numeric pad (three CRTs in the case of the 500) and a printer are now $23,900, $44,800 and $51,800, respectively.

The 1,920-char. console now costs $1,900, $800 less than its former list price of $2,700. The latest price is $500 below the cost of the 960-char. console, which sold for $2,400.

Randal is located at 365 Maple Ave., Torrance, Calif. 90503.

Dual-Processor Model of Syfa Offers Complete Redundancy

IRVINE, Calif. — A dual-processor version of Computer Automation, Inc.'s Syfa network processing system that was designed to provide complete processor redundancy has been announced by the firm's Commercial Systems Division.

The Syfa Cloned-Processor System (Syclone) includes a primary processor, a backup redundant processor and a switching station. The redundant processor is an exact duplicate, or "clone," of the primary processor, according to a spokesman, and the switching station transfers control of peripheral units from the primary processor to the redundant processor in the case of processor failure.

The Syclone system allows the user to configure a backup system without purchasing two sets of peripheral units, the spokesman said. One field-test user claimed the backup system was more economical than maintaining a large field service staff, he added.

CA's Syfa competes with Digital Equipment Corp. PDP-11/30 through PDP-11/70, the Hewlett-Packard Co. 3000 series and cluster terminals from IBM as well as its 8100 series and System/38, the spokesman said, adding that he didn't know if those companies offer redundant processors.

The Syclone system was built for "critical applications" in business environments. "If a problem should occur in the primary processor, the system operator unlocks a master key switch on the switching station and presses the appropriate button," the spokes-

(Continued on Page 54)

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Mini Totaling Bills for Cabs' Charge Customers

By Marguerite Zientara
CW Staff

NEW YORK – Hailing a cab in the rain in New York City isn't always possible – unless one is a credit customer of the United Taxi Owners Guild (Utog), which is using a minicomputer to tote up the monthly bills for those customers.

Since it acquired the mini, Utog has cut from about two weeks to a few days the amount of time it takes to handle end-of-month accounting functions.

Utog claims 200 cab driver members and thousands of credit customers from such institutions as banks, publishers, financial firms, law offices, accounting firms and the phone company. Utog charge customers rarely have a problem getting a taxi in the rain since they call ahead and have first preference over people in the street, according to Bernard Hager, a taxi owner and driver and Utog's president.

Individuals whose employers have charge accounts with Utog have only to give their account numbers to the driver when they enter a cab. The driver turns in a "chit," or voucher, for each credit fare at the end of the day.

With the thousands of charge customers generating vouchers, paperwork became overwhelming for Utog. "Last year, we billed over a half million dollars and this year we expect billing to exceed $1 million," Hager said. "That's why we needed a computer."

Keyboard Operation

Hager was sold on IBM's 5110 minicomputer on first try and purchased the unit in May. "The computer is small and inexpensive enough to make it practical for a group as small as we are," Hager said.

Month-end closing, formerly done manually, is now a matter of keyboard operation with the 5110, according to Leon Koltun, Utog's head bookkeeper. "We take the chits and key them into the 5110," he explained. "The computer matches up customer numbers with data in our disk files and prepares bills for mailing.

"At the same time, it accumulates the drivers' pay, including tips, and produces a check for each driver for all charge accounts he has driven in the past month," he continued.

Before the computer was installed, it took a week to process pay checks, according to Hager, while now it takes two or three days.

Ease of use was an absolute requirement for the computer system. "We are a cab company before anything else, and several people can run this system interchangeably," Koltun stated.

The system, which uses one program with a number of accounting functions within it, was usable right after a few application modifications, Koltun said.

Utog's 5110 has 32K of memory, a 120 line/min printer and five diskettes, each with 1M-bit capacities.

Syclone Offers Redundancy

(Continued from Page 53)

man explained. "This brings the redundant processor on-line, and all peripheral devices are placed under its control."

The on-line data processing applications can then continue while a CA field service representative is dispatched to correct the problem. Once the primary processor has been repaired, the switching station is again activated, and control is returned to the primary processor.

In addition to the dual processors and the switching station, the Syclone system can be equipped with up to eight disk drives, 32 CRT terminals, four spooled line printers, 32 character printers and two concurrent synchronous communications channels.

The eight disk drives can accommodate any mixture of 32M-, 80M- or 300M-byte drives for maximum on-line storage of 2.4G bytes, according to the firm.

The redundant processor must be configured with any special features such as expanded memory or other options that are present in the primary processor, according to CA. This ensures that the redundant processor remains a "clone" of the primary processor.

The basic Syclone system includes 64K bytes of memory in each processor, optionally expandable to 304K bytes.

The Syclone system represents a further step in the company's recently introduced Virtual Network concept, the spokesman said. One of the Virtual Network's key features is that any component failure will not affect other systems or terminals in the network.

In addition, each Syfa in the Virtual Network has two concurrent synchronous communications links which prevent it from becoming an "isolated node" if one of the links is lost, the spokesman said.

Virtual Storage

The Syclone system operates under the standard version of the Syfa Concurrent Logic Operating System (Syclops). This virtual storage operating system supports the concurrent execution of 32 interactive foreground applications programs, 16 batch background jobs, four printer spooling jobs and two synchronous communications tasks, the spokesman said.

The dual processors are housed in the desk-type enclosure with the disk drives while the switching station is free standing.

The primary processor sells for $29,000. Disk drives and other peripheral units are offered at standard Syfa list prices. The redundant processor and the switching station together cost $32,500 for a system with one disk drive.

For each additional disk drive configured on the system, the price of the redundant package increases by $3,000, the CA spokesman said from 2181 Dupont Drive, Irvine, Calif. 92713.

Basic Four Adds Novices' System

(Continued from Page 53)

Data is transmitted over full-duplex asynchronous communications lines at a maximum rate of 9,600 bit/sec, according to the spokesman.

For a distributed processing environment, the System 410 is available with Basic Four's Forms Entry System as well as a synchronous communications capability.

The standard bidirectional printer can produce forms and reports and plot graphs, the spokesman noted. The basic printer for the system operates at 120 char./sec, but the system can support two 600 line/min printers.

Ten Serial Ports

Also optional is a terminal controller that enables the user to expand the system with up to 10 serial ports. Peripheral equipment such as remote printers and up to eight CRT terminals can be connected to the added ports.

Applications software that is available for other Basic Four systems can be utilized on the System 410, the spokesman said.

The System 410 represents an extension of the hardware philosophy of Basic Four's System 200, which was introduced last January, according to the spokesman. Both systems used a fixed disk with tape cartridge backup as opposed to Basic Four's usual Trident removable disk, he explained.

The minimum configuration carries a $32,500 price tag. Basic Four can be reached at P.O. Box C-11921, Santa Ana, Calif. 92711.

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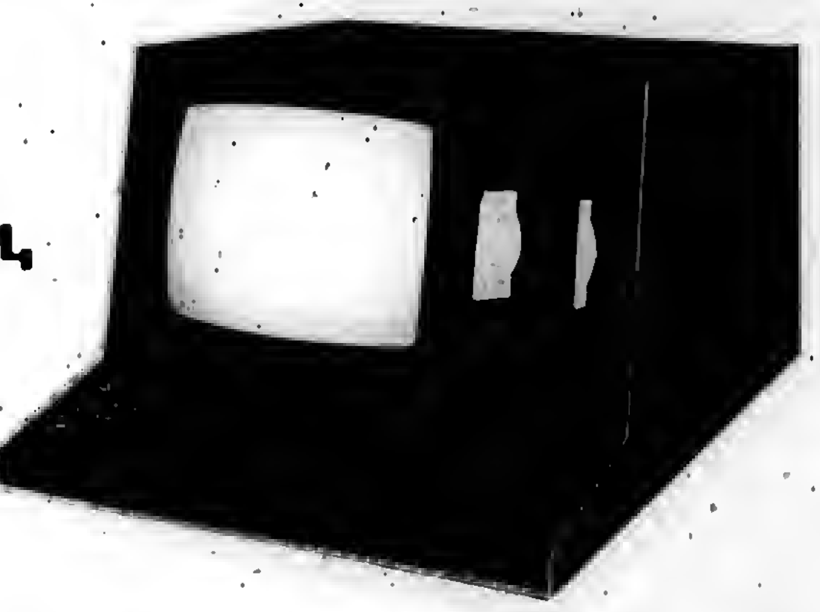

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More Capacity Needed

Change in Vendor Loyalty Increases Efficiency

ZION, Ill. — After seven years of upgrading from one IBM system to another, a wholesale distributor here switched to Wang Laboratories, Inc. equipment in a move that resulted in more efficient operations and greater system expandability, according to the firm's DP manager.

Mid-Way Supply, Inc., a distributor of refrigeration and heating supply parts, has long used computer technology to maintain the basic tenet of its operation — speedy customer service. Founded 26 years ago, the company first used computers in 1964 through a service bureau. In 1971, an IBM System/3 Model 6 was brought in-house.

Later expansion resulted in a move to a System/3 Model 8, but eventually an increase in work volume, inventory and a desire for new applications created a need for more capacity.

Solution Not Optimum

The logical response to the situation was yet another upgrade, according to Kay Sisson, DP manager for the firm. In mid-1977, Mid-Way ordered an IBM System/34 to meet its expanding needs.

"That really wasn't an optimum solution," Sisson said, "because at that time the disk space offered on the System/34 was only 2M bytes short of being filled with our current information."

Sisson, daughter of the company's founder, also acts as treasurer, office manager and personnel manager for the company. "With all my other responsibilities, I really couldn't afford the time required to go through the time-consuming task of converting from one IBM system to another again and again," she noted.

After receiving literature in the mail describing a virtual storage computer being released by Wang Labs, Sisson visited Wang's Chicago office for a hands-on demonstration.

Mid-Way had about 200 programs to convert, most of which were written in RPG-II. The firm also wanted to do some programming in Basic in relation to its purchasing functions.

Since the Wang demonstration indicated both RPG and Basic could access the same files, Sisson decided to pursue the matter further and took a tour of a large merchandising user's installation. The visit made up Sisson's mind. In February the sale was made; the Wang VS system arrived in May and was operational a day and a half later, with conversion taking place in July.

Mid-Way's system is comprised of a Wang VS system with three workstations and a system console, a 128K-byte memory, a 200 line/min 2261-V printer, 75M-byte disk drive and a 9-track tape drive.

Speedy Conversion

In order to facilitate a speedy conversion, Sisson said, most programs were converted from the IBM system batch processing to batch processing on the Wang system. To better utilize the Wang unit's on-line storage and retrieval system and to allow Mid-Way to accelerate inventory records, an on-line order entry system is being developed on the VS system for use in the near future.

A total of 300 to 400 orders per day are processed from Mid-Way's four locations. "Utilizing the current batch invoicing system, each day we update a month-to-date quantity sold, keeping track of dollars in sales and dollars in cost for each product at each location," Sisson said.

Once a month that information is incorporated into a history record containing the last 18 months' data as well as three years of totals. In this way the purchasing agent can logically determine what to order.

"With 8,000 or so line items coupled with about 1,200 suppliers and almost a million dollars tied up in inventory, the history reports are very important to us," Sisson noted.

"They depict at a glance what products have been sold at what locations and during what months, so we have a trend analysis by product number and location."

Accounts payable procedures include invoice transactions, check printing, maintenance of a check register and a number of reporting tools to keep up with the daily rate of 15 purchase orders, some containing up to 400 line items.

The conversion of IBM programs to the Wang VS was an easy task, according to Sisson. "I made modifications and compiled almost 100 programs in four hours one day on the Wang system," she noted. "Programs were being changed and compiled in less than three minutes."

Modifying programming instructions was also a minimal effort because of the VS IBM compatibility and its text editor: "I didn't have a great deal more difficulty on program code conversion between the System/3 and the VS system than I had in going from the IBM System/3 Model 6 to Model 8.

"Leaving IBM was not an easy thing for us, but I don't regret our decision," she added. "I love the fact that we can grow with the Wang VS system without making any conversions."

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Neil D. Frazer, Principal Engineer, INFOREX

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System Helps Firm Direct Thriving Inventory

SAN ANTONIO, Texas — Moving from a batch processing system to an interactive one has given an equipment and parts distributor here not only better customer service capability but also accurate inventory status reporting.

Catto & Putty, Inc., founded in 1939, sells air-cooled engines manufactured by Briggs & Stratton, Tecumseh and Kohler as well as lawnmowers manufactured by Murray, Snapper and MTD Products, Inc. It also sells all parts and accessories for these product lines.

Its volume requires more than 12,000 inventory categories which contain many thousands of individual items, according to Bill Putty, the firm's president.

"In the early 1960s, the enormous volume of paperwork generated by our high turnover of inventory was becoming too much to handle," Putty explained.

"We first tried our hand at DP in 1962 with an IBM 402, then in 1966, we went to an IBM 407 and in 1969, to an IBM System/3," Putty noted, adding that each change taught his firm more about DP and what it could do for business.

Catto & Putty's computing, however, was in batch mode, involved two employees as full-time keypunch operators and just wasn't fulfilling the requirements of the company. "It was too slow and our inventory records were never up-to-date," Putty said.

"We have always tried to operate our business on a 'real-time' basis, serving our customers as expeditiously as possible," he noted. The wait for computer time motivated his interest in dispersed processing.

Demonstration Arranged

In the spring of 1975, Putty arranged for a demonstration of some Datapoint Corp. equipment. "We put Datapoint 3600 CRT workstations exactly where we needed them — in customer service, warehousing, receiving and invoicing.

"After a few days, I didn't need to have 'functionally dispersed DP' explained to me," he noted. "I could put computer power where it was needed." Following further demonstrations, the firm leased the equipment it needed in the summer of 1975. Catto & Putty has since mastered transaction processing by bringing computing capability to all sectors of the company, according to the firm's president.

Out of 15 in-house employees, nine use the Datapoint Datashare system on a part-time basis for processing their paperwork transactions, and six others work with the system on a full-time basis. These personnel are involved in all aspects of the business, and manually generated paperwork is practically nonexistent, Putty said. New employees are trained on the system as part of their orientation so they understand everything as a package. As a rule, they are on-line within a month.

Benefits of System

"Now all of us have full access to all our business information all the time," Putty remarked: "We are able to input error-free data because the system checks for accuracy as the data is entered from source documents.

"This reduces massaging of information, virtually eliminates errors, lowers cost and, as a result, we receive timely information we can believe in, both on CRT screens and hard-copy orintouts," Putty said.

Catto & Putty's Datashare business time-sharing system consists of eight Datapoint 3600 CRT workstations that transmit and receive data interactively to and from a Datapoint 5500 business computer.

The 5500, with 48K bytes of user memory, utllizes two mass storage disk units with a total of 50M bytes. The system includes one Datapoint 60 line/min terminal printer and one Datapoint 300 line/min printer.

Perpetual Inventory

As soon as a shipment is received at Catto & Putty, it is entered into the inventory system through a 3600 workstation in the receiving department. The system tracks quantities of inventory items on hand and monitors back-order levels.

A "picking slip" is automatically produced from the customer back-order file on an "oldest order, first out" basis, Putty explained. Those items are "picked" before the order is stocked, assuring back-order priority and ensuring that these units are not entered as active inventory.

Reorder points are established for each item and when they are reached, the system indicates this on a suggested order printout. In addition, the history of each item's usage — its dated turnover — is noted by the program so purchases can be made to coincide with periods of peak demand.

Fast Information

Fast information for customer service is one of the main benefits of the system. According to Jessie Guerra, the man behind the customer service counter, "When I key in the inventory status report, I receive the item description, stock number, manufacturer, pricing structure, numbers on hand, on order and on back order as well as item warehouse location by aisle and bin number."

Besides its own business computing, Catto & Putty also provides computer services for six organizations ranging from a jazz band to a church. To meet all these needs, the system uses a large number of programs.

These include 16 accounts receivable programs serving 700 accounts, 12 payroll files using 20 programs that issue checks to more than 100 people twice a month, in addition to 75 inventory programs.

The company's DP library also includes 25 general DP programs, 21 receiving and accounts payable programs and 34 sales analysis programs, according to Putty.

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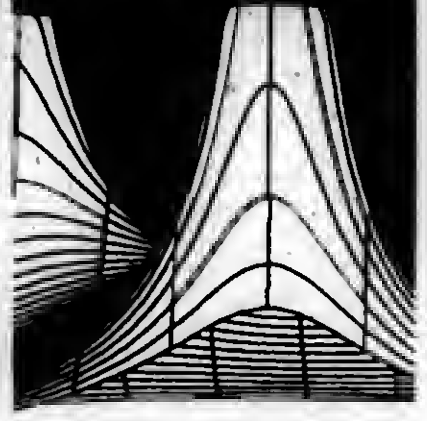

HP 2631 Line Gains Graphics Unit

PALO ALTO, Calif. — A graphics model has been added to the recently introduced Hewlett-Packard Co. dot-matrix, serial impact 2631 series of printers. The printer produces hard copy on standard paper from any raster-format display on an HP 2647 or 2648 CRT graphics terminal, according to the firm.

The HP 2631G, with resolution of 72 by 72 dot/in., is also an alphanumeric printer that accepts Ascii data and prints at 180 char./sec, like all members of the HP 2631 family, a company spokesman said.

Graphics print speed is increased with a double-buffering technique, by which the 2631G can accept graphics data while simultaneously printing, the spokesman claimed. Graphics throughput is further enhanced by using the microprocessor to delete trailing blank portions of the display.

Using this technique, a typical graph of 10 in. by 5 in. from the screen of a CRT terminal can be printed in less than 60 seconds. The hard copy is nonfading and multiple-part paper may be used, according to HP.

The HP 2631G shares the alphanumeric capabilities of the HP 2631A, upon which it is based. Its microprocessor computes the shortest printing path, deletes all leading and trailing blanks, and skips over 10 or more imbedded blanks, the spokesman explained. Horizontal tabs are similarly speeded, he noted.

Forms of up to six parts with carbon interleaved may be printed with widths up to 15.75 in. and of any length up to 255 lines. Page length (physical page size) and text length (printed page size) can be independently set via program control, the spokesman said.

Four print sizes are program selectable — 5 char./in. and 7.2 char./in. for titles and headings and 10 char./in. for normal typewriter-size text, the spokesman said. Compressed printing at 14.4 char./in. allows 196 columns on standard computer paper.

Line spacing is also program-selectable at one, two, three, four, six, eight and 12 line/in. for superscripts, subscripts and single or double spacings in six or eight line/in. The standard unit comes with the full 128 Ascii character set, including upper and lower case characters as well as all control codes, according to the firm. Using display function mode, control codes are printed for debugging of formatted data output.

Several optional foreign languages are available including the European languages, math symbols (Greek), Cyrillic and Katakana, the spokesman said. Several of these languages may be resident in the 2631G and are selectable via program control. A high-density language is also available which operates at 90 char./sec for applications requiring letter-quality print, according to the company.

The printer is said to be adaptable for business, science and engineering applications.

The HP 2631G costs $4,250 with quantity discounts available. The unit comes with an HP-IB (IEEE 488-1975) interface and operates with HP's 2647A and 2648A graphics CRTs.

Delivery is about 12 weeks from 1507 Page Mill Road, Palo Alto, Calif. 94304.

LSI-11 Users Get System Analyzer

PORTLAND, Ore. — A hardware and software instrumentation package for the Digital Equipment Corp. LSI-11 family of microcomputers that was designed for debugging, system resource usage measurement, software optimization and computer education is available from Nortek, Inc.

The system reportedly helps answer such questions as "What sequence of events preceded the processor halt?" "What is the ratio of I/O and processing activity?" and "How long does this software routine take to execute?"

Monitoring memory access and utilization is possible through an X-Y coordinate mapping technique, resulting in a real-time display on the user's oscilloscope. Software-controlled "windowing" refines the display by a factor of 8, a spokesman claimed.

Address, data and interrupt vector information may be collected by means of an interface compatible with most logic analyzers, according to the firm. Card edge connectors terminate all major signals and LEDs visually monitor principal control signals, he noted.

The module is priced at $500, which includes cables and connectors, a user manual and an extended version of the ODT software debugging program. Nortek is at 2432 N.W. Johnson St., Portland, Ore. 97210.

RAMs Reduced By Monolithic

ENGLEWOOD, Colo. — Monolithic Systems Corp. has reduced the prices of its 64K- and 32K-byte random access memory (RAM), Multibus-compatible memory systems.

The MSC 4602 with 64K of RAM is now priced at $1,925, reduced from $2,175. The 32K version costs $1,190, down from $1,275.

Both versions of the memory system offer up to 16K of on-board erasable programmable read-only memory (Eprom) at additional cost.

Prices are for single quantities; OEM discounts are available. Monolithic is at 14 Inverness Drive East, Englewood, Colo. 80112.

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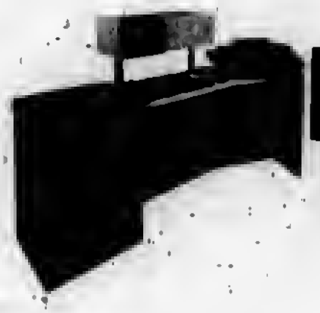

NCSS 3200

For Novas, Eclipses

Controller Allows Disk Mixing

SUNNYVALE, Calif. — Data General Corp. Eclipses and Novas can reportedly accommodate up to four storage module-, Winchester- and IBM 3330- type disk units with a disk controller from Ball Computer Products, Inc.

Capable of supporting up to 1.2G bytes, the Model 3255 controller occupies one CPU chassis slot and accepts disk units whose data transfer rates range from 806 byte/sec to 1.2M byte/sec., according to a Ball spokesman.

Mass storage modules supported by the 15 sq-in. board include the Ampex Corp. 940, 980, 9100, 9200 and 9300; Ball BD 50 and BD 80; Control Data Corp. 9730, 9760, 9762, 9764 and 9766; and Memorex Corp. 601 and 677.

The controller can intermix any of these products regardless of capacity, transfer rate or organization, the spokesman added.

Ball also credited the Model 3255 with combining control functions usually requiring multiple disk controllers. Some of these functions reportedly include error correction capability, multiple-record length format, bad-track flagging, alternate track sparing, automatic diagnostics, overlapped multiple seeks, multirecord transfers and a 2K-byte, first-in/first-out buffer.

Using proprietary technology, the controller can correct errors in bursts as long as 11 bits and detect burst errors as long as 25 bits, the spokesman said.

For systems with support facilities, the controller incorporates the logic for automatic drive power sequencing, logical unit file addressing and dual-channel accessing from two independent or dissimilar CPUs, the spokesman said.

The Model 3255 costs $3,500 and is available from Ball at 860 E. Arques Ave., Sunnyvale, Calif. 94086.

Okidata Printers Gain Capability For Graphics

MOUNT LAUREL, N.J. — In addition to printing conventional text, two members of the Okidata Corp. Slimline Series of line printers can reportedly output drawings, graphs, bar codes, charts, logos and half-tones now that the company has equipped the printers with a graphics capability.

Okidata added the graphics option only to the 125- and 250 line/min members of the Slimline series, which also includes 160- and 300 line/min models.

With the graphics capability, the two Slimline members can reproduce any image that a CRT terminal can display, according to an Okidata spokesman.

Available with Centronics Data Computer Corp. and Dataproducts Corp. interfaces, the graphics-equipped printers horizontally output 60 dot/in., equivalent to 792 dots across a 13.2-in. line, the spokesman said. They vertically output 72 dot/in.

Without the graphics option, the 125- and 250 line/min printers costs $1,895 and $2,495, respectively. With the graphics option, the two units cost an extra $95 and $150, respectively.

Okidata is located at 111 Gaither Drive, Mount Laurel, N.J. 08054.

Smart Disk Controller Built for Intel Micros

CINCINNATI — An intelligent controller that interfaces a number of rotating storage devices has been announced by Computer Systems Development, Inc. (CSD).

Based on the Intel 8085 microprocessor, the CTR-80/86 allows connection to Intel MPUs through the Intel Multibus, a CSD spokesman said.

The device can control up to eight fixed, floppy and/or cartridge disk drives and is physically and electronically compatible with Intel's SBC series of computers and interfaces, according to the spokesman.

The unit offers control of Winchester-type fixed disk or cartridge disk units and floppy disk units including single- or double-sided and single- or double-density devices. It also features FM or MFM encodability and media compatibility with IBM 3740 or Series/1 equipment, CSD claimed.

The CTR-80/86 is priced at $1,995. CSD is at 4154 Crossgate Drive, Cincinnati, Ohio 45236.

Prime Improves Drives, Maintains Original Prices

WELLESLEY HILLS, Mass. — Prime Computer, Inc. has enhanced a number of its storage module disk drives while maintaining previous prices and reducing previous maintenance costs, according to the firm.

These improved disk drives offer several features not found on earlier 40M-, 80M- and 300M-byte disk drives, including a pack access cover interlock, write protect switch and a dual-port option.

The pack access cover interlock switch prevents the disk drive lid from opening when the pack is spinning. The write protect switch, when depressed, inhibits writing on the disk pack, enabling the drive to be used in a "read only" capacity, the spokesman explained.

The optional dual-port hardware feature requires no software support, the spokesman said. It allows two systems to be physically cabled into one storage module device and have only one system actively accessng the disk.

The devices are compatible with the storage modules they replace, according to the firm.

Available immediately, a 300M-byte disk subsystem including controller, disk pack and cable costs $42,000, with an annual maintenance price of $300. An 80M-byte disk drive subsystem with controller, cable and disk pack costs $27,000 with an annual maintenance price of $200.

A 40M-byte disk subsystem with controller, disk pack and cable lists for $23,500 with an annual $200 maintenance fee. Prime is at 40 Walnut St., Wellesley Hills, Mass. 02181.

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Store Owner Cites Snags

Micros Seen Not Yet Ready for Business

By Tim Scannell
CW Staff

WALTHAM, Mass. — Data processing aficionados will probably remember 1978 as the year of more powerful processors and unbundled software, suitcase-sized minicomputers and 64K-bit chips. But few will commemorate this year as a time when microcomputers were finally accepted as legitimate small business systems, according to the president of a computer store here.

"Microcomputers have not truly entered the business field yet," Charles Dunning of Computer Mart, Inc. stated. Problems in hardware and software development as well as exorbitant prices are among the factors preventing "the true under-$10,000 micro business system" from happening this year.

Microcomputer software takes up the biggest chunk of a small business system's price becuse of the time and effort it takes to fully develop the package, which makes it "very, very tough" for the software producer, Dunning noted. "There are relatively few software producers in the microcomputer field who are selling programs in high enough volume to really amortize their development costs."

Buyers expect software costs to be a fixed percentage of the micro's hardware price, when actually it costs more to produce good business software on a microcomputer than on a big machine, Dunning added.

Support Problems

Reliable support, or the lack of it, is also a basic concern of the businessman considering a microcomputer-based inventory or payroll system. Dealers not only have to support hobbyists who may treat the computer like a "hi-fi" system or electronic game, but must also back up the businessman whose company may fall apart if the system is down too long, Dunning explained.

"Hardware and software have to be kept running and that's a lot more risk for us so the [total] price is going to have to be higher to take that into account," he said.

Small business-oriented microcomputer packages in the $3,000 to $4,000 range, such as Radio Shack's TRS-80, are a "farce," Dunning said. "Anyone who is serious about doing all five or six business functions on a computer, who wants maintenance and who wants the system running all the time will pay at least $15,000 for his system, if he's lucky."

The TRS-80 could be a business system "with about $1,000 to $3,000 worth of additional hardware and perhaps somewhere between $1,000 and $3,000 worth of additional software," Dunning commented.

"What [Computer Mart] considers to be a business system is a complete turnkey package it can present to the businessman and teach him how to run so that he can immediately do something with it by running at least part of his business paperwork," Dunning pointed out.

Next year, a large number of suppliers might configure slightly customized hardware and software for small business purposes, but providing the support and writing programs to handle all of the data functions will be a problem, he said.

The storage requirements necessary for a successful small business system are also beyond the capabilities of most microsystems, Dunning continued. "You can just get 5,000 items on a dual-floppy disk system and that's not practical because the person might go to 10,000 items and he'd be out of luck."

In the meantime, users who decide to purchase microcomputer business systems this year will have to settle for "pig in the poke" machines — packages that take so much effort to customize that they are overpriced and usually fall short of doing the job.

However, there are a few rays of hope in the horizon for the underdeveloped business micro system and reliable packages could trickle into the market as early as February or March, Dunning stated.

Community DP Resources Coming for Boulder Residents

By Ann Dooley
CW Staff

BOULDER, Colo. — The Boulder Community Center is working on several innovative techniques to bring more information and automated technical expertise to the community it serves.

For the last year, the center has been sponsoring DP education at its Community Free School, where children and adults have the opportunity to learn computer programming and application techniques. The Free School, which uses an Alpha Micro AM-100 system with 64K of random-access memory (RAM) to process its mailing lists, registration and other business activities, also uses the equipment to instruct community residents in computers.

Classes in computer programming are held for children in the afternoon after school and adults can attend classes in the evening. Currently 25 adults and 30 children under the age of 14 are learning programming techniques using the Basic language, according to Stephen K. Elliott, project coordinator. The Free School uses six terminals, a mixture of Digital Equipment Corp. Decwriters, IBM Selectrics and Lear Siegler, Inc. ADM-3. The system also uses four Persci, Inc. floppy drives, Elliott noted.

In order to take the computers out of the classroom and "into the streets," the Free School is planning to set up terminals throughout the city so that citizens can access the system for community information. Elliott plans to install terminals with built-in coin boxes and charge users 50 cents to use the system.

The system would include information of community interest such as items for sale, a calendar of events, personal messages, lost and found items or anything a user wants displayed, Elliott said. A user could call up an item of interest from a menu of different items. The user would only have to respond to prompting from the computer, which "takes the user where he wants to go." In

(Continued on Page 60)

Intel 8086 Development Aided

WALNUT CREEK, Calif. — Designed to support applications program development for the new Intel Corp. 8086 16-bit microprocessor, the Microbench 8086 fom Virtual Systems, Inc. is a family of software products that operate in conjunction with the Digital Equipment Corp. PDP-11 and LSI-11, the firm said.

Included in the Microbench 8086 software are a relocating assembler, linking loader, librarian and object file formatter. The assembler supports macro and conditional assembly capabilities and cross-reference listings and provides for memory addressing. The loader provides linkage facilities, selective loading from Libraries and directives for specifying read-only memory (ROM) and random-access memory (RAM) alignment boundaries.

The object file formatter produces binaries in compatible formats for use with most programmable read-only memory (Prom) programmers and emulation systems.

Perpetual license fees start at $1,695 including documentation and first year's maintenance from Virtual Systems, Inc., Suite 406, 1500 Newell Ave., Walnut Creek, Calif. 94596.

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TRS-80 Coding Provides Dumps, Helps With Typing

FULLERTON, Calif. – Faulk & Associates Software has introduced two programs for the Radio Shack TRS-80.

Hexdmp provides hexadecimal memory dumps with all printable characters printed to the right of each line. The program will run either alone or as the "U" command under the RSM-1 monitor program from Small Systems Software.

Touch helps the TRS-80 programmer learn touch typing. The program contains the basic instructions for finger position and teaches proper use of the fingers in striking the keys. A series of "pointer" drills in which the computer selects keys at random to be struck and which can be limited to either the left or right hand or cover the entire keyboard are part of the program.

Hexdmp costs $12.95 and Touch $7.95 plus 6% sales tax for California residents, from Faulk & Associates Software, 2531 E. Commonwealth Ave., Fullerton, Calif. 92631.

Zilog Adds Card Enclosure

CUPERTINO, Calif. – Zilog, Inc. is offering a table-top standard card enclosure (SCE-4) to make it easier and faster to use Zilog's family of microcomputer boards in the system, the firm said.

The SCE-4 comes with four slots for Zilog boards and in a single enclosure combines power supply, internal system cooling fan and external controls. The enclosure is designed for switchable operation from 110- to 220V.

The enclosure features a reset button synchronized to lhe reset of the single-board Z80 and an interrupt or break button to enter interrupt subroutines manually. The unit also features I/O connectors for serial and parallel I/O to the board and cutouts for additional I/O connectors that can be added.

Cost of the SCE-4 not including any boards is $795 for quantities up to 10 from Zilog, Inc. 10460 Bubb Road, Cupertino, Calif. 95014.

City Starts DP Projects

(Continued from Page 59)

this way, no technical expertise would be required, although there would be instructions for use with each terminal.

The terminals would be installed at shopping malls, libraries and other places where large groups of people would pass by, Elliott said.

Successful Test Run

The project has been in the planning stage for some time because the community group has had difficulty getting the concept funded sufficiently. But the community reponse would definitely be high, Elliott claimed, since the concept was tried on a limited basis with successful results. One terminal was placed in the Boulder Public Library for a short time and 400 people, including many who had never used a computer before in their lives, tried it out, he noted.

Once funds are available, 12 terminals will be placed in key spots around the city for use by residents. A decision has not been reached as to what kind of equipment will be used but the terminals would have to be able to stand frequent use and be adaptable to the coin boxes. When the project is fully implemented, Elliott wants to have 24 terminals positioned in Boulder, with 12 terminals accessible simultaneously.

The system would be self-limiting so that after 90 days all the messages would be cleared and new ones would be put in or old messages would have to be refiled. A dictionary would also be incorporated into the system so that it could be programmed to blot out obscene words.

If funding becomes available, Elliott plans to have the system up and running by next September.

Generator for Tests Bows

ANAHEIM, Calif. – A programmable function/pulse generator available on the IEEE 488 bus, with high-speed testing performance, is being offered by Interstate Electronics Corp.

The 20-MHz Model 860 accepts general-purpose interface bus commands up to 100 times faster than competitive instruments, the company claimed. The Model 860 also provides selection of waveforms, parameter controls and operating modes.

Every pulse parameter is programmable, including independent rise-fall times, pulse delay and width, crystal-referenced frequency and exact burst count. The unit is particularly suited to high-speed testing of digital/hybrid circuits or incoming inspection testing, the firm said.

The Model 860 also provides sine, square, triangle and ramp waveforms in addition to its pulse compatibilities.

The Model 860 costs $3,995 from Interstate Electronics Corp., 1001 E. Ball Road, P.O. Box 3117, Anaheim, Calif. 92803.

Ohio Scientific Adds Programs

AURORA, Ohio – Ohio Scientific is offering users an expanded software library, ranging from games to sophisticated applications programs, on cassette or diskette.

The programs, which are available from retailers, cover personal, business and educational subjects such as annuity calculations, calorie counting, bond evaluation, ratio analysis and basic math as well as games like Lunar Landing and Star Trek. The programs range in cost from $6 to $600.

Ohio Scientific is at 1333 Chillicothe Road, Aurora, Ohio 44202.

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TRS-80 Gets Interface Module

SAN DIEGO — JC Enterprises has introduced an input/output interface, designed to expand capability of the Radio Shack TRS-80 microcomputer by providing four channels of programmable ac power control with 600W per channel and limited to a total of 1,600W.

The Model A828/TRS-80 can be used to sense switch closures, photo sensors and 5V logic levels; drive LED displays; and operate motors, solenoids and alarms.

The A828/TRS-80 is complete with a self-contained 5V power supply, interface cable, I/O port connector cable, metal enclosure and sample programs. The assembly is tested and ready to use by connecting the interface ribbon cables, the firm said.

The 8-bit input port is addressed with INP (0) function of Level II Basic or with T-Bug and Level I Basic. The 8-bit latched output port is addressed with Out O, N command of Level II Basic or with T-Bug and Level I Basic.

The A828 includes a TRS-80 interface cable and I/O port connector cable and costs $165 from JC Enterprises, P.O. Box 23445, San Diego, Calif. 92123.

Canadians Issue Invitation

STREETSVILLE, Ont. — The Toronto Region Association of Computer Enthusiasts (Trace) is inviting interested people to one of its meetings.

With 100 full-time members, two-thirds of whom have their own micro systems, Trace's goal is to foster communication and resource sharing among those interested in hobby computers. The meetings include one or two talks on micro-related topics and usually a system demonstration.

The club also has a monthly newsletter and a library of micro information. Other activities include flea markets, exhibitions and a software library.

Additional information is available from Ross Cooling, Box 545, Streetsville, Ont. L5m 2Cl, Canada.

Floppy Bows

CAMBRIDGE, Mass. — An intelligent dual floppy disk mass storage system offering high-speed track selection has been introduced by ECD Corp.

The ECD Biflex floppy disk is a 4.5-in.-wide, 512K-byte memory buffer mass storage system.

Designed for use with ECD's 7x microcomputer or Smart Ascii programmable intelligent terminal, the unit incorporates an 8080-based intelligent controller with IBM-compatible formatting.

The floppy disk is based on the Persci, Inc, dual diskette and utilizes single-sided, single density disks. It costs $3,900 from ECD at 196 Broadway, Cambridge, Mass. 02139.

Tarbell Basic Now Available

CARSON, Calif. — Tarbell Electronics has made available Tarbell Basic on cassette or disk. It is reportedly capable of disk interaction including saving and loading programs, chaining programs and loading data.

In addition to standard Basic features, several others have been added, according to the company. These include assignment of I/O, long variable names, cassette string data save, procedures with local variables and alphanumeric line labels.

Assign and Drop statements allow the user to assign or deassign as many as 10 physical devices to separate logical I/O devices. The interpreter occupies 21K of random-access memory, the firm said.

Both cassette and disk versions for the CP/M operating system cost $36 each. Source listing is available as a printout or on disk for $25 from Tarbell Electronics, Suite B, 950 Dovlen Place, Carson, Calif. 90746.

Racet Offering Basic Programs

ORANGE, Calif. — Racet Computes has made available two Basic programs, Timser and Y-Ybar, for use with the Radio Shack TRS-80 microcomputer with 16K bytes or similar systems.

Timser is a time series analysis program that fits data to nine different first, second and third order curves. Projected data and confidence limits and graphical displays of curve fit and variance are included.

The program provides for correction factors and functions to test seasonal variations, inflation corrections or cyclical variations.

Y-Ybar is an optical system design program that implements Y-Ybar diagram techniques, allowing manipulation of ray heights at lens surfaces, the firm said.

Timser (RD11C) costs $14.95 and Y-Ybar (RA31C) is priced at $19.95 from Racet Computes, 702 Palmdale, Orange, Calif. 92665.

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Stock Specialist Says:

'Going Public' Feasible for Small Firms

By Marcia Blumenthal
CW Staff

LOS ANGELES — Small high-technology firms in need of an infusion of capital usually overlook the option of going public. But a public offering is really feasible, even for companies requiring as little as $1.5 million of capital, according to Daniel C. Montano, a specialist in underwriting public issues for high-technology firms.

Recent changes in the regulations of the Securities and Exchange Commission (SEC) and the Carter Administration's relaxation of the maximum capital gains tax rate will make it easier for small high-technology firms to float public issues, Montano, vice-president of corporate finance for C.L. McKinney & Co., Inc., noted here recently.

Most small firms are hesitant to go public. A case in point is Randal Data Systems, Inc., which recently raised more than $1.2 million through a public offering, Montano pointed out.

Randal F. Walti, that company's president, had been skeptical about going public, thinking there would be no market for his company's stock. "There was a period of time when no one was going public. The thought of a company our size being publicly traded was ludicrous," Walti recalled. In 1976, only three companies with issues of less than $3 million went public, Montano said.

About two years ago, Walti put together a business plan to raise capital. The venture capital route was disappointing. "Here we were with sales of $4 million and venture capital firms were looking at us as though we were just starting up. The best offer we got from venture capitalists was $500,000. The cost of that capital was about what we would have expected to pay for $1 million to $1.5 million," Walti noted.

Fortuitously, Montano got in touch with Walti last December and suggested a public issue might be right for the company. Walti, interested but skeptical, agreed to talk to Montano.

Montano learned about Randal while reading a product announcement in the trade press. In fact, a thorough reading of trade journals for the computer and electronics industry is one way Montano learns about companies that may be suitable candidates for public offerings.

Instrumental in taking Microdata Corp. public in 1971, Montano has handled 41 public offerings in the past 11 years, with high-technology firms accounting for about 50% of those offerings.

In the middle of February, C.L. McKinney and Randal signed a letter of intent to make a public offering. Montano then assisted Walti in acquiring legal counsel and finding accountants to audit the firm according to SEC standards.

Because the Randal issue was small, an underwriting syndicate was not required. However, C.L. McKinney did offer 10,000 of the 300,000 shares in the issue to seven other brokers to sell.

The issue went on sale Aug. 21 and sold out in one hour and 45 minutes. "It wasn't my record for a sellout, but it was close,"

(Continued on Page 70)

U.S. Export Licensing Process Too 'Diffused,' GAO Reports

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The government's administration of export licensing is characterized by "diffused authority and a consequent lack of accountability to the public," according to the General Accounting Office (GAO).

A recent GAO report recommending a consolidated export licensing process noted it is "particularly ironic" that many exporters are awarded licenses but lose customers because the delays involved in the approval process cause them to fail to meet commitments.

The irony is compounded by the fact that the great majority of applications for export licenses are approved. Unfortunately for the DP industry, many of those applications turned down are for computers or related electronics products, according to GAO figures.

The GAO reviewed the government's export licensing procedures at the request of Rep. Jonathan B. Bingham (D-N.Y.), chairman of the House Subcommittee on International Economic Policy and Trade, and Rep. Don Edwards (D-Calif.), whose congressional district is the home for many electronics manufacturers.

The GAO investigation found that the management and authority for the licensing process are spread across so many agencies and offices that a lack of accountability and a failure to be responsive to U.S. industry results.

In theory, the Department of Commerce, through its Office of Export Administration (OEA), is supposed to control all exports from the U.S., except munitions and related technical data, which are licensed by the State Department, and nuclear materials and production facilities, which are licensed by the Nuclear Regulatory Commission.

The GAO found that in practice there exists an "export licensing community" consisting of Commerce and a group of consulting agencies, such as the departments of De-

(Continued on Page 70)

UK Promoting Use of Micros

LONDON — To assure that the UK keeps abreast of microprocessor technology, the government has launched a three-year program designed to inform industrialists about the advantages of using microprocessors in their products.

The government hopes to attract 50,000 participants to a series of seminars on the topic, each lasting about a day.

Eric Varley, Industry Secretary, said the government is appointing consultants to work with the National Computing Centre to plan the seminars. They will be part of the first stage of the Microprocessor Applications Project, which was announced last summer.

If the UK does not keep abreast of microprocessor technology, "We shall quickly be left behind, with grave consequences for employment, our standard of living and the quality of our social services," Varley said.

Last July the government announced the two-part plan: The first phase, estimated to cost about $7.5 million, consists of the seminars and consultant assistance. By the end of October, a list of 187 authorized consultants had been drawn up and the Department of Industry was considering paying a portion of the fees consultants would charge companies to assess the feasibility of applying microprocessors in their products.

The second part of the program calls for the investment of about $35 million to aid research and development projects for firms in the microprocessor industry.

The Department of Industry has received applications for support of 94 projects, the total value of which is about $7 million. Of these, 17 have been approved at a cost to the government of about $600,000, and 57 projects are still under discussion, Varley said.

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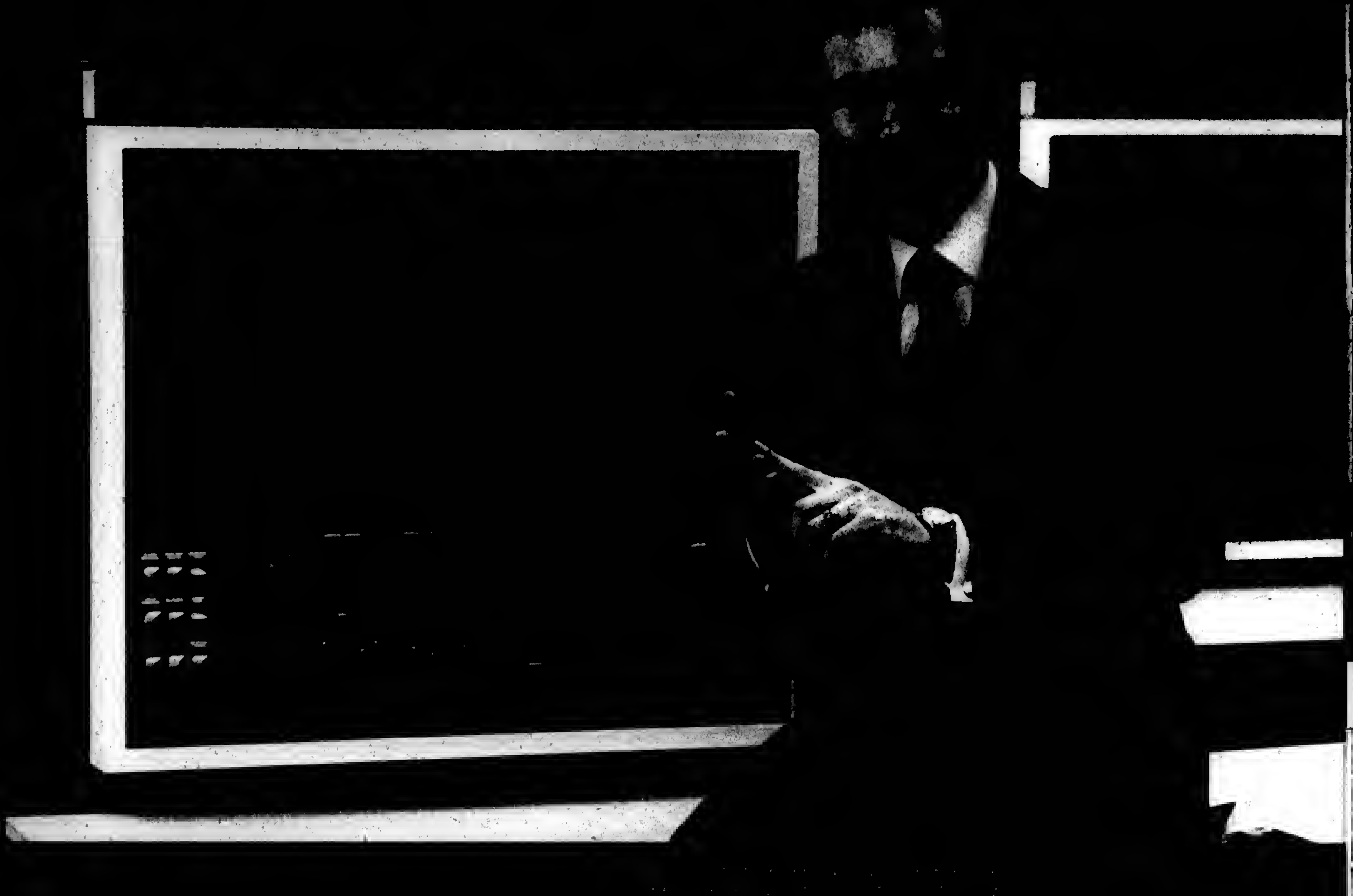

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Randal Sees Distribution Major Growth Factor

By Marcia Blumenthal
CW Staff

TORRANCE, Calif. — "We probably won't reach $55 million in sales until 1982," Randal F. Walti, president of Randal Data Systems, Inc., said here recently, adding that his company had planned to achieve that goal in 1981.

But Walti wasn't complaining, considering the company's 1978 revenues just topped $4 million.

Even with competitors such as Data General Corp. and Digital Equipment Corp., Walti thinks Randal, a manufacturer and marketer of small business systems, will be able to meet its objective because of the way the company distributes its products.

Its major products are small business systems — the Randal Systems 100, 200 and 500 — which cost the end user between $30,000 and $70,000. Randal also sells software packages, usually developed by its distributors.

Products aside, "We are in the business of putting distributors in the field," Walti said simply. The company currently has 80 distributors and expects to have 500 by 1981, adding distributors at the rate of four to six per month, Walti claimed.

This distribution method was what attracted Daniel C. Montano, vice-president of corporate finance for C.L. McKinney & Co., Inc., who was instrumental in persuading Walti to take his company public.

The public offering of 300,000 shares of common stock at $4 per share, underwritten by C.L. McKinney, was made Aug. 21 and was sold out in 1-1/2 hours. (See related story on Page 63).

To finance the company's four-year growth plan, which calls for more than doubling revenues annually, Walti expects the company will have to float more public issues.

Another boost to revenue that Walti is currently investigating is acquiring a company in the yearly revenue range of $3 million to $8 million.

Major Funding Source

The major source of funding, however, is Randal's distributors. "Every time we add a new distributor we get $25,000 to $100,000 added to our capital structure; adding four distributors a month provides monthly working capital of $100,000 to $400,000," Walti figured.

Part of that capital is derived from sales of demonstrator models to distributors. Distributors signing on with Randal must buy a demonstrator to keep in their offices. Randal helps with the software and assists the distributor with selling aids.

Moreover, distributors are required to take a training class which costs $4,750. Distributors are not given exclusive territories; in fact, Walti envisions as many as 20 distributors in Los Angeles.

Walti considers the distributors' investment in a demonstrator and the training course a commitment to sell Randal products.

Low-End Systems

The products are aimed at the low end of the small business system spectrum, costing the end user (often a first-time user) between $30,000 and $70,000. "I cannot foresee offering a system for more than $100,000," Walti said.

The emphasis on the low end of the small business system market is the reason Randal is concentrating on developing the Microlink product line, which is smaller than Randal's System 100, Walti said. About $100,000 of the funds gained from the public offering is being added to research and development expenditures for Microlink, which is in its final development stage.

Although competition in the marketplace, particularly from the likes of DEC and DG, is keen and was one of the risk factors mentioned in the prospectus for the stock offering, Walti appears unperturbed.

"DEC and DG won't completely commit themselves to the OEM," Walti asserted, pointing out that those companies' salesmen will take an order directly. "Every dollar we spend is in support of our distributors," he maintained.

Even with DEC predicting a downturn next year, Walti remains confident that his company can still reach that $55 million sales goal by 1982.

"DEC should be cautious," he countered. "It has to grow $300 million to $400 million a year to maintain its previous growth rate. The effect the economy has on DEC is considerably different than on us. We don't have our complete distribution network in place yet; we barely have tapped the international marketplace."

International Market

The international marketplace is a primary target for Randal, Walti pointed out. The company has already signed three foreign distributors, including Holland's Cimi, and is on the verge of signing a large Australian distributing firm.

Foreign distributors are attractive because they usually are large, established firms, Walti explaiend.

Aside from its small business systems, Randal has a subsidiary, Dataforce, which provides maintenance for Randal's distributors and for other manufacturers. That sector of the business is growing as fast as, if not faster than, the small business systems sector, Walti noted. In fact, a regional service company is a likely business for Randal to acquire.

Other types of companies being sought for acquisition deal with OEM supplies, word processing systems and sophisticated copying systems.

"We are concentrating our efforts on what's happening in that small business marketplace and trying to find out what the user needs," he said.

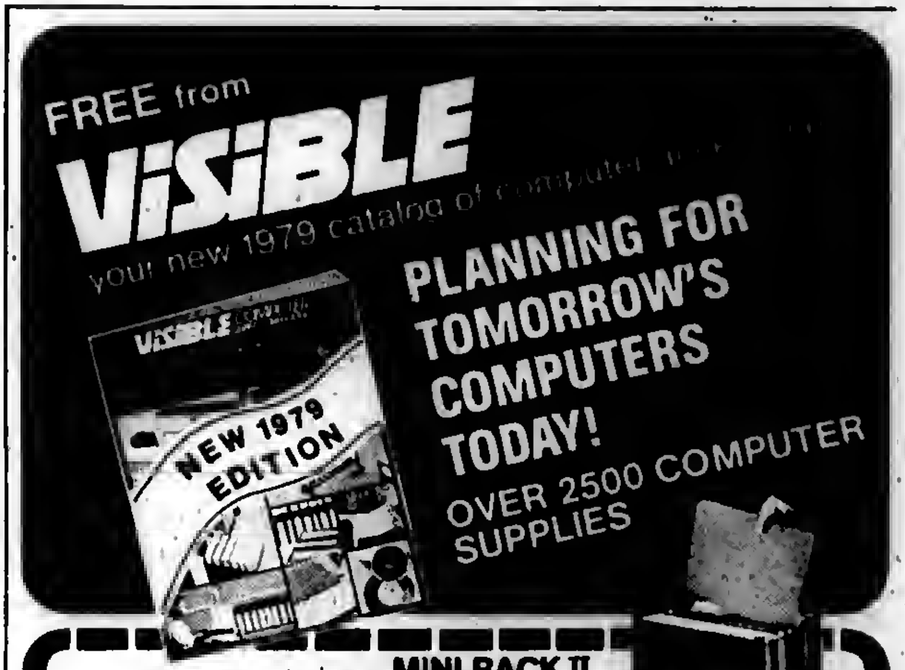
"If there had been a Randal Data Systems in 1972, I would have probably still been a distributor," Walti said. But at the time, he was a manufacturer's rep. "That was not the kind of marketplace I wanted. It was low margin and hardware-oriented and didn't solve problems for people. "I wanted to solve problems."

Supershorts

Wang Laboratories, Inc. has received an industrial tax exemption in Puerto Rico and plans to start limited manufacturing operations there this month. In addition, the firm voted a quarterly dividend of 1.5 cents per common share and 4 cents per Class B common share, payable on Jan. 30 to shareholders of record Dec. 11.

— — —

Xerox Corp. delivered its first three 9700 electronic printers, said to simultaneously print computer-generated text and create business forms, to New York Life Insurance Co.; Sears, Roebuck & Co.; and Comvestrix Corp., a New York service bureau.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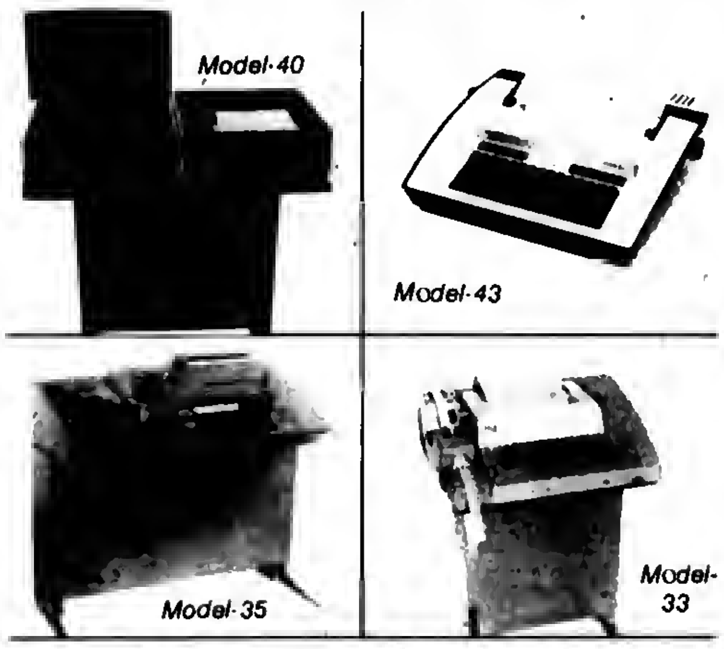

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Can Be Frustrating Ordeal

Case Shows Export License Snags

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Obtaining a government license to export sophisticated equipment or technology can be a lengthy and serpentine process.

A major cause of this problem, according to a recent General Accounting Office (GAO) report, is lack of centralized management and accountability for the approval process (see story on Page 63). The Department of Commerce Office of Export Administration (OEA), which is supposedly responsible for such license approvals, is a quagmire of diffused responsibilities, the GAO found.

A recent case history of an application to export semiconductor manufacturing equipment is illustrative of the frustrating and often costly experience a vendor faces in applying for an export license through the OEA:

August 1977: The applicant applied for a license to export the equipment to an Asian country. Its letter of credit was due to expire in mid-October and the equipment was scheduled to be shipped in mid-September.

September 1977: The application was received in OEA. The value of the equipment was about $8,100. A licensing division reviewed the application for about 12 days, then it was referred to the Policy Planning Division. That office referred the application to the Energy Department after five days, or one day after the scheduled shipping date.

October 1977: Since the application had not been approved by the scheduled shipping date, the applicant's letter of credit had to be extended and a new shipping date for mid-December was arranged after consulting with the consignee.

The applicant called an OEA licensing officer twice in the last two weeks of October to determine the status of the case; each time, the licensing officer replied he had no information on the status of the application. At the end of October, and after 42 days of review, Energy recommended approval.

November 1977: Four days after Energy recommended approval, the applicant again called the licensing officer, who said he still had no information on the status of the application. The applicant asked an official in a Commerce regional office to inquire about the application; he did, but also to no avail.

The applicant during this period mistakenly believed the Defense Department was holding up the application, whereas the application had not been referred to Defense. In mid-November, OEA sent the application to the Subgroup on Nuclear Export Coordination, which recommended approval without controversy. Six days later, OEA's Policy Planning Division recommended approval, and the application was approved eight days later, at the end of November.

On the day after Policy Planning recommended approval, the applicant cabled the consignee, asking him to send more information about the intended use of the equipment, stating that this information might help the government make a favorable decision.

December 1977: On Dec. 1, the applicant again asked the licensing officer for information about the application, but the officer again said he had nothing to report. Five days later, the applicant received the license.

DEC Set to Pay Some Who Took Maternity Leave

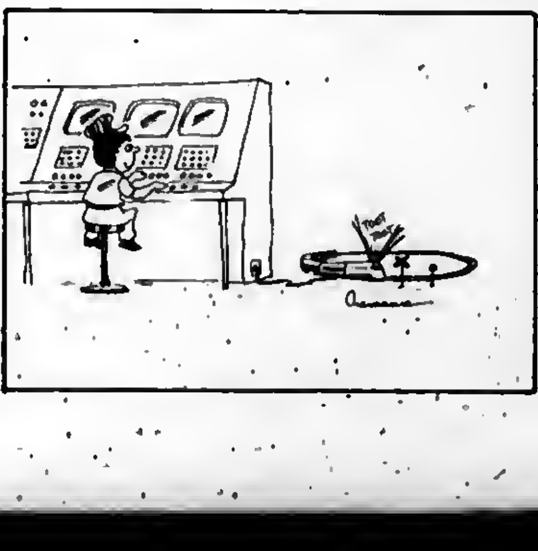
MAYNARD, Mass. — Digital Equipment Corp. has agreed to pay about $400,000 nationally in retroactive disability benefits to women who took leaves from work because of pregnancy.

Last May, the Massachusetts Supreme Judicial Court required that all companies that have disability plans pay women employees for pregnancy and childbirth leaves, just as they would for other illness covered under the disability plan. That ruling was an interpretation of the state's Sex Discrimination in Employment law, Assistant Attorney General Joan Entmacher said.

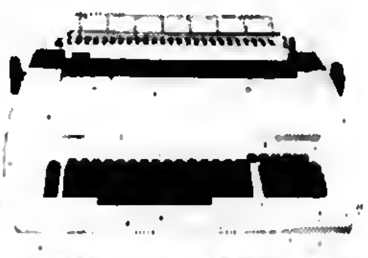
DEC's decision came after lengthy consultation with the state's attorney general, Francis X. Bellotti. Bellotti's office had not brought suit against DEC, a source noted.

More than $200,000 of the total retroactive benefits will be paid to Massachusetts employees. DEC, with 17,000 employees, is the fourth largest employer in the state and is expected to set the standard for the state's 278 employers who were investigated regarding the disability benefits, the attorney general's office said.

Entmacher said the agency could not reveal how many computer companies were involved in the investigation until the investigation has been completed.



Clearance Sale



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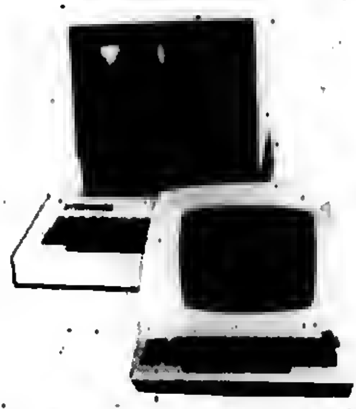

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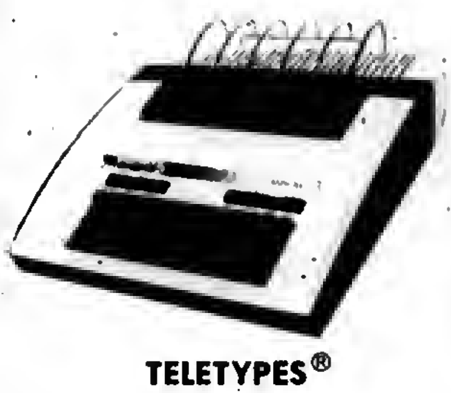

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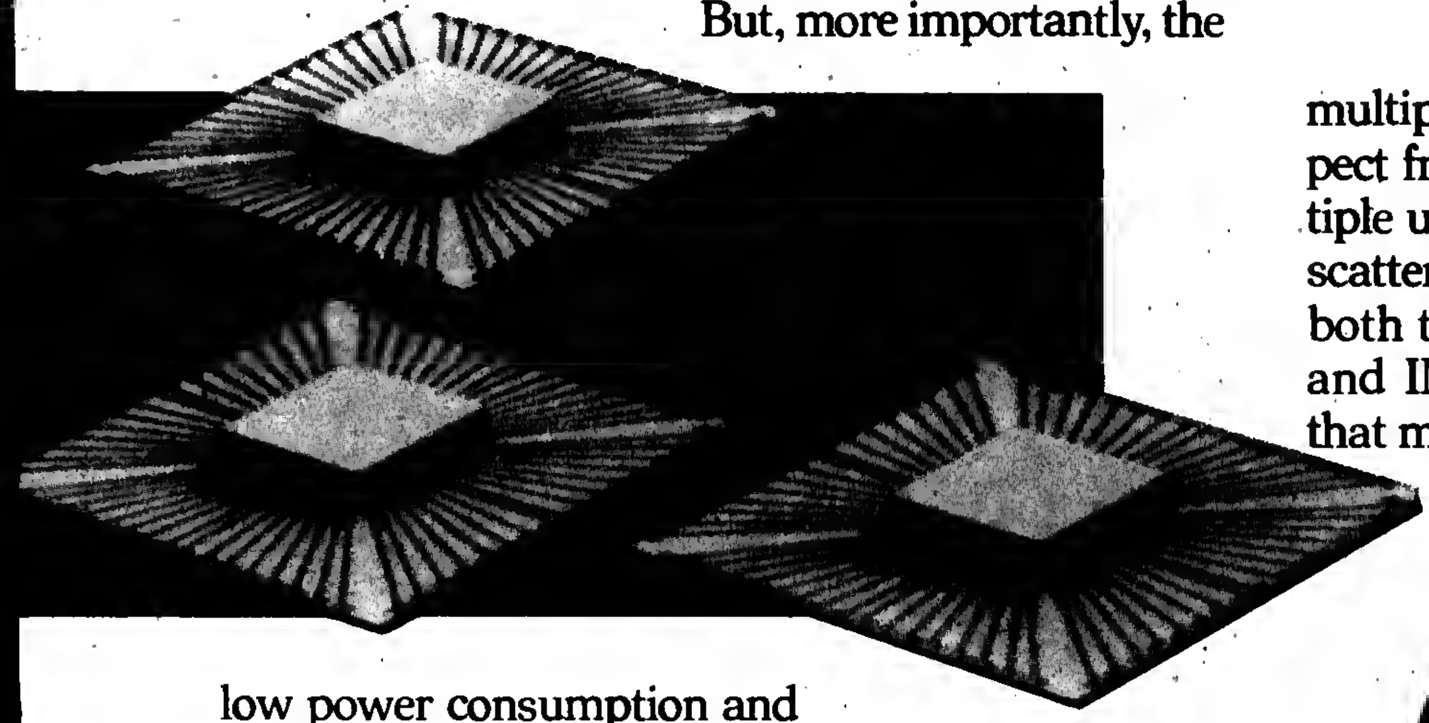

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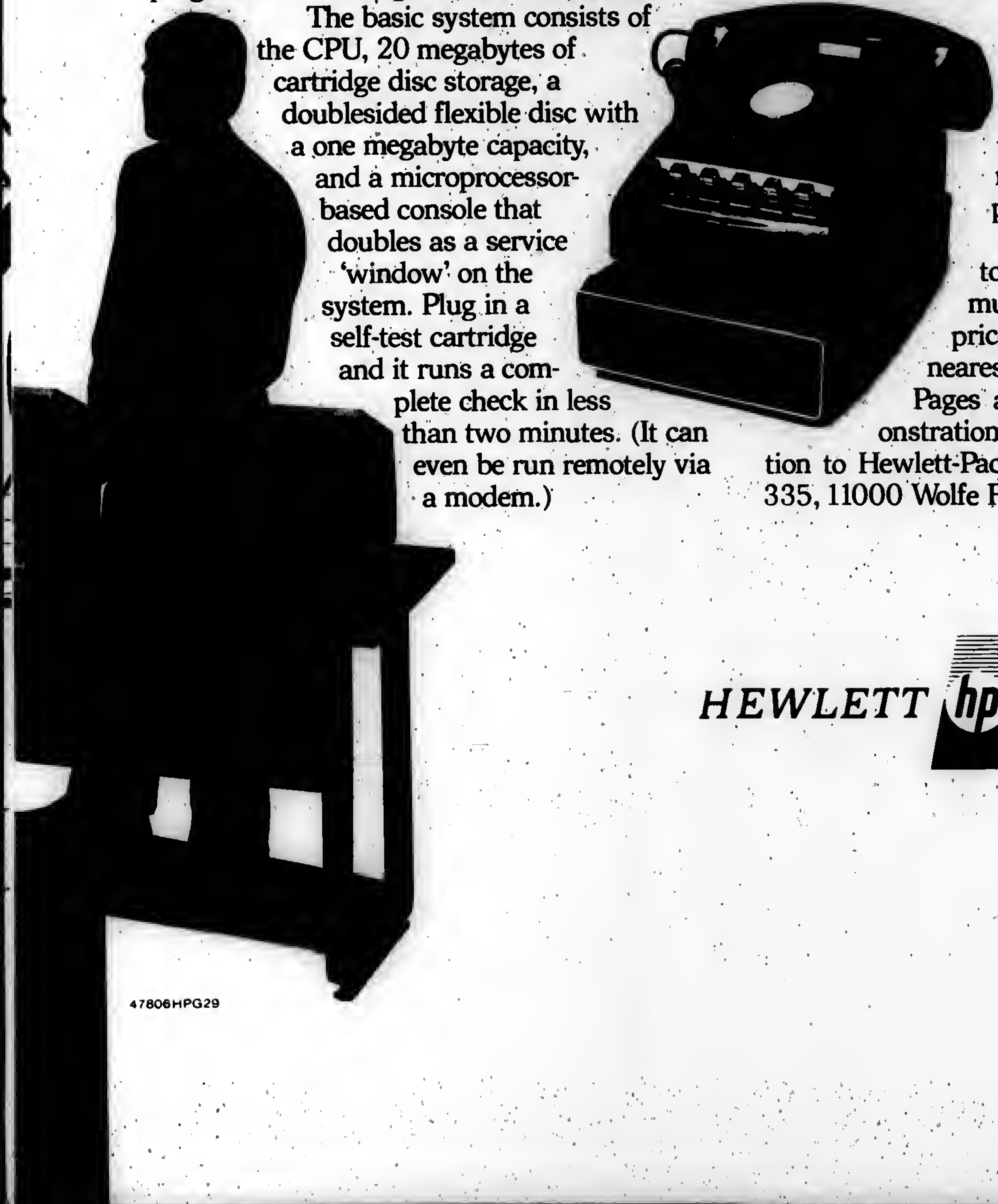

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Public Issues a Reality for Some Small Firms

(Continued from Page 63)

Montano said.

In determining a firm's ability to attract a market for its stock, Montano's major task is assessing whether he can trust the owners or managers of the companies under consideration. "That's 89% of my work," Montano explained.

In his opinion, there are two categories of high-technology firms. The first group have obtained venture capital and are inundated with professional advice. Every idea the company comes up with is going to be debated by all the owners, he said.

The other type of firm has one founder who owns a substantial portion of the firm even after the public offering. Because of this strong ownership position, the owner, usually the driving force behind the organization, cannot be easily voted down. Randal fell into this latter category. Walti still owns about 54% of his company.

Easier to Go Public

Recently, several regulations and laws have been passed to make it easier for a small firm to go public or attract investors. For instance, the SEC changed its Regulation A exemption, Montano noted. The revised exemption makes it less expensive for firms wanting to raise up to $1.5 million to float a public issue.

Until now, a firm's expenses for attorneys, auditors and financial printers could amount to between $40,000 and $145,000, Montano explained. With the new exemption, those costs can be reduced by one-third to one-half. Randal's issue cost $63,000 to mount and with the new exemption probably would have cost around $35,000, Montano said.

Another boon to small stock offerings is the Revenue Act of 1978, which, among other provisions, allows the issuance of $1 million — up from $100,000 — of Section 1244 stock. This stock privilege is granted to small businesses and allows investors in those businesses to write off any losses incurred in those investments against ordinary income as opposed to the capital loss method.

Export Licensing Process Too Diffused, Report Says

(Continued from Page 63)

fense, Energy and State, the Central Intelligence Agency and the National Aeronautics and Space Administration (NASA). At each of those agencies, the study also found, "applications may be referred to a number of specialists for technical review."

At the OEA, applications are managed and reviewed by the Operations Division, one of several licensing divisions, the Policy Planning Division and Exporters Services. Commerce makes final licensing decisions unilaterally in some instances; in others, decisions usually are made only after the unanimous consent of the consulted agencies is secured.

Not only is the licensing process inefficiently structured, the GAO found, but the efficiency of the system as it exists is getting worse.

According to the GAO, while the total number of license applications increased by 5% in 1977 over 1976, the number of applications taking more than 30 days to process increased by 47%, applications taking 90 days to process increased by 52% and those taking 180 days increased by 50%.

The convoluted series of reviews and approvals necessary before a license for export of sophisticated electronic equipment is granted explains the delays DP vendors experience. But according to the GAO report, it could be much worse. OEA's computer division is aided by an automated system, the "License Accounting and Review System," that can relate the licensing history for computers to pending applications.

That system, the GAO said, is the only one of its kind in the OEA. And the GAO was so impressed with the enhanced efficiency afforded by that system, it recommended it be expanded to give OEA an automated system for retrieving "precedential information" about other types of commodities.

Stating "the government has an obligation to sellers to ensure that the decision-making process itself does not damage a new or continuing business relationship," the GAO report offered several other recommendations for making the license application review process more responsive to industry.

"Responsiveness to exporters can best be increased," the GAO said, by consolidating management responsibility in the Commerce Department, while continuing to retain the "government's corps of technicians at each of the existing agencies."

Responsibility for making technical evaluations should rest, "as it does now, with technicians in each department and agency comprising the consulting system," the report recommended.

The OEA should consolidate all technical evaluations, it added.

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Victor D. Poor
Senior Vice President, Research and Development, Datapoint Corporation
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Dr. J. Egil Juliussen
Senior Member, Technical Staff, Texas Instruments Corporation Engineering Staff
"Semi-Conductor Technology: Driving Force for Computer Systems." Can current computer architecture/designs effectively utilize 64K storage chips, bubbles, CCDs, fiber optic cables, etc.?

Dr. Eugene I. Lowenthal
Vice President, Advanced Product Planning, MRI Systems Corporation
"Database-Centered Architecture and Processors." The back-end file processor's impact on the user and vendor; strengths/weaknesses of the database-processor approach.

Asa W. Lanum
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"User Opportunities to Improve Software Investment Pay-Off." Can new software be combined with old to produce more effective end-user operation? How does hardware enhance or stifle the potential?

C. Oakley Mertz,
Vice President, Research, International Data Corporation
"The User Customer Base and Systems Migration Dynamics; Impact of Distributed Processing." IDC's migration study — how fast are users moving to newer systems, networks (SNA/SDLC) and distributed processing? What is the likely impact on computer usage in the 1980's?

James E. Thornton
President, Network Systems Corporation
"New Alternatives in Systems Architecture." Will conversion/migration between non-compatible systems be easier by 1982/83? More or less costly? And what innovative architecture choices are open to users now?

James McGuire
President, Computer Division, National CSS
"Computer Services, User Hardware Hybrid Systems." Why are the service companies now supplying their own hardware? What's next?

Dr. James W. Jewett
Vanderbilt University, and President, Telco Research Group
"Communications Systems — Optimizing 1980 Alternatives." How can users select from new carrier offerings in the packet and satellite areas? What compromises and trade-offs are needed with existing communication network investment?

Additional speakers to be announced.

Richard L. Nolan,
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"Planning to Manage the New Systems Technology in the 1980's." Managing and adapting to fast-paced changes in technology and marketplaces; cost-benefits analysis and cost control.

Profits Could Outweigh Problems

U.S. Computer Exports to Japan Seen Profitable

COSTA MESA, Calif. — The export of U.S. computer products to Japan raises difficulties, but the potential profits outweigh the problems, a U.S. computer industry executive said here at a recent international trade symposium.

Speaking before the U.S.-Japan Symposium on "Trade Imbalances: Business Opportunities in Fact," Donald F. Orr, vice-president and general manager of Pertec Computer Corp.'s (PCC) Business Systems Division, said any exporter who has established a position in the Japanese market can attest to its importance. "The key to success is understanding the market differences so they do not become obstacles in penetrating this vast, rapidly expanding market."

Japan's gross domestic product grew at a rate of 28% over the past five years, Orr noted. The installed computer base there is the largest outside the U.S., but computer exports to Japan rank below those to Italy.

Paternal Practices

"The Japanese economic and political scene is stable, and no other market offers greater potential for the U.S. computer exporter; the problem is getting started," Orr noted.

Traditionally, Japan's business philosophy makes many commercial practices there more paternal, he explained. It takes longer to obtain decisions which are often the result of committee action.

In addition, the Ministry of International Trade and Industry (Miti) exerts strong government influence on marketing activities.

"The best approach to the Japanese market appears to be through the classical dealer and distributor relationship," Orr suggested. "Since opportunities to buy a Japanese company are rare, and direct operations carry the risks and problems of addressing an unfamiliar market, the dealer and distributor route appeals to many U.S. firms."

U.S. exporters seeking potential distributors in Japan can turn to trading company subsidiaries, the equivalent to the U.S. conglomerate. These subsidiaries have great strength in Japan.

"They are financially backed, have sound reputations and seasoned management. Many have U.S. operations with offices in New York and Los Angeles," Orr said.

Other agencies that provide assistance in locating Japanese distributors include the trade shows in Asia sponsored by the U.S. Department of Commerce, the Tokyo Trade Center, the Japan Trade Center in Los Angeles and the Japan Trade Association.

Slow, Orderly Approach

After a vendor finds a trading partner, it should expect a longer than usual period for start-up, since Japanese companies may take a slow, orderly approach to introducing a product, Orr pointed out. For computer products, this may include rewriting or modifying software, translation of literature and inclusion of Katakana — a Japanese business alphabet — in keyboards or CRT screens.

It helps if the distributor sends technical staff to the U.S., but there is often little the supplier can do to assist translation. The start-up process may be frustrating, Orr said, but it is a necessary and valuable step in building a faithful, long-term business partnership.

The U.S.-Japan symposium was jointly sponsored by the U.S. and Japanese governments as well as trade associations and universities in the Orange County area with the cooperation of the Orange County (Calif.) Chamber of Commerce.

Data 100 Accepts Bid By Northern Telecom

MINNEAPOLIS — Shareholders of Data 100 Corp. have approved the acquisition of the company by Northern Telecom Ltd. of Montreal.

Under the terms of the acquisition, Data 100 stockholders will receive $20 for each share of common stock. Data 100 will become a wholly owned subsidiary of Northern Telecom and will be managed by Northern Telecom Systems Corp. along with Sycor Corp., which has recently been acquired by Northern Telecom.

The final merger supersedes an agreement in principle reached last May under which Data 100 agreed to merge with McDonnell Douglas Corp. [CW, June 25].

Northern Telecom recently agreed in principle to sell most of the assets of its Nedco and Zentronics Ltd. units to Westburne International Ltd.

Host Organization and Registration Information

IITI The International Information Technology Institute, the program manager, is a non-profit organization chartered to provide professional development and educational support to information systems executives. It draws on the skills and experience of highly qualified consultants, users, vendors, and university researchers to address key issues in information systems planning, applications, computing economics and technology assessment. IITI programs emphasize practical presentations by skilled speakers, as well as audience involvement in pre-conference studies and issue definition.

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Growth of Voice Communications on Horizon

NEW YORK — The use of voice communications for data input and output in both industry and the home will grow substantially starting next year and into the 1980s.'

That was the conclusion of a Qantum Science Corp.'s "Speech Processing Technology Report," which further predicted that speech recognition, speaker verification and digital speech synthesis will be the most widely used speech processing applications.

While most of these systems are still experimental and the few that are commercially available have limited technical capabilities, two factors will spark greater acceptance of speech to interface man with machine,' according to the report.

One is the rapidly decreasing cost of digital storage and processing and the other is what the report called a long-term trend in information processing to accommodate human rather than machine characteristics.

Voice communications offers certain advantages over machine-compatible I/O media such as kevboards or character displays, the report said. Among speech's benefits are that it:

- Is convenient.
- Already has a communications network with terminals — the telephone system.
- Can be used as an alternative channel when hands or eyes are otherwise occupied.
- Provides faster input to machines, especially when combined with human creative efforts.

Speech's Disadvantages

However, speech, which evolved for human communication, does not lend itself to simple machine programming because it is noise-tolerant, can correct errors at several levels and conveys information through its symbols in a non sequential, context-independent manner, the report pointed out. By contrast, keyboards or character displays usually encode and decode context-independent information sequentially.

Because of these differences, speech processing requires greater computational resources. Technological advances in speech recognition, speaker verification and digital speech synthesis, therefore, have been slow in coming but will proceed at a faster pace as a result of electronic component price reductions.

Today, speech recognition capabilities fall into three categories: limited vocabulary control and command language systems, large vocabulary natural language systems and systems that can extract a limited amount of information from speech.

Limited vocabulary speech input systems are commercially available from Threshold Technology, Inc., Dialog Systems, Inc. and Interstate Electronics, Inc. for a minimum of about $10,000 for a single terminal, the report noted.

Component price reductions are expected to bring system prices down and increase sales volumes. For example, the report predicted a 60-word vocabulary recognition terminal will cost $4,000 to $5,000 in 1979, less than $2,000 by 1981 and about $500 in OEM quantities by 1985.

Between 1982 and 1984, office product and electronic firms will dominate the market for limited-vocabulary, continuous speech recognition systems.

Bell Laboratories, Univac and Xerox Corp. are among those firms actively researching limited-vocabulary speech input systems.

Large vocabulary natural language systems have not yet moved out of the research and development stage, and the report predicted they will not be commercially available before 1985.

Present research efforts in this area are limited to Carnegie-Mellon University and IBM. IBM has achieved 71% word recognition from a subset of natural text using a 1,000-word vocabulary by executing about 80 million instructions for each second of speech on a 370 system.

For real-time processing, this is equivalent to 30 IBM 370/168s or about 500 16-bit microcomputers, the report noted.

With Acceptance, Growth

Use of speaker verification and digital speech processing systems will grow as speech recognition is more widely accepted, the report said. Presently at the R&D level, speaker verification systems will be commercially available from 1980 as extensions of speech recognition systems and by 1984 as text-independent systems for high-security control functions.

Availability will depend on lower storage and computation costs, according to the report. Today, storage costs for text-dependent systems are about 25 cents per user for reference data, while it costs up to 5 cents for one identification with a large, general-purpose computer and under 1 cent when a microcomputer system with analog preprocessing is used.

Heading the research effort in speaker verification are Bell Labs and Texas Instruments, Inc., which installed an operational entry control system.

Two Synthesizers

The two types of systems being used for speech synthesis are word synthesis systems, marketed at $2,000 to $4,000 per system, and experimental systems that synthesize sentences.

By 1981, the report said, word synthesizers will be available for $200 to $400 and by 1985 they will cost about $100.

The study is available to Management Action Program in Technology subscribers for $19,000 and to nonsubscribers for $24,000 from the company at 245 Park Ave., New York, N.Y. 10017.

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HP Signs Contract With Nationalist Chinese

PALO ALTO, Calif. — Hewlett-Packard Co. has signed a contract with the visiting Republic of China trade mission for more than $485,000 worth of DP equipment. The purchase is part of an ongoing effort by the Nationalist Chinese to reduce their trade surplus with the U.S., according to a company spokesman.

The 45-member trade mission made its first stop in San Francisco recently to sign prearranged contracts and hold seminars for U.S. business executives. The group then embarked on a 45-day, 20-state tour during which it expects to purchase more than $500 million worth of U.S. agricultural and industrial products, the spokesman said.

The HP contract is for three HP 1000 computer systems and peripheral equipment to be installed next May at the headquarters of the Taiwan Telecommunication Administration (TTA) in Taipei. The systems will modernize the present manual method of logging and managing telephone equipment trouble called in by customers, the spokesman said.

The initial system will consist of two linked HP 1000s connected to 55 HP CRT terminals, which will be used by operators to enter subscribers' trouble reports. Six disk drives, each with a data storage capacity of 50 million bytes, will be accessible by both computers for data retrieval and data base updates, the spokesman noted.

Repair update information will be entered into the system via nine printing terminals located in TTA's district and repair offices throughout Taipei. The third HP 1000 will be used as a backup system.

George Cobbe, marketing manager for HP's Intercontinental Operations, said, "The order came less than a year after TTA's order for more than $850,000 worth of computers and peripherals for computerized telephone director inquiry systems. The seven HP 1000s installed earlier this year modernized TTA's manual method of finding customer phone numbers."

Other Contracts

Kennedy Co. has been awarded a contract in excess of $250,000 by Seiko of Tokyo, Japan for its Model 9100 tape transport to be used in Seiko's IBM Series/1-based small business systems. This agreement is for two years with renewal options.

General Automation, Inc. has received a contract from the Montana Energy and MHD Research and Development Institute, Inc. to design, develop and install a distributed data acquisition network valued at more than $1 million.

Computer Sciences Corp. has been awarded a $129.6 million contract to process claims for California's Medi-Cal program. The contract runs for five and a half years.

Univac Corp. has been awarded a contract by the Internal Revenue Service Data Center in Detroit for a Univac 1100/82.

Logicon, Inc. has received a $2.1 million Air Force contract to continue its work in the design and development of a new North American air surveillance system.

Ontel Corp., a subsidiary of Caesars World, Inc., has received an OEM contract valued at more than $1.5 million from Control Data Corp. The contract calls for a two-year shipment of the basic display terminal Ontel also uses in its proprietary OP-1 intelligent terminal system.

Rockwell International's Electronic Systems Group has been awarded a $12 million contract by the U.S. Air Force for Transportable communications systems.

Cubic Corp. has been awarded two contracts totaling $13.7 million by the Hong Kong Mass Transit Railway Corp. for automated far collection equipment.

Contracts

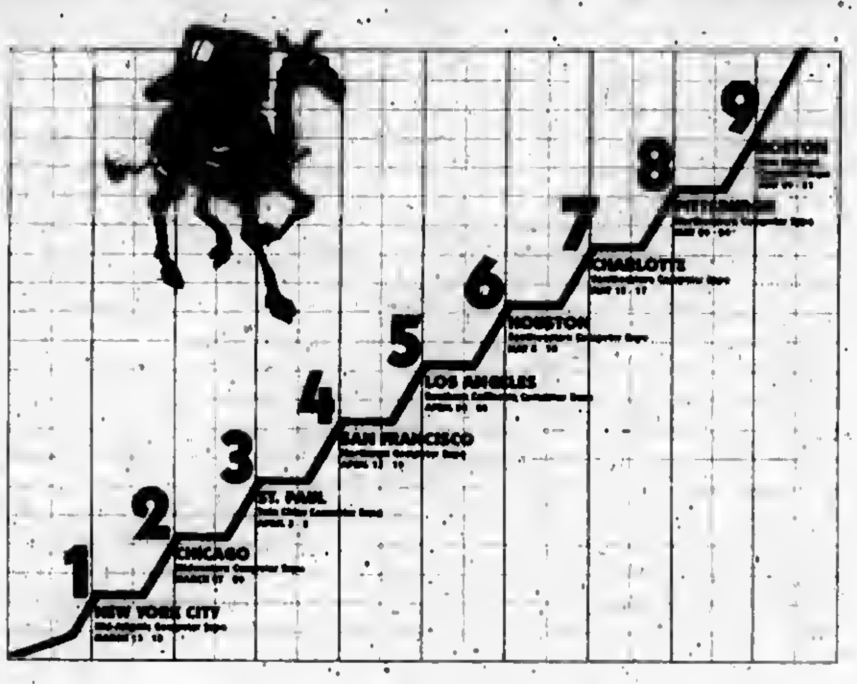
Control Data Corp. has received a $1.2 million contract for a central DP system at Patrick Air Force Base, Fla. The system will provide range safety data for the Trident missile test program.

Computer Devices, Inc. has signed a contract to provide more than 400 desk-top time-sharing terminals to Interactive Data Corp.

The U.S. General Services Administration (GSA) has awarded 11 contracts worth $25.6 million. Five of the contracts were awarded to small businesses: CPT Corp., Capitol Consultant Services, American Hospital Supply, Norward Industries Inc. and Alliance Rubber Co. Other contracts were awarded to Eastman Kodak Co., Addressograph-Multigraph Corp., Dictaphone Corp., General Electric Co., Tektronix, Inc. and Hewlett-Packard Co.

Comshare, Inc. has finalized a four-year contract with Dayton-Hudson Corp. No other details of the contract have been made available.

9 STEPS TO PROFITS!



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Industrial Relations Dept.
P.O. Box 1483
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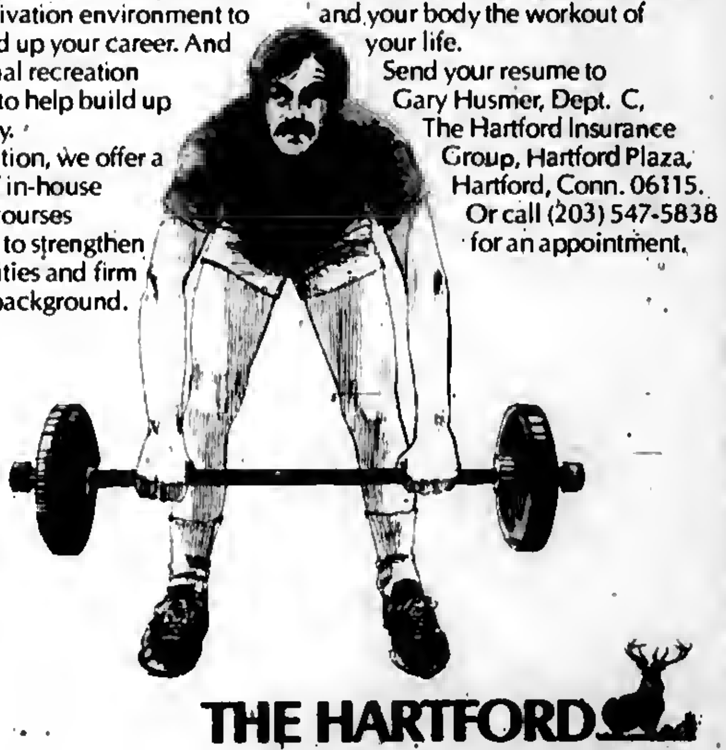

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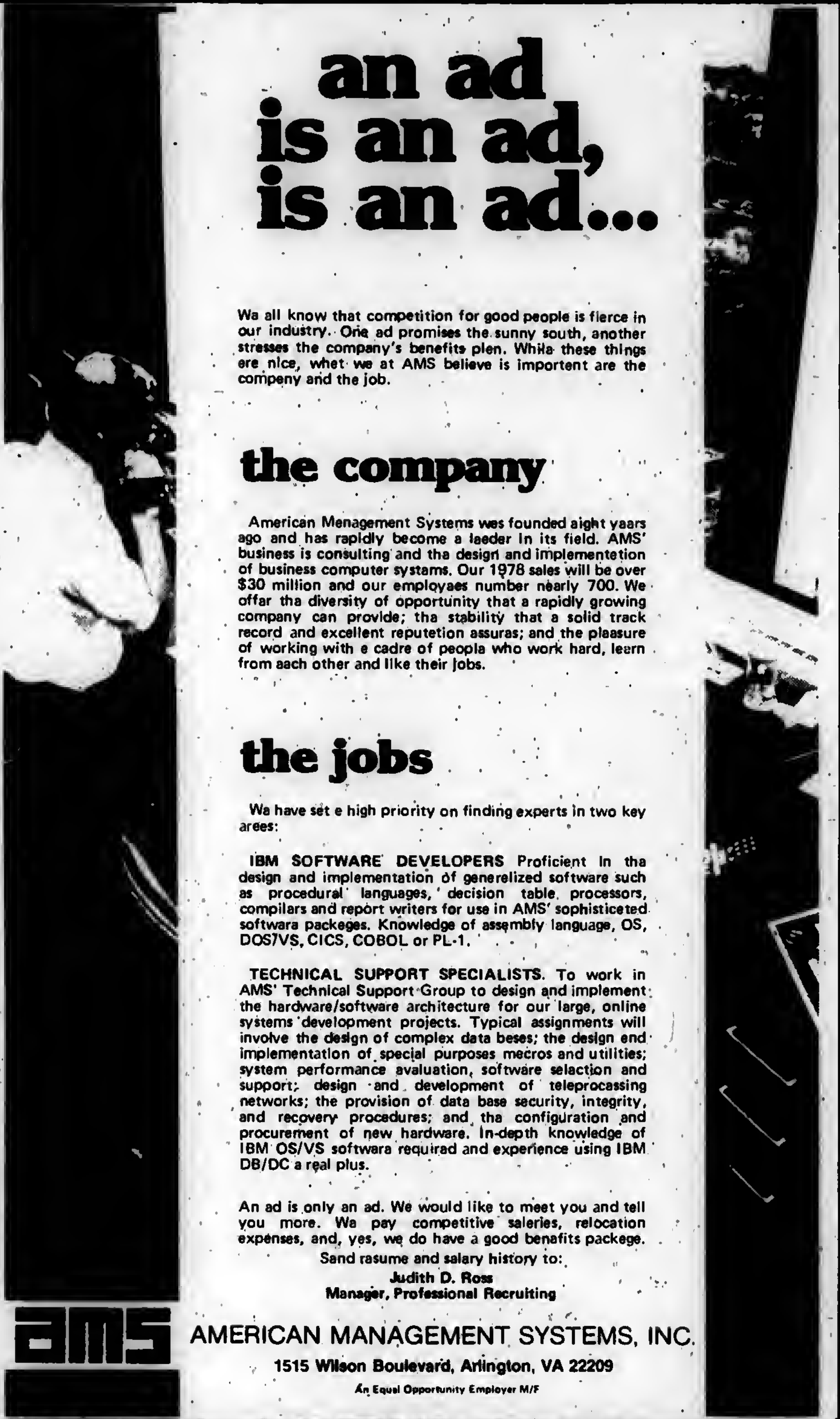

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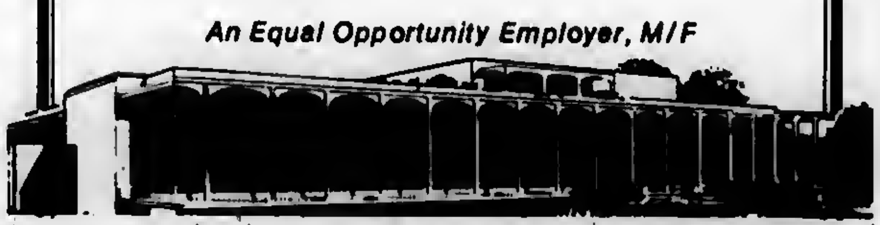

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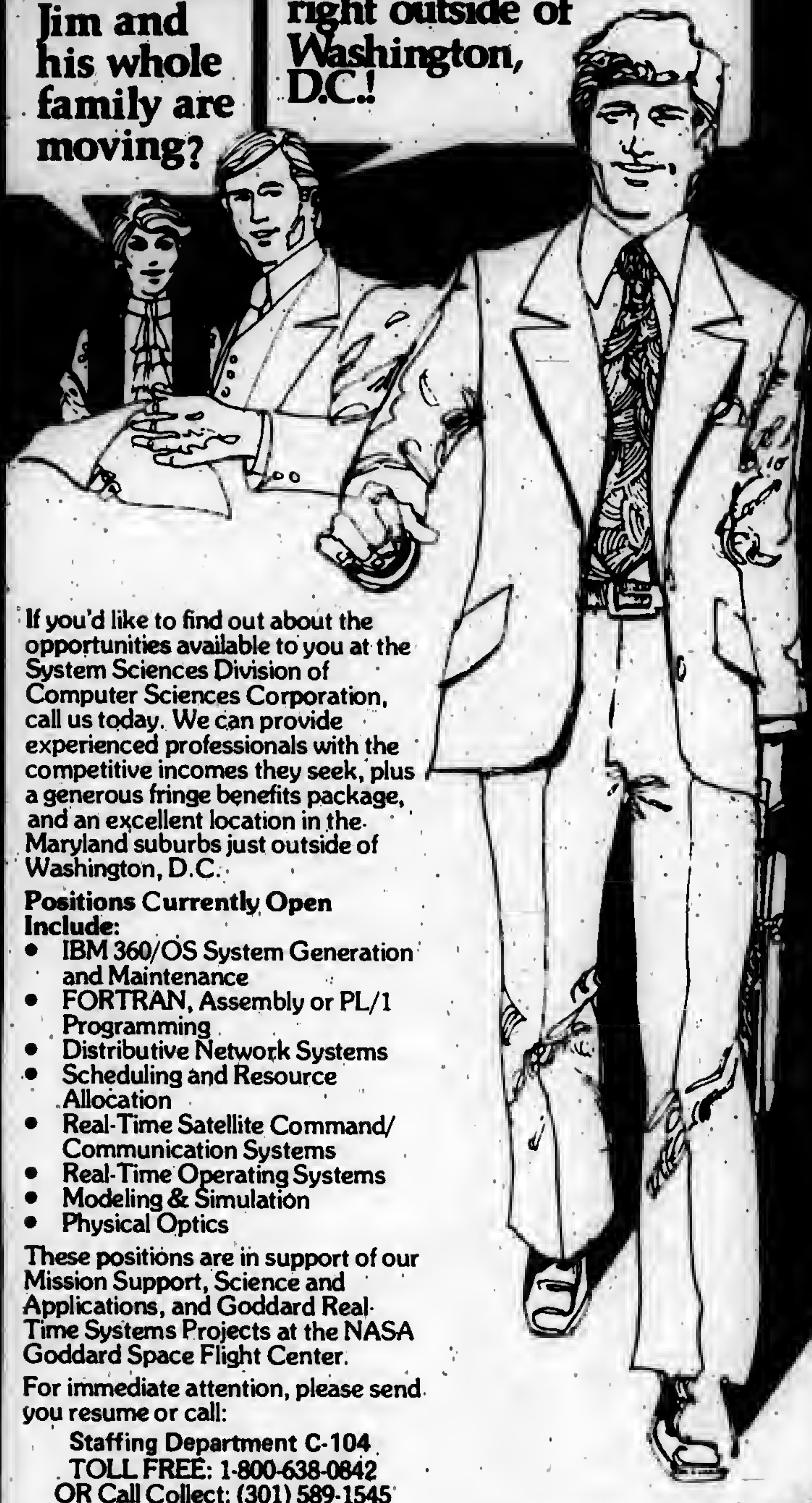
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4. Develops budgets and recommends, hires, promotions and terminations of data systems staff consistent with the required workload.
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2. Seven (7) years of progressively responsible management experience with three (3) years successful administrative experience directing data processing activities on IBM-370 equipment and development of comprehensive management information system.
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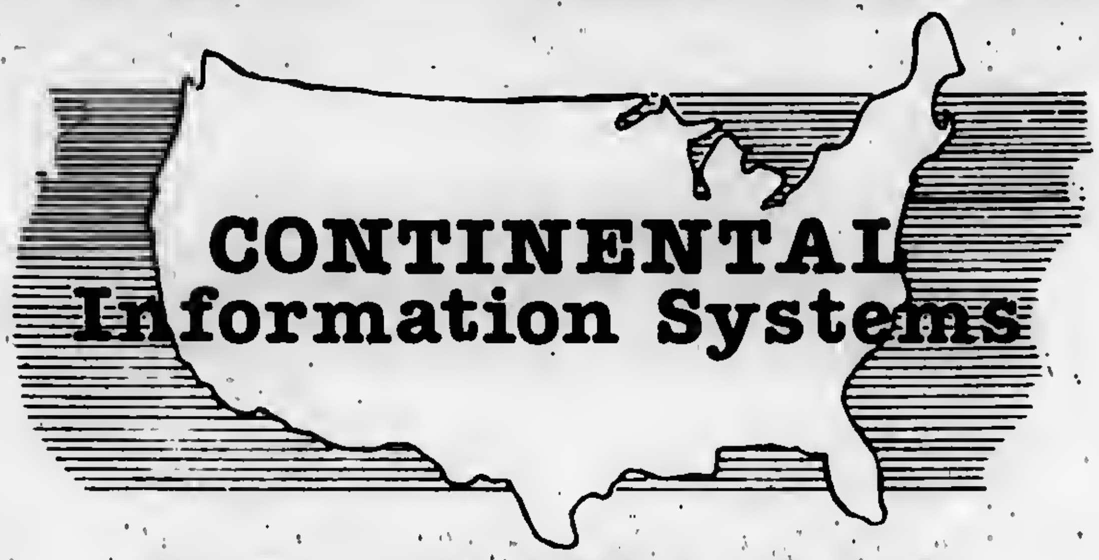

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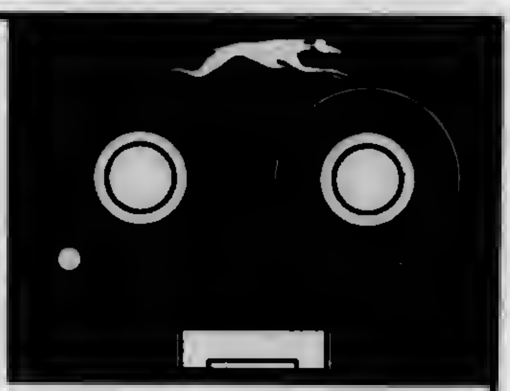

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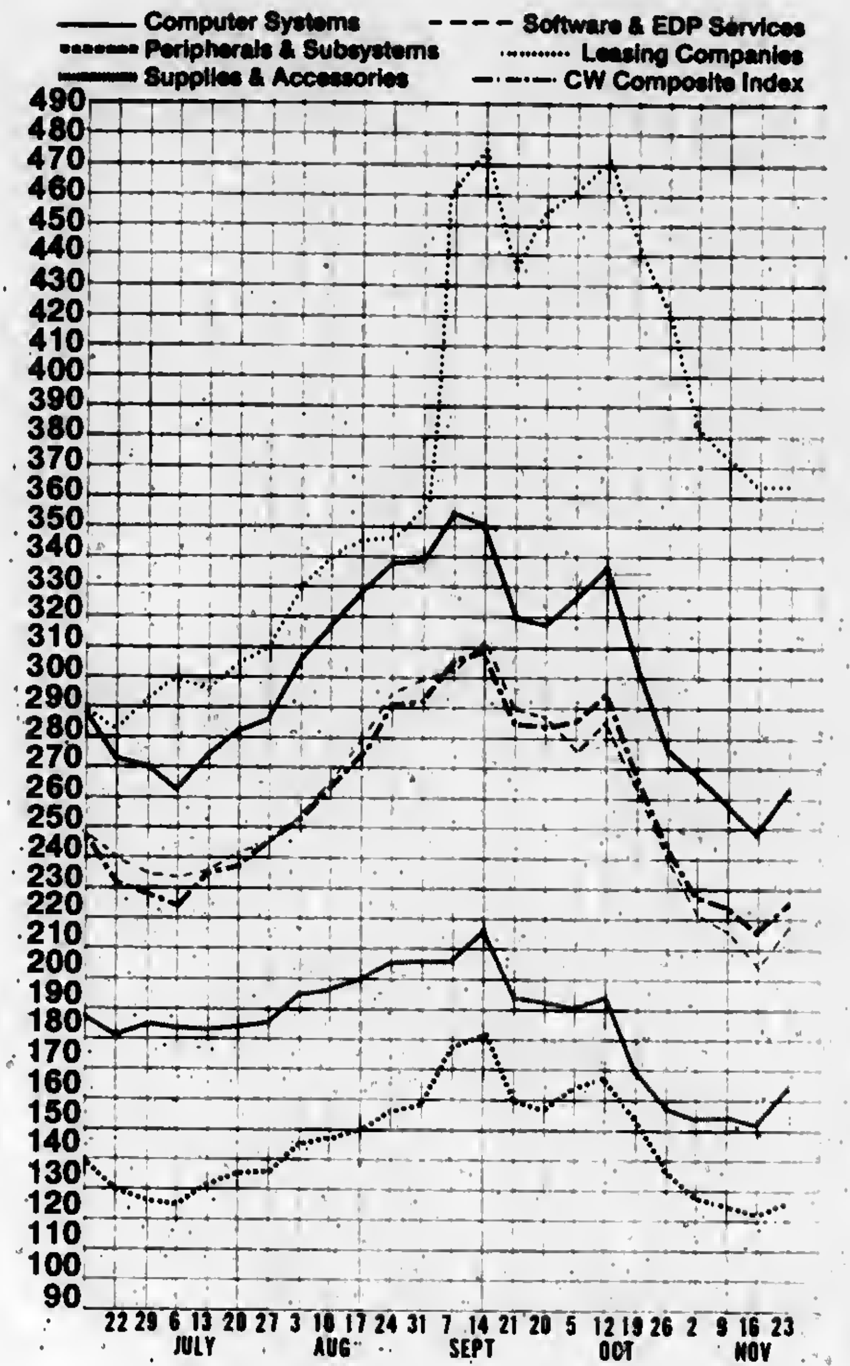

Earnings Reports

ANALOGIC
Year Ended July 31

	1978	a1977
Shr Ernd	$.93	b $.66
Revenue	35,145,869	24,300,306
Earnings	3,052,822	1,862,334

a-Restated to reflect acquisition of Data Precision Corp. in July 1978. b-Adjusted for 100% stock dividend paid in September 1978..

APPLIED DATA RESEARCH
Three Months Ended Sept. 30

	1978	a1977
Shr Ernd	$.37	$.30
Revenue	5,550,437	4,271,092
Disc Op Loss	.....	61,226
Earnings	527,666	412,691
9 Mo Shr	.86	.85
Revenue	14,902,133	12,016,238
Disc Op Loss	.....	61,662
Earnings	1,232,902	1,157,176

a-Restated.

CENTRONICS DATA COMPUTER
Three Months Ended Sept. 30

	1978	1977
Shr Ernd	$.36	$.53
Revenue	21,644,695	15,625,966
Earnings	2,129,971	3,063,006

COMDISCO
Year Ended Sept. 30

	1978	a1977
Shr Ernd	$1.45	b$1.03
Revenue	153,282,265	112,727,866
Earnings	4,921,581	3,280,697
3 Mo Shr	.58	b.32
Revenue	52,176,061	29,162,503
Earnings	1,891,961	1,020,735

a-Restated to reflect accounting change for leases. b-Adjusted to reflect two-for-one stock split paid in September 1978 and three-for-two stock split paid in March 1978.

COMPUTER AUTOMATION
Three Months Ended Sept. 30

	1978	1977
Shr Ernd	.....	$.66
Revenue	$13,115,000	11,963,000
Earnings	(661,000)	1,315,000

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Computerworld Stock Trading Summary

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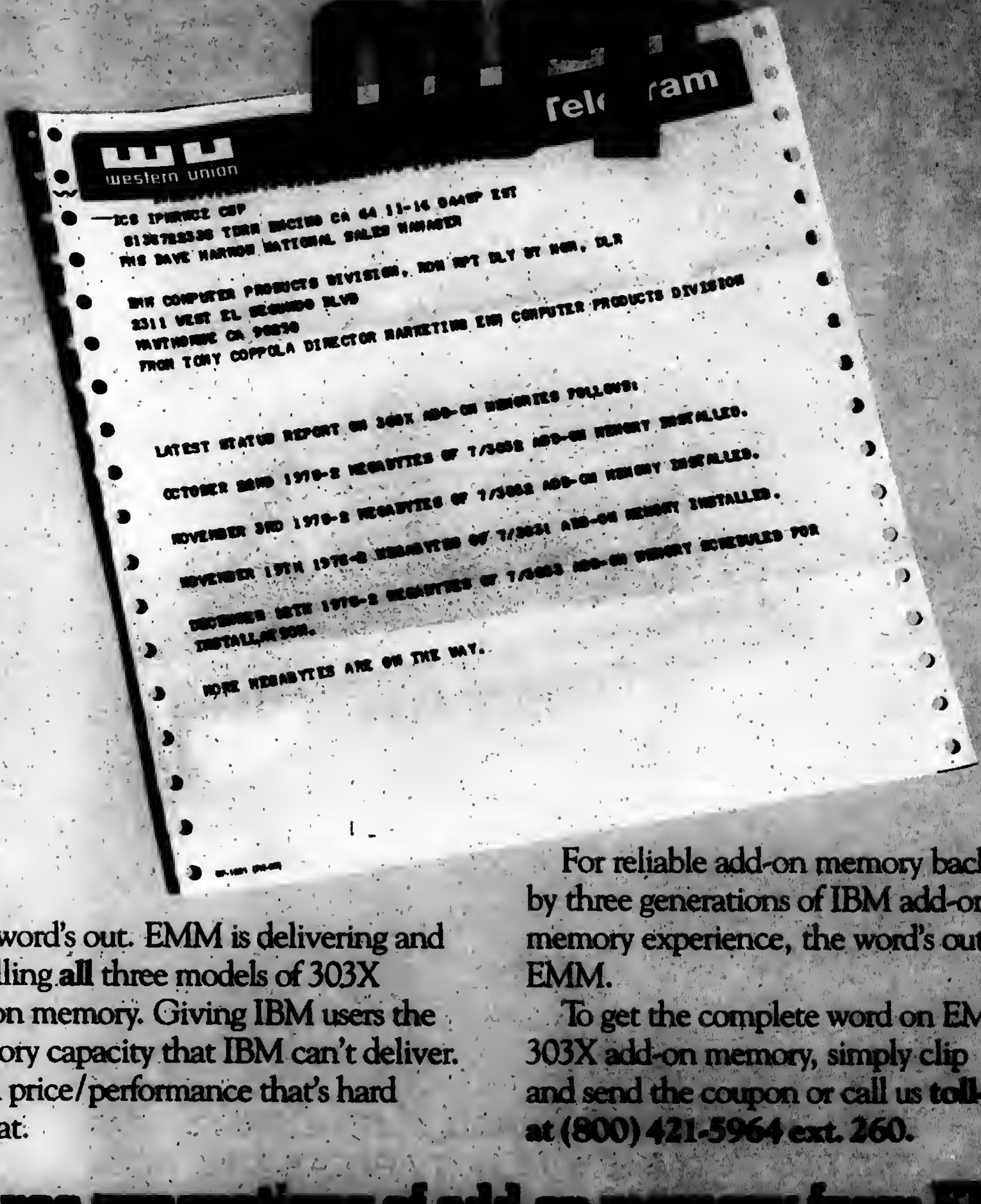
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NEWSPAPER

win Newman ves DP Jargon assing Grade

By Jeffry Beeler
CW Staff

BOSTON — Despite a penchant for leaden technical jargon, people in the U.S. computer industry are no more guilty of misusing English than any other segment of the population, according to noted NBC-TV news commentator and author Edwin Newman.

On the other hand, computer people have probably contributed as much as most groups to the lamentable decline in the American public's ability to speak and write effectively, said Newman, the featured speaker at last week's joint symposium of Wang Laboratories, Inc. computer and word processing systems users.

Newman, whose public appearances and books — especially the best selling *Strictly Speaking* — have made him one of the nation's leading champions of correct usage and plain talk, was relatively generous in his appraisal of DPers' communications skills. When asked after his address how computer people compare to the rest of the population in language proficiency, the NBC newsman replied, "I understand the computer industry's need for a special language to communicate its ideas, and when I attended a Wang product demonstration earlier in the day I was surprised at the conciseness of the presentation."

Although he stops far short of praising "com-

(Continued on Page 7)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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CW Photo by M. Zientara

In U.S. at Last

Russian computer programmer Boris Katz has arrived in the U.S. after a three-year struggle to leave the Soviet Union, and he and his 13-month-old daughter Jessica shared an issue of *Computerworld* last week. See story on Page 4.

IBM Drops Memory Prices, Doubles Capacity of 3033

By Howard A. Karten
CW Staff

WHITE PLAINS, N.Y. — IBM slashed memory prices by 30% last week in a move that industry analysts said may presage the introduction of the firm's long-expected E and H series of computers.

The firm also announced the doubling of the maximum main memory on its 3033 system. Coupled with the overall memory price cuts, this action was seen by the analysts as an "aggressive" move against IBM's plug-compatible competition.

Purchase prices on Mosfet memory for the 370 and 30 series computers were cut by approximately 30% from the firm's previous $110,000 per 1M byte to $75,000. Rental prices on the same units, however, were reduced by only 20%.

The prices for memory on the 3704 and 3705-II communications controllers were cut by a similar amount, the firm said.

The systems affected are the 370 models 115, 125, 138, 148, 158 and 168, IBM said, as well as the 3031, 3032 and 3033 processors. The 370/135 and 145, which use bipolar technology, were not affected, nor were the 155 and 165 and the 3705-I communications controller, all of which use core technology.

Purchase price reductions are effective immediately. Lease and rental reductions will take effect on Jan. 1

4K-Bit Chip for 3033

Along with the price cuts, the company announced the introduction of a 4K-bit chip that will be used in the 3033. That chip will allow customers to put a maximum of 12M or 16M bytes of memory on the processor; it will become available in the third quarter of 1979.

The 3033 had previously been limited to 6M or 8M bytes of memory by IBM, although several independent memory makers have announced the ability to attach 16M bytes of memory to the processor

The doubled 3033 will take up the same amount of space as the older 3033 using 2K chips, IBM said. The two kinds of chips are not compatible, the company noted, but added that 2K-version 3033s are field-upgradable.

Other sources indicated, however, that IBM may be buying the 4K-bit chips from outside suppliers for at least some of its needs.

'No Surprise'

Most industry analysts last week said the price cuts were "expected" and "no surprise." The moves show a growing competitiveness on the part of IBM and indicate the firm is about to bring out a new range of computers, they maintained.

IBM's previous price of $110,000 per 1M byte of memory "stood out like a sore thumb" among its competitors, which offer 1M byte of memory for

(Continued on Page 8)

Carter Readying Privacy Initiative

By E. Drake Lundell Jr.
CW Staff

WASHINGTON, D.C. — The Carter Administration will launch a major "initiative" in the privacy arena early next year, according to informed sources here.

The initiative, which may receive mention in the President's upcoming State of the Union message, will deal primarily with the privacy of medical, credit and insurance records, the sources said. It may also deal with the amount and type of data that police agencies can collect from private sources without a warrant or subpoena.

The final outlines of the issues Carter has to resolve for the initiative are being hammered out here by a group led by Richard Neustadt, assistant director of the White House Domestic Policy Staff. Input has come from the National Telecommunications and Information Administration (NTIA), the Department of Justice, the Department of the Treasury and the Office of Management and Budget, among others.

The options' list is being drawn from all the recommendations of the Privacy Protection Study Commission, submitted in July of last year, Neustadt said last week. The President has not yet decided on the priority items, he added

The commission was mandated to recommend privacy action in the private sector. Neustadt said it is unlikely that action will be taken in all areas of the Privacy Commission report "simultaneously" and that the legislative initiatives next year will be limited.

Next year's initiatives will most likely deal with credit, insurance and medical recordkeeping practices, other sources

(Continued on Page 8)

London 'Times' Shuts Down

By Rex Malik
Special to CW

LONDON — The venerable *Times* was shut down here last week in a dispute that involves the introduction of computer-based typesetting equipment, and no one knows when — or if — the 197-year-old institution will publish again.

Times newspapers also closed *The Sunday Times, the Times Higher Education Supplement* and the *Times Literary Supplement*, jolting the reading habits of the British establishment, which has regarded *The Times* as its quintessential mouthpiece through the years.

The major stumbling block in *The Times* negotiations with its unions involved the use by journalists of computer-based systems to enter stories directly into the paper's computerized typesetting systems. The local in-house union — or chapel — of the National Graphical Association (NGA) contended that such a move would eliminate many of its members' jobs.

The NGA said while it welcomes

(Continued on Page 6)

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Says Industry Not Helping

U.S. Defends Work on Data Policy

By E. Drake Lundell Jr.
CW Staff

NEW YORK — Exemplifying the adage that turnabout is fair play, government officials indicated here last week that they have been hard at work drafting U.S. policies for transborder data flow regulations and that industry's response and input have been lacking.

Reacting to criticism from computer users within large multinational corporations that a U.S. policy is lacking in this area [CW, Dec. 4], several Administration officials said the criticism was "unfair."

At a session on "Data Regulation: European and Third World Realities" sponsored by On-Line Conferences Ltd., William Fishman from the National Telecommunications and Information Administration (NTIA) told a group of concerned industry members that "we have been trying to get more industry involvement" in formulating U.S. policy.

The NTIA is drafting guidelines for U.S. delegates on negotiating transborder data flow issues, which are expected to be ready by July 1979, Fishman noted.

The government has been looking for examples where European countries' privacy and transborder data flow regulations have had an economic impact on business.

If that impact is not too severe, it may not call for U.S. action, and meeting the regulations may just be the cost of doing business in those countries, he said, adding that so far "I don't think the response from industry has been good."

Fishman added that the NTIA "has made a fairly vigorous effort to get reaction "by attending meetings of computer users concerned with the issue and through articles in the trade press."

In addition, Richard Neustadt, assistant director of the White House Domestic Policy Staff, assured the group he would be glad to arrange a meeting for them in Washington with policymakers in this area, and he urged them to provide more input to the process of formulating policy.

"We need your help," Neustadt said, "and look forward to hearing from you."

He also noted, however, that the group's concerns about the lack of a central authority within the government for studying these issues was "well taken," but added that the ability of such a central authority to act on complaints about privacy abuses "will be limited" without regulatory authority over the operation of data banks.

Furthermore, Neustadt told the group it should contact Fishman or Morris Crawford in the State Department's Office of Bilateral and Multilateral Science and Technology Programs about their concerns.

Crawford, who was also on the panel, indicated there is general agreement on what amount of data protection should be afforded to individuals both here and in Europe.

The difference between the two areas, however, is in the machinery needed to provide data protection, he said.

Electronic Mail Meet Today

WASHINGTON, D.C. — Vendors, large-scale mainframe users and executives interested in electronic mail and communications technology will participate here today and tomorrow in a series of task groups organized by the American National Standards Institute (Ansi) in cooperation with the Computer and Business Equipment Manufacturers Association (Cbema).

The three task groups — X4, X4812 and X4812/WG-4 — will deal with office machines, word processing and the formation of specific working groups, respectively. They will attempt to define as completely as possible standard requirements to enable different vendors' equipment to eventually communicate with each other, said group coordinator Roger Myers.

The meetings will discuss communication standards for protocols, end-line tailoring, line speeds, transmission modes, communications control codes and signal types.

Interested individuals and societies can call Myers directly at (202) 447-4437.

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A message from John R. Bennett
President of Applied Data Research
Princeton, New Jersey

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John R. Bennett, President
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Two Programmers Make It to the U.S. at Last

By Marguerite Zientara
CW Staff

CW Photo by M. Zientara

Boris and Natalia Katz with 13-month-old Jessica relax at the home of Katz's mother after their long-awaited journey to the U.S.

CAMBRIDGE, Mass. — Two Russian computer programmers arrived here with their family 11 days ago after a three-year struggle with the Soviet government to emigrate to the U.S.

Boris and Natalia Katz's desire to leave the Soviet Union became an urgent need when their first child, Jessica, was born in September 1977 with a rare ailment that Soviet doctors claimed they could not treat. Through the intervention of several American groups dedicated to helping Soviet Jews leave the Soviet Union, as well as help from Sen. Edward M. Kennedy (D-Mass.), the Katzes finally got permission to leave Russia six weeks ago and arrived here Nov. 30.

When asked the reason for his original application in 1975 to leave the Soviet Union, Boris Katz explained, "My understanding of truth and lies is very different from the understanding of these things by the Soviet government.

"Secondly," he said, "I wanted to be with my family." Since 1975 Katz's mother and two brothers have lived here in Cambridge, where one brother is studying mathematics at Harvard University and the other is a professor of mathematics at MIT.

The soft-spoken scientist and his wife, Natalia, both 31 and both computer programmers, were refused permission to come to the U.S. by Soviet officials on national security grounds. The Soviet officials claimed that Natalia, who worked as a programmer for the government's Institute of Meteorology from 1970 to 1974, had access to confidential information, although Boris Katz denied that was true.

"She worked only in mathematics, but some sections of the Institute of Meteorology dealt with secret work and some people there maybe knew state secrets," he explained. "That is why she was supposed to know confidential information."

When the Katzes decided in 1974 to apply for visas to come to the U.S., Natalia changed jobs and went to work for the Institute of Geophysics in Moscow.

In Russia, when one wants to emigrate, one must give one's employer papers indicating the desire to emigrate. The employer then submits papers to Ovir, the visa office. When Natalia told her employer in 1975 that she wanted to emigrate, she was fired from her job at the Institute of Geophysics. "We applied for jobs [for her] after that, but after applying for emigration form Russia, it's very difficult to find work," Katz said.

Katz himself worked for eight years as a programmer for the Scientific Institute to Research Tractors after having graduated from the University of Moscow in 1970. His work for the institute, which is dedicated to the improvement of tractors, involved statistical and economical problems related to such improvement.

The Katzes persisted in their efforts to leave the Soviet Union after applying in 1975. In September 1977 their daughter Jessica was born suffering from malabsorption syndrome. The rare ailment meant that Jessica could not digest food, had diarrhea and gained no weight from the age of two months until she was six months old, although she grew in length about 10 centimeters.

"She was very thin, like a finger, and she was almost dying," Katz recalled. Soviet physicians said they could not treat Jessica, but, through the intervention of Action for Soviet Jewry, a U.S. group working for the release of Jewish families from the Soviet Union, Jessica survived on an American-made formula.

The formula, Pregestimil, was prescribed by Dr. Richard Feinbloom of Cambridge, who diagnosed Jessica's illness over transatlantic telephone. It was carried to Russia in cans by American tourists. With it began the slow but steady improvement of Jessica's health and only now, at 13 months, is she being weaned from it.

"The first delivery of the formula came when Jessica was six months old," Katz said. "If it hadn't come then, I think she wouldn't be alive now."

The Katzes finally got permission to leave the Soviet Union six weeks ago, a month before the birth of their second child, Gabriella, on Nov. 20.

Permission was granted largely through the efforts of Kennedy who, during a visit to the Soviet Union last September, submitted a list of 18 families who wanted to leave Russia to Soviet President Leonid Brezhnev.

While emigration to the U.S. from Russia usually involves a three- to four-month wait in a Rome emigration camp, the Katz family spent one night in Vienna, went to Zurich the next day and, after a half-hour wait, got on the airplane to Boston. Katz credited Kennedy with making his trip so expeditious.

Katz's DP Activities

While working at the Scientific Institute to Research Tractors, Katz also followed other interests in the computer field. From 1972 to 1975, he was a post-graduate student at the Institute of Geophysics, where he studied earthquake prediction techniques. Although there are a relatively large number of earthquakes in Russia, Katz said, his area of interest was California.

In 1976, Katz took a one-year course of study on operating systems given by Siemens Corp.

During these years, Katz had two articles published in the monthly Russian technical journal, *Automatics and Remote Control*. In 1972, he wrote an article describing a computer system he developed that could "grasp" secondary school level mathematical problems about movement.

1. В тумане сумерки остались,
И мой краснеет человек,
Над лесом еля зимовали,
И дикий, мелкий, щедрый снег.
И шепчется волна морская,
Томится тусклое тепло,
Влюбилась робкая, немая,
И шелестит еще стелок.

2. Быстрей – как будто тень спала –
Высокий месяц.
И паутина умерла
Зимой над лесом.

3. Умирающий – в смятенья.
Вновь, как тень, огни дрожат,
Вновь над бездною движенья –
Где-то далеке душа...
Крик смертельный рядом, зыбкий,
Тлели в хрустеле глаза,
Шелест мечется с улыбкой,
Где-то в чаще небеса.

4. И позади цветок сереет,
И ясноглазые белеют,
Отточенный спокойно лед.
Как тень, прозрачно утро славит,
И зыбкий музыкант лукавит:
Прозрачно-бледная придет.

1. Twilight remained in mist,
And my man blushas,
In tha woods first wintarad,
And wild, fine, lavish snow.
And sea weves whisper,
Languishes dull warmth,
Timid, dumb, she fell in lova,
And still rustle glasses.

2. Faster — as though a shadow fall —
High moon,
And cobweb died
In winter over tha forest.

3. Dying — in confusion.
Agein, es shedows, fires quiver,
Again ovar an abyss of motion —
Somawhara far is tha soul . . .
A daath cry is near, and unsteady,
Smoldered eyes in crystels,
Rustling is marked by smiles,
Somewhere in the heart of the sky.

4. And a flowar shows gray behind,
And cleareyed whitens,
Steadily sherpened ice.
As a shedow, transparently
glorifies the dewn,
And unstaadily tha musicien
is cunning:
Transparently and pele she
will come.

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These are the first four verses of a 21-verse poem generated by computer using Katz's poetry-writing program. Katz stressed that the English translation is word-for-word and therefore loses much of the Russian version's rhythm.

This year, Katz published an article concerning a complex poetry-writing program, along with examples of computer-generated poetry, one of which is reproduced below with its English translation.

When asked if he is a poet, Katz replied with a smile, "No, my computer is a poet." While his poetry is actually generated by the computer using algorithms, "all the examples I've seen of 'computer poetry' were written not by the computer, but by people claiming it was written by the computer."

Katz hopes to follow his interest in either computer analysis of linguistics or in computer-generated poetry in this country and is presently looking for work, hopefully in those fields.

The most popular — and most powerful — computers in the Soviet Union are the EC series, which are equivalent to the IBM 360 series, Katz said. "EC" stands for Russian words meaning "Equal System" for all the Socialist countries.

When asked about the sophistication of Soviet computer applications, Katz commented, "They try, but it cannot be compared with the applications here." He added, however, that the Soviets now make many more computers than ever before.

He named three Soviet computer manufacturers, but said he did not know the total number of companies that exist. "I don't think somebody is allowed to know that," he said.

Personal Privacy in Russia

Although the Russian publication *Soviet Studies* reported in 1977 that projects were then under way to ensure that Soviet citizens would have access to personal information held by the government, as well as the means to correct inaccurate information, Katz feels "that will never happen in the Soviet Union." He said technical difficulties will hold back such a project for at least 50 years and, furthermore, "the KGB [Soviet secret police] would never allow it.

"No one knows what the Soviet government knows about me," Katz said, "although I know that in America you can ask some questions about what is written about yourself.

"I am sure that in many, many years it will not happen in the Soviet Union," he added.

By emigrating to the U.S., the Katzes, including 21-day-old Gabriella, have lost their Soviet citizenship. Unless something changes in Russia, Katz said, he is not free to ever visit his country, although he would be "very happy to see [my] friends and homeland."

Many of Katz's friends, a large number of whom are computer scientists, also hope to emigrate to the U.S. within the next few years. Katz noted that many computer scientists want to emigrate from Russia and that a large number of "refuseniks" are computer people. "Refusenik" refers to a Russian who has been denied an exit visa.

Since refuseniks feel freer than other citizens to demonstrate against violations of human rights, and since many DPers are refuseniks, Katz said, Soviet DPers are often more politically active than other people in the Soviet Union.

'A Sorry State of Affairs'

NSF Head Slams U.S. for Poor R&D Support

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Federal support of research and development in this country is "a sorry state of affairs," the director of the National Science Foundation (NSF) contended at the Association for Computing Machinery's (ACM) annual meeting here last week.

Delivering the keynote address at ACM '78, Daniel C. Atkinson said the U.S. has "slipped dramatically" in the last decade in its support of basic R&D. That slip has occurred at the same time other industrialized countries substantially increased their R&D funding, he pointed out.

In a speech entitled "Federally Supported Research: Boon or Boondoggle?", Atkinson cited NSF figures indicating that in the 10 years from 1966 to 1976, the percentage of the U.S. gross national product (GNP) spent on R&D declined from 3.1% to 2.2%.

During that same period, R&D funding as a percentage of GNP increased in the Soviet Union from 2.4% to 3.2%, in West Germany from 1.6% to 2.1% and in Japan from 1.4% to 2.1%.

While American industry continued to show a "strong commitment to R&D" in that 10-year period, the emphasis has shifted from long-term research to research programs that will produce a payoff in the short-term, Atkinson said.

President Concerned

That industry trend and the fact that federal funding of R&D dropped from 13% of the federal budget in 1966 to 6% in 1976 have aroused White House worry, according to Atkinson, who characterized President Carter as "very concerned" about R&D and technological innovation in the U.S.

Carter's commitment to increasing R&D in the U.S. is "much more dramatic than some might realize," he said. The President has called for a review of technological innovation in the U.S. which, when completed in the spring, will provide "policy options" for Congress.

In addition, Carter has specifically exempted R&D expenditures from his call for budgetary cutbacks to fight inflation. "There has to be some tax incentives in the system to make sure that industry makes more of a commitment to longer term research," Atkinson said.

Carter has taken the time to "scrutinize" NSF's R&D budget "line by line" to familiarize himself with what the organization is doing in this area, he reported.

NSF has put up $13.9 million this year to support computer science R&D, a figure which Atkinson said represents 40% of all federal funds spent for that purpose. It is a "sorry state of affairs" when his country "commits such a small amount of money to such an important area," he declared.

Myth Destruction Urged

Beyond increasing federal funding of R&D and supporting a strengthened R&D effort in the private sector, Atkinson said it is necessary to assure the health of university R&D programs, especially in computer science, and to attract the best students to the sciences. "The myth" that the sciences are overpopulated and offer little future for bright students must be destroyed.

"We have to build better bridges between our university research groups and our industry groups," he said. The cooperation that formerly existed between the two sectors must be restored; and the federal government should foster that initiative, he believes.

One area in which this country "is lagging and lagging very badly," he said, is in the prodution of scientists from universities who are familiar with the latest developments in industry. Businesses are not as concerned with basic university research as they are with the caliber of students coming from that environment, he noted.

CW At ACM

Addressing that point, Atkinson said it is necessary that universities have the latest in equipment. In the computer science field, that means not only state-of-the-art computers, but also instrumentation and other auxiliary equipment for programs such as artificial intelligence and mechanical engineering.

NSF will soon complete a study on comptuer science and engineering research that will form the basis for federal support of more university R&D programs. In addition, he said, there has to be a greater flow of computer scientists "through the academic pipeline."

In 1977, according to NSF statistics, only 300 Ph.Ds graduated from U.S. universities and only 2,800 persons obtained master's degrees in computer science. This level "in no way meets the needs of the country," Atkinson maintained.

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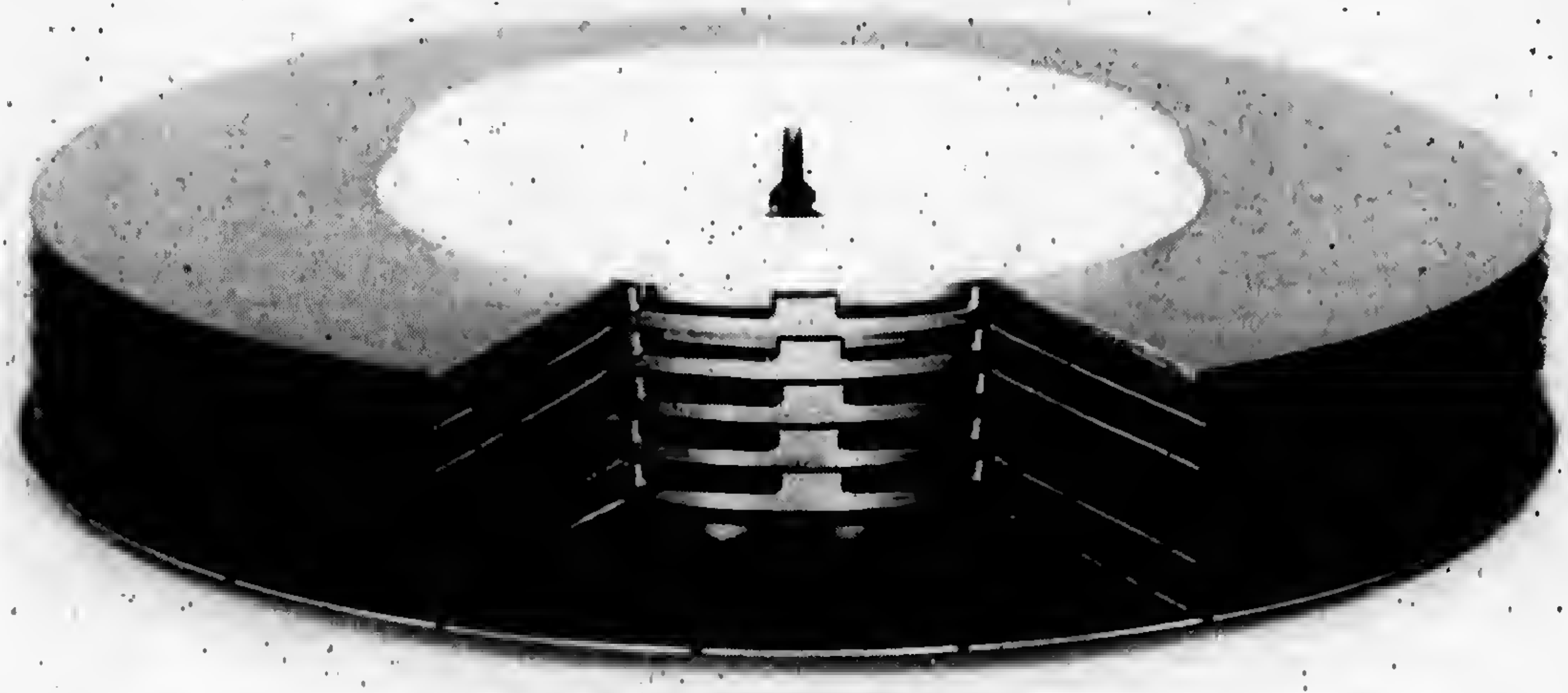

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Typesetting Automation Dispute Shuts Paper

(Continued from Page 1)

new technology such as the computerized systems, it feels that what historically have been NGA functions should always remain so and that NGA members should be the only ones inputting into the system.

The Times had given the seven unions that represent its 4,300 workers until Nov. 30 to agree to negotiate new working methods, a dispute procedure and wage restrictions.

At the same time, management had agreed to higher wages, a voluntary layoff scheme for workers displaced by automation, a pension increase, a vacation increase to six weeks per year and an increase in sick pay.

All of the unions had agreed to at least discuss the proposals except the NGA, causing management to suspend publication when the deadline passed. The NGA has indicated it will not discuss the proposals while the papers are suspended.

The suspension of *The Times*, — with a circulation of about 315,000 — which is the flagship of *Times* newspapers, and the *Sunday Times* — circulation 1.3 million — resulted not only from concern with computerization and job reassignment, but with other issues as well.

Furthermore, the present troubles are not confined to the *Times* group. There have been running battles between management and unions in all the major Fleet Street national papers during the 1970s. Most of these battles have concerned management's contention that featherbedding, or overhiring, was occurring even before the computerization move.

Another major problem concerned unofficial job actions by local unions that either caused the paper to halt printing altogether or to print a reduced number of copies of a particular edition.

According to *The Times* management, the expense problems were increasing. This year *The Times* did not appear altogether on nine days, and it lost four million additional copies through job actions.

The Sunday Times did not appear twice and lost over eight million copies through other job actions, and the supplements lost 600,000 copies through such tactics. Revenue losses totaled almost $8 million.

This was particularly galling for management because although *The Sunday Times* itself had been a profitable paper for a long time, *The Times* was the classic loss leader. At one time in the '70s it was losing $6 million a year. Its accumulated losses at the start of 1978 were more than $20 million.

However, a turnaround was in the cards and Duke Hussey, chief executive of *Times* newspapers, was forecasting a profit for *The Times* of more than $1 million this year.

As far as management is concerned, those issues are more critical than the computerization argument.

Management wants the unions to promise a continuity of production, so that once an edition is started it will complete its full press run. In addition, it wants a formal dispute procedure to which each side must adhere so production will not be curtailed by the action of a single union over a single grievance.

The system the *Times* group bought from Systems Development Corp. (SDC) is based on four Hewlett-Packard Co. 21MX minicomputers, each with 64K words, and 21 terminal control units.

There are currently 60 CRTs installed — 36 in the training areas and the rest on the central composing floor.

Four Phases

The total system was scheduled to go up in four phases, when — and if — the group comes back into production.

In Phase One, with about 100 CRTs, the copy editors of the supplement would go on-line.

Phase Two would see the *Sunday Times* and *The Times* ads going on-line and the number of CRTs increasing to about 200. That phase was scheduled to be completed by 1980.

Phase Three would have editorial members, first of the *Sunday Times* and then of *The Times*, directly input their copy. All copy editors would also go on-line. That phase was scheduled for 1980 completion.

Phase Four, slated for completion in 1981, would put reporters on-line. That is the front-end phase and would involve first the supplements and then the main papers. It was scheduled for completion by the end of 1981.

The central composing room would continue to exist to handle outside copy, but it was hoped that eventually advertising agency copy would be handled tape-to-tape. However, this has not been finalized.

SDC is known to have had many problems in trying to configure the system to *Times* standards. The group's papers have been consistent winners of design awards, and *The Sunday Times* is particularly fussy.

There have been problems over provisions for accents, makeup flexibility and the like, and currently probably as much as three-fourths of what the group expected, according to internal sources, is running behind schedule.

However, parts are up and running — not operationally but for training. Some union members have reportedly asked if they could use the period of suspension, for which they are receiving full pay for at least the first few weeks, to train on the new equipment.

Meanwhile, *The Times* is like the favorite clue of its tough and notorious crossword editor. A word of seven letters with no clue at all.

The solution? "Missing."

British Institution

Special to CW

LONDON — *The Times*, which suspended publication here recently in a dispute over computerization, is a remarkably durable institution.

Begun on the 1st of January in 1785, it published daily editions without a break until March 26, 1955, when it was first shut down by a maintenance engineers strike that caused a total halt in British publishing.

Even the massive general strike of 1926 in England had not stopped *The Times* from printing.

Famed for its crossword puzzles and letters column, *The Times* has always been the "paper of record" for the British establishment, although it has in recent times been far outshadowed in circulation.

The Times owes its real rise to eminence to the Crimean War of 1853 to 1856, when its circulation reached more than 40,000, which was massive for that era. The cause of that eminence was its correspondent in the Crimea, William Russell, who could be considered the Tom Wolfe of his day.

It was Russell who gave Britain the first interviews in recognizably modern form, using techniques he had to invent. It was also from Russell that Britain got descriptive portraits of life, in his case, the life of the army in the field.

The Times earned its nickname, "the Thunderer," in that period because the impact of those reports from the field was as great on the British at-home population as was that of modern television reporting from Vietnam on Americans.

IBM Office in Italy Damaged by Bomb

BOLOGNA, Italy — A bomb exploded recently outside IBM's downtown Bologna office, causing minor property damage but no casualties.

No warning was given, according to an IBM spokesman. The bomb was placed against the outer wall of the building, causing about $3,000 damage.

Police have no clues about who placed the explosive, the first to hit this office, the spokesman said. An investigation is under way.

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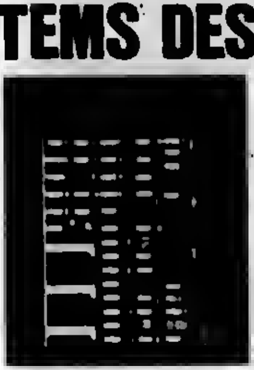

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Computer *Engineering: A DEC View of Hardware Systems Design* by C. Gordon Bell, J. Craig Mudge, and John E. McNamara is the story of hardware systems design practiced at Digital Equipment Corporation over the past 20 years.

Computer *Engineering* is written for people who want to or must understand the evolution of hardware systems design. The focus of the engineer and student of design will be primarily on the highly technical discussions, while that of the manager/planner will be more on the economic and marketplace issues.

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Newman: Misuse of English Not Totally Fault of DPers

(Continued from Page 1)

puterese," Newman finds DP jargon less objectionable when it comes from industry professionals than when it's practiced by outsiders. "I'm disturbed by the avidity with which some laymen adopt computer language when it's not necessary," he complained. "So, in one sense, [the technical terms used by computer people] should be resisted."

Newman offered his observations about language use and misuse in the computer industry shortly after delivering a brief address entitled "Preserving a Civil Tongue." Before a nationwide gathering of Wang Systems users, the newsman confessed some discomfort with the term "word processing" because, he explained, "I've always believed words should be spoken and written, not processed."

Otherwise, he said, he sees nothing "farfetched" in speaking to a group of computer users about the frightful state of American English. "There are no inappropriate forums" from which to attack the "dull, mushy, boneless, gassy" language that pollutes much of contemporary speech and writing, he insisted.

Important to Everyone

Contrary to popular belief, clear and concise communication is important to everyone, regardless of one's occupation. Despite the rapid growth of television and other electronic media, language remains the principal means of formulating and exchanging ideas, and failure to communicate effectively usually signifies an inability to think clearly, Newman said.

Moreover, he added, hazy communication wastes time and labor, creates confusion and results in surplus paperwork, the bane of business.

Unfortunately, many Americans seem irresistibly drawn to pompous, unnecessarily convoluted language either because they think it makes ordinary thought sound more impressive or because it obscures otherwise glaring gaps in their reasoning.

Sample Misusages

In last week's address, as in *Strictly Speaking* — probably his best known plea for linguistic common sense — Newman supported his observations with sample misusages drawn from nearly every major walk of professional life including government, education, business and the news media.

Newman reserved some of his sternest criticisms for the nation's educators, whom he said almost never use simple, straightforward language when they can find a more recondite substitute. In the gobbledygook of contemporary education, students no longer attend school; they become "involved in the educational process," he said.

Once enrolled in classes, students prepare for "performance evaluations" (tests) by consulting "bibliographies of books" where they no doubt find a few texts of "easy difficulty" and perhaps even some suggestions for "recreatory reading."

In business, executives stress the importance of the "decisioning act," exhort more "labor force participation (work) from their employees and extol the virtues of a "high personal autonomy quotient" (self-reliance). No business seems immune from the impulse to inflate or distort language, not even the companies that sell "ice cream transfer spades" (ice cream scoops), "Sealy sleep systems" (beds) or furniture made of "man-made vinyl."

Business, like government, has turned "izing" — the coining of formidable nonsense words ending in "ize" into a new national pastime, Newman reported. Executives now "cognitize" business strategies, "officialize" corporate policy and pay "permanentized" taxes.

Of course, only potato chip makers can "crispenize" their products.

Williams Found Guilty

LOS ANGELES — Barbara Jean Williams has been found guilty in Los Angeles Superior Court on charges of welfare fraud and perjury for what was termed the biggest welfare fraud uncovered in the U.S. to date.

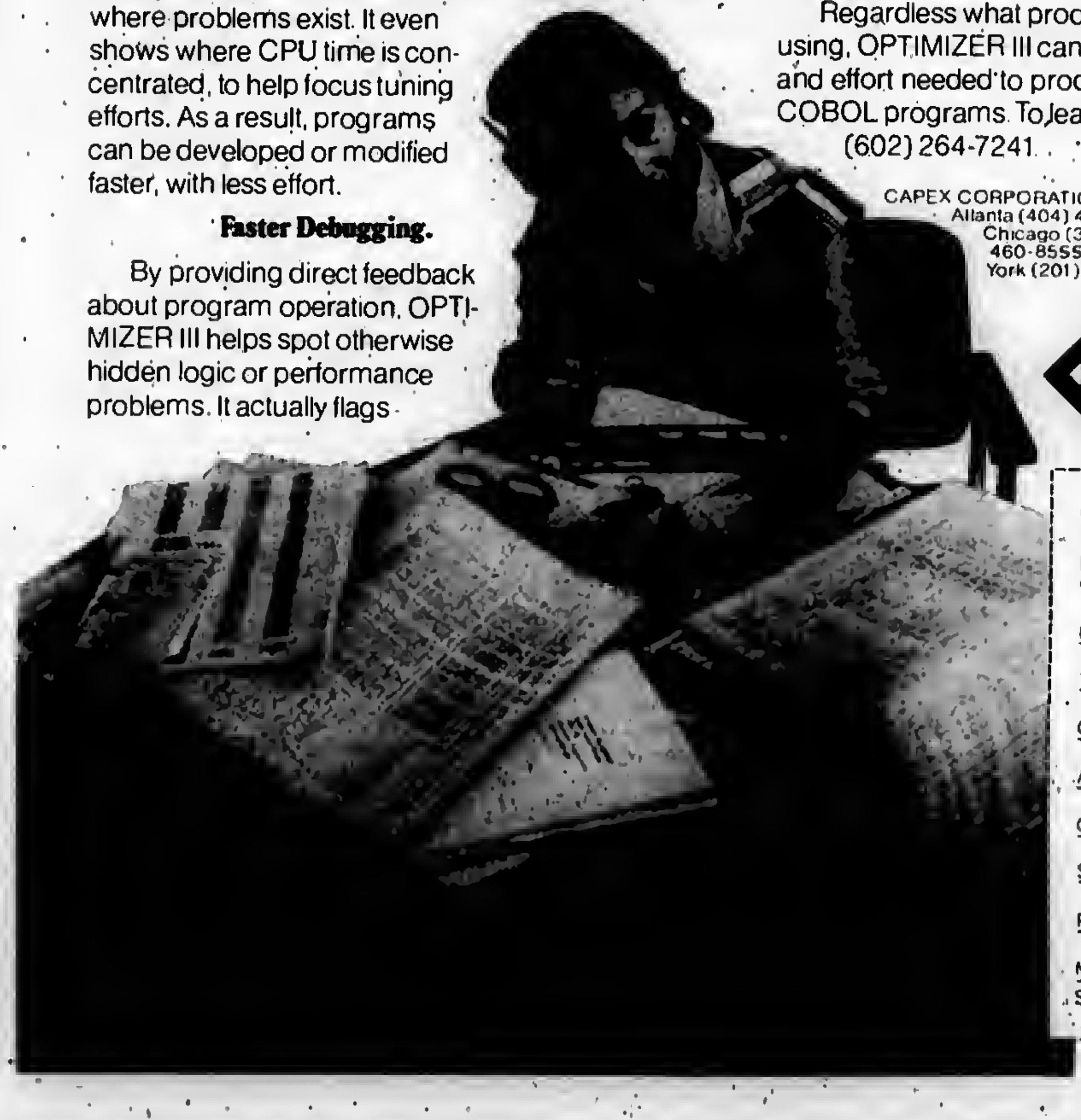
Williams bilked Los Angeles County out of $240,000 by using eight fictitious names and collecting welfare payments for more than 70 children - only four of whom were actually hers. She managed to cheat the system for seven years by fabricating drivers' licenses and birth certificates that looked legitimate to welfare case workers.

Williams succeeded with the scheme until a routine computer match hit on a duplicate address [CW, June 18].

In order to avoid a recurrence of the rip-off, the department has tightened up verification procedures. The birth document of one child in every welfare case will be verified by a staff member to determine the document's legitimacy.

The 33-year-old Williams drove to her trial each day in a silver Cadillac. Superior Court Judge Kenneth Gale heard her case without the presence of a jury, a procedure which Williams had requested.

Williams was found guilty of 10 counts of welfare fraud and 12 counts of perjury. She faces up to eight years in prison. Currently free on $50,000 bail, she is scheduled to be sentenced on Dec. 28.



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IBM Price Cuts Seen Presaging System Debuts

(Continued from Page 1)

prices ranging from $70,000 to $85,000, according to Harry Edelson of Drexel Burnham Lambert, Inc..

The 10% difference in the reduction of purchase over lease prices indicate IBM is trying to motivate users to purchase its systems, several analysts said, pointing out this often presages system introductions.

Most IBM watchers now feel IBM is going to announce at least three members of its E series of computers in January, with the three processors going under the name of AIM (for Aztec, Inca and Maya) internally.

With the purchase price reductions in memory, the firm may be able to spark some users in the under-138 class to purchase systems, the analysts said, and therefore won't have to replace rental machines with the new series.

Furthermore, the incentive to purchase may also keep the purchase level high on the 30 series of processors, clearing the way for the H series of larger systems expected at the end of 1979 or early 1980.

While many analysts see the price cuts as "competitive" against IBM's plug-compatible competitors, those competitors were apparently not caught by surprise.

Amdahl Corp., which markets memory for $85,000 per 1M byte, said it probably will not reduce its memory price because the reduction would "not be that significant in terms of the cost of the whole system."

On the other hand, Itel Corp., which has followed IBM's price of $110,000 per 1M byte rather consistently, reacted immediately by dropping its prices to $75,000 per 1M byte.

"The price reduction by IBM was not as aggressive as we had expected," a spokeswoman said, adding that "we have announced and are now shipping a 16K-bit chip for memory, so IBM is now catching up to us [in technology]."

Reactions to the move by other memory vendors and leasing companies were varied.

Kent Mueller, product marketing manager with the Commercial Systems Division of Intel Corp., said the announcement was not a total surprise to that company.

"We had anticipated a price reduction, but thought it would come during the first quarter of 1979. Some of our price reductions anticipated IBM's action, and we are evaluating the scope of the announcements.

"The differential in the price cuts — 20% on lease/rental, as opposed to 30% on purchase — obviously means IBM is encouraging users to buy, rather than lease," he added. "This may be in anticipation of IBM's Series H."

A spokesman for Ampex Corp. in El Segundo, Calif., said that company will hold the line on its prices "at this time." He noted, however, that Ampex's prices are below IBM's.

Richard Egan, executive vice-president of Cambridge Memories, Inc. of Waltham, Mass., echoed the Ampex spokesman, stating that the company is looking at the possibility of price reductions, but has not yet made any decisions.

"It will really be a matter of what the competition does," he said. "If history repeats itself, there probably will be a price reduction." He predicted the net effect of IBM price cuts on the industry will probably be to "quicken the pace of business, because [users] will no longer be sitting and waiting for IBM to do something."

From the time of the 3033's introduction until last week, IBM limited its users to a maximum of 8M bytes of IBM-supplied memory. Several IBM watchers have commented that the reason for this was IBM's surprise at the volume of orders for the system, which strained the company's production facilities.

With the doubling of the chips' density, IBM has effectively doubled its production capacity, according to Paul Raynault, vice-president of Computer Finders, Inc. of Hackensack, N.J.

The new price for the 12M-byte version of the 3033 will be $3,703,000, while the 16M-byte version will go for $4,003,000. Four-year lease agreements will cost users $87,010/mo for the 12M-byte model or $98,090/mo for the 16K-byte version, while monthly rentals will be $95,650 or $107,810, respectively.

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Privacy Initiative Readied

(Continued from Page 1)

said.

Although a final decision has not been reached, most sources indicated the White House is unlikely to adopt the No. 1 recommendation of the commission. That recommendation calls on the President and Congress to "establish an independent entity" charged with monitoring and evaluating legislation concerning personal privacy.

"The bureaucratic infighting" over this proposed agency has been "fierce," one source close to the proposals indicated. The administration is moving toward deregulation in a number of other areas, he pointed out, and therefore does not look kindly on proposals for new regulatory agencies.

This does not mean, however, that responsibility for such monitoring will not be assigned to some other agency, the sources said. They indicated both the NTIA and the Justice Department's new Office of Information Policy are in the running for the Administration's blessing as the central contact point for overseeing compliance with present and proposed regulations.

'Big Blue' Very Specific

Presently in at least its sixth draft, the 207-page initiative — known internally as "Big Blue" — will suggest legislation in several areas, following the U.S. tradition of specific legislation for specific types of data as opposed to the European omnibus approach to privacy legislation, according to the sources.

Under the proposals, individuals will reportedly be able to retain a greater degree of "ownership" over data being kept about them by medical, credit and insurance organizations. They would be given the right to see such data and correct misleading or erroneous information.

Presently, an individual is notified if credit rating information is used as the basis of an adverse credit recommendation about him. The individual then has the right to request and correct such information. Under the new proposals, when an individual applies for credit, the credit grantor would have to notify the individual of the types of information it expects to collect from third parties.

The proposals, which would be added to the Fair Credit Reporting Act, would also allow an individual access to credit information about him and permit the individual to correct the records.

Curbs on Insurers

In addition, the Fair Credit Reporting Act would be amended to include insurance companies in certain cases. For example, insurance institutions would be required, upon the request of an individual, to inform the individual if it has any records on him and grant him access to those records, including medical information.

In the area of medical records, the proposals would make medical care providers responsible for keeping records confidential. They would be prohibited from disclosing information without the data subject's permission except to other medical care providers which were consulted in connection with the treatment of the individual or for public health reasons.

An individual would have the right to see information kept about him by different medical care providers either directly or through a medical care professional designated by him.

Another major thrust of the proposals for legislation could concern the access of police agencies to information on individuals in a number of areas. The Administration fought hard for the Rights to Financial Privacy Act of 1978, which severely limits the amount of information police agencies can obtain about an individual from banks and other financial institutions without a warrant or subpoena.

Some sources feel the Administration may try to further limit the type of information police agencies may request from insurance companies and credit grantors, among others, in its initiative.

However, the departments of Treasury and Justice are reportedly having trouble with this part of the initiative and have been seeking changes in the proposal's wording.

The sources noted last week that the final outlines of the privacy initiative will not be fully known until the President has reviewed the working papers, which should be on his desk by now. If the President decides to proceed with the initiative, the legislative program to implement it would be submitted to Congress when it convenes next year — by February at the latest.

Former Ford President on Stand

Character Witness Lauds IBM's Management

By Connie Winkler
CW Staff

NEW YORK — IBM got rave reviews from its first character witness in the U.S. vs. IBM antitrust trial here. The witness was Arjay Miller, dean of the Stanford University Graduate School of Business and former president of Ford Motor Co.

"IBM is an exceptionally well managed company and the excellence of IBM's management is one of the principal reasons for its success as a corporation," Miller told the court during two days of testimony last week. When pressed during cross-examination, however, Miller said he had no opinion whether IBM or Ford was better managed during his period as president, form 1963 to 1968.

Miller, who is on the boards of six major companies, was one of the "whiz kids", 10 Army Air Force officers including former Secretary of Defense Robert McNamara who went to Ford as a group after World War II and rose quickly through the ranks.

Miller agreed with Justice Department counsel that Xerox Corp., General Electric Co. and most of the top 100 firms of the Fortune 500 are also well managed, but he singled out IBM as "exceptional." Miller said he based his opinion on recent talks with six of IBM's top nine executives, his acquaintance with IBM directors and Chairman Frank T. Cary, IBM's profitability and the 124 Stanford MBAs IBM has hired — including Cary.

IBM apparently called Miller to counter testimony by government witnesses that IBM was not well managed and not a good corporate citizen because it engaged in monopolistic practices. The Justice Department attacked Miller's opinions by showing they were based on personal associations and were formed prior to his deposition in this case, when he had only general information about the company.

Talent Scarcest Resource

Much of Miller's testimony was a general discussion of how his own management theories parallel IBM's. "The single most important difference among companies is people," he said, and the scarcest resource in government and business is management talent — people who have the ability to get things done by effectively using limited resources.

(Continued on Page 10)

Blown Fuse Halts Input of Data At Logan Airport

By Marcy Rosenberg
CW Staff

BOSTON — A sudden power loss kicked out Logan Airport's radar system here recently, cutting off the input of air traffic data to the airport's mainframe for about one hour.

Radar scanners supply the computer — a modified Univac 1230 used to store and retrieve air traffic information — with such data as flight names and numbers, altitudes and speeds for incoming and outgoing planes, according to Ray Zazzetti, deputy chief at Logan's control tower.

Although the Univac system "functioned normally" during the power outage, "there was nothing to feed data to the computer" because the radar was down, Zazzetti explained.

A blown fuse in the radar system caused the loss of power in the tower cab and in the radar room where the air traffic controllers work, according to a spokesman for Massport, the state agency that governs the airport. The radar went down between 4:45 p.m. and 5:45 p.m., the spokesman said, noting peak air traffic hours are from 4 p.m. to 7 p.m.

During that hour, the airport subbed in a "hand-carried, hand-manipulated slotting system" to compile and retrieve the data normally supplied by the computer. The manual retrieval system "gets information on aircraft separation based on standards established in terms of time and altitude," Zazzetti said.

While Logan never lost contact with its aircraft, the loss of radar caused 20-minute to 40-minute flight delays for two hours after the system went out, and "it took us three additional hours to make up for the lost time," the Massport spokesman said.

When the radar power failed, 25 to 35 planes were scheduled to take off, and the same number was set to land. "We held all take-offs, but managed to bring in seven to eight planes. Normally we can bring in triple that number in that time," the spokesman noted.

Asked why it took so long to trace the problem, the spokesman said the fuse "was in a remote part of a rather sophisticated circuitry system."

The radar system, he added, does not have a stand-by generator for every fuse, but rather works on a three-phase generator that kicks in only when all three phases go down. The blown fuse, affecting only one phase, didn't cause enough of an outage to activate the generator, but was sufficient to render the equipment inoperable.

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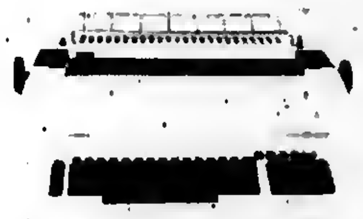

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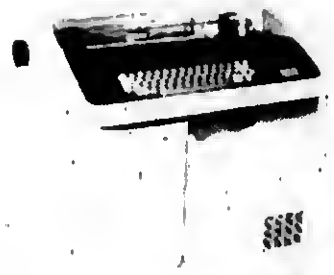

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Cheeky Answer Systems Seen Vital

By Brad Schultz
CW Staff

WASHINGTON, D.C. — Computerized question-answering systems (QAS) should be "impertinent."

In the sense used by Prof. Laurent Siklossy at a technical session of the 1978 Association for Computing Machinery (ACM) convention here last week, a QAS is impertinent if it tells a user something he did not ask.

A sophisticated QAS *must* be impertinent, providing the user with unsolicited information as well as answering questions. The extra information should be relevant and help the user achieve his goals, the University of Texas computer scientist explained.

Impertinent QAS can minimize the "all too oft-repeated reaction to present-day QAS: 'Why didn't you tell me?' To which the QAS answers, 'Well, you didn't ask.' "

Customer Duped

Siklossy recently collaborated on the design and implementation of an airline tariff QAS developed to field airline customer queries about travel through Europe, North Africa and the Middle East. Drawing from this experience, he illustrated the need for impertinent QAS with a sample dialogue between a hypothetical customer and the system.

The dialogue began with the user declaring his desire to travel by air from Chicago to London and then back to Chicago. The QAS responded by asking when the user wished to depart and when he wished to return home.

The user specified these dates and was then asked, "Will you fly first class?" He replied, "No, economy" and was next informed of a suitable itinerary, including flight numbers, arrival and departure times and the name of the carrier.

Next the user asked the price of the ticket; the system noted the amount. The dialogue ended with the user acknowledging acceptance of the terms.

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But the user was "had" by this interaction, Siklossy told the session. Because the user never inquired about certain available discounts, he learned of them too late, from fellow travelers. On his return, the user asked the QAS why it had not informed him of these opportunities. "You didn't ask," the system responded.

Siklossy noted that in this example the QAS answered all questions put to it, yet proved inadequate in helping the user attain his objective (to make a journey within certain constraints of time and money). The problem arose from the user's limited knowledge.

Subject Focusing

To avert such a problem, the QAS user interaction must feature a "subject-focusing phase," Siklossy continued. Basically, subject focusing is a procedure by which the user's interests within the "topic space" are made explicit to the system.

Gradually, the user's declared concerns are sharpened through dialogue with the QAS. Wherever possible, values are assigned to the "dimensions" of the topic space.

For example, the dimensions of a trip might include the departure and return times, the coordinates of points visited, the ticket prices, the identity of carriers and the weather and political conditions of the places to be visited.

At some point in the subject-focusing phase, both user and system agree on a "question space," Siklossy said. Beyond this point, true questions can be asked by the user, with answers supplied by the system.

But focusing can lead to "dead ends." For example, the user could state a desire to leave Chicago on the morning of June 1 despite an absence of June 1 morning flights.

Furthermore, certain dimensions may not be assigned values — as when the system does not "think" to ask the user what type of dinner he wishes. In such cases, the system may follow a policy of defaulting to a "normal" value.

For example, if the user does not specify a vegetarian dinner, the system might assume that a dinner featuring meat would be satisfactory.

Situation-Dependent Matter

In general, a QAS should be impertinent if some slight modification of the initial user query results in some very beneficial change of the answer associated with that query, Siklossy oberved. Conversely, there is no point in sharpening a query to produce an answer of little or no value, such as a truism.

According to Siklossy, unless the designers of question-answering data base management systems make allowance for what he called the "discontinuity" of the world, QAS will mislead users by failing to mention certain things.

Two Examples

For instance, the user could ask the system how many employees of a given firm earn more than $30,000 per year and be told "36" without being informed that all 36 employees earned far more than $30,000.

In another situation, the user might ask which companies supply all parts used by a given department and be told, "companies ABC and DEF." He would not be told that DEF supplied only one part and that all other parts come from ABC.

Data base management research should not be limited to the external organization of data, such as categorical hierarchies, Siklossy told the session.

The useful QAS must do more than understand what has been asked, he concluded; it must understand what has *not* been asked.

IBM Managers Lauded at Trial

(Continued from Page 9)

"The ability to attract and use management talent is the principal difference between successful and unsuccessful companies," Miller added. He also stressed the need for companies to be good corporate citizens by, for example, hiring handicapped people, minorities and women.

He talked specifically about Ford's acquisition of Philco in the 1960s. The acquisition was aimed at getting Ford into the lucrative space and defense business and not at getting Philco out of the comuter business, thus eliminating an IBM competitor, Miller said.

Miller's testimony complemented that of the previous witness, Thomas M. Liptak, president of IBM's General Technology Division (GTD), which manufactures memory and logic components, including the 64K chip in the recently introduced IBM 8100. GTD is operating at capacity producing those chips, Liptak said.

Liptak spoke generally about IBM's operations, including management's contention systems and checks and balances within the corporation. Liptak's testimony was unusual in this trial, noted for its lengthy testimony, because it took only one day.

Both Liptak's and Miller's testimonies were accelerated because the direct part (questions by IBM counsel) was submitted in a written statement. The narrative technique was encouraged by Judge David N. Edelstein to speed the trial, now in its fourth year.

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Out of 'No Man's Land'

Panel Agrees Congress Has Entered the DP Age

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — In the course of a few short years the U.S. Congress has emerged from a DP "no man's land" to become a full-fledged member of the information age.

But all that progress has not come easily. Members of a panel at the Association for Computing Machinery's (ACM) annual meeting last week described the process of congressional automation as "a series of ups and downs" and "a steeplechase course."

However, "in spite of all the frustration and occasional disappointments, we have been able to move ahead," according to Robert L. Chartrand of the Library of Congress Congressional Research Service (CRS).

"A dozen years ago there was precious little activity on Capitol Hill regarding computers," Chartrand said. Most members of Congress took a "wait-and-see" attitude about DP at that time, he added.

The breakthrough came in 1970 — during what he called the "dim years" — when CRS contacted more than 100 senators and representatives and more than 150 staff members to determine possible uses of automation.

In 1970 slightly less than $5 million was spent by Congress on computer-related services. Today the figure is eight times as much. During the intervening years, Chartrand said, Congress has made a commitment to use information technology in order to improve its decision-making process.

Another panel member, John K. Swearingen, director of information systems of the Senate Committee on Rules and Administration Technology Services, noted that while five years ago there were no computer terminals and only "one small computer" in use in the Senate, there are now terminals in every senator's office and the Senate is supported by two IBM 370s.

Example of Progress

CRS, which provides most Congress' DP support, is an example of how far automation has come on Capitol Hill. CRS maintains several large data bases with on-line connections to hundreds of terminals, runs a DP operation that includes two Amdahl Corp. 12M-byte 470/V5s and has a library of more than 5,000 computer tapes and 12G bytes of disk storage.

Congress now employs several hundred DP support staff, the panelists noted, and is moving rapidly into advanced technology. Chartrand cited expanded use of video and cassette technology and experimentation with teleconferencing via satellite as indications of the directions in which Congress is moving.

Boyd L. Alexander, director of information systems in the U.S. House of Representatives, told the panel audience that micrographics will be used in the Legislature's daily operation. The Senate receives about one million letters every month addressed to individual senators, a figure that can easily double or triple in any given month.

That volume of correspondence, Swearingen said, supports the move toward word processing, where "we've really only scratched the surface."

A similar trend is noticeable on the House side, according to Alexander. "The IBM system 6 is particularly popular on the Hill," he added.

"Basically, we see distributed DP as the way we're moving." Soon, he predicted, congressional committees will have their own minicomputers and microcomputers, and they will only tie into the House mainframes to access the congressional data bases and for special projects.

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At ACM

Alexander also predicted an increased use of computer graphics, especially by the committees, and more use of advanced communications. Congressmen have a real need for better contact with their district offices, and direct voice and digital communications links will be established for that purpose, he explained.

Congress now has the staff, facilities and services to provide timely information that is as accurate and complete as possible, according to CRS' Chartrand.

One sign of that progress, he added, is that Congress, now more familiar with information technology, is showing more concern for the issues that technology raises and is embodying that concern in legislation.

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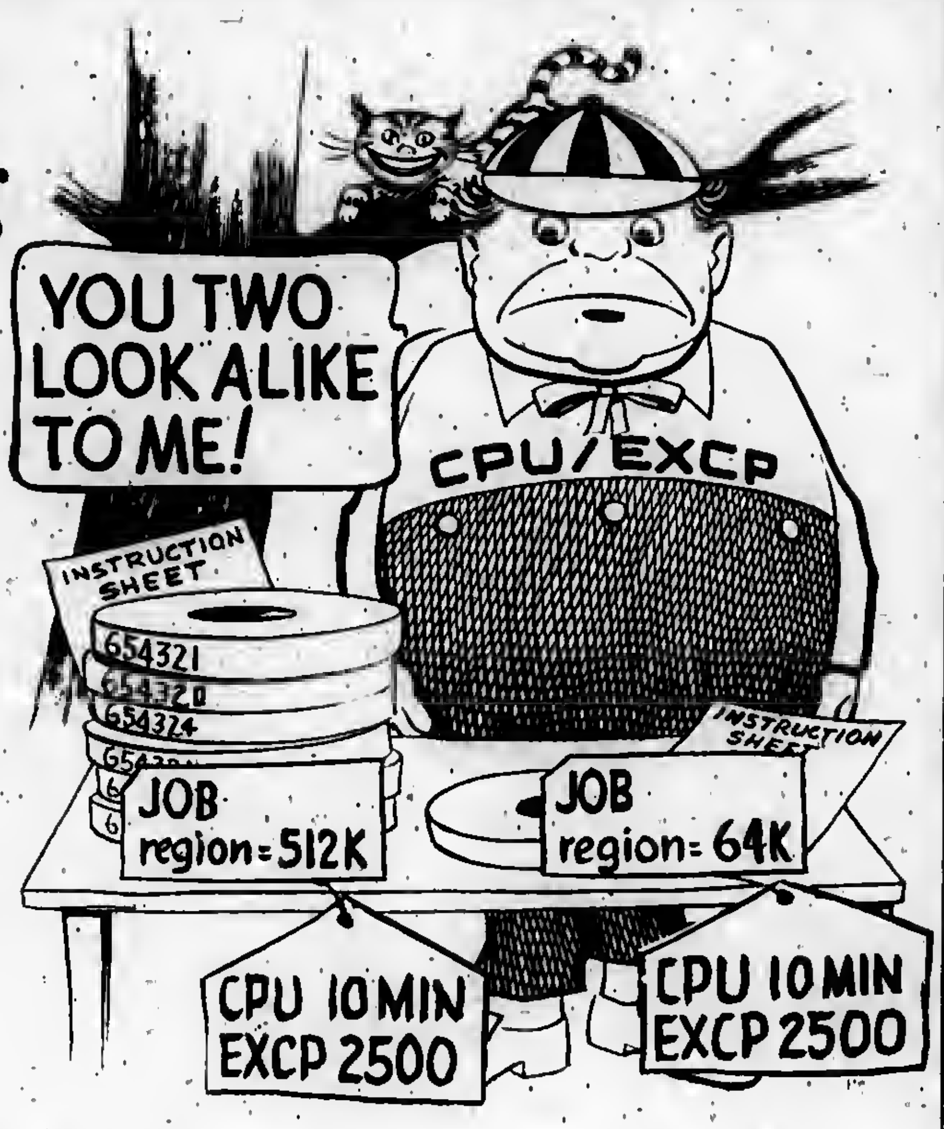

Knowledge is power
(Francis Bacon)

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Carter Administration Favoring Deregulation

By **Jake Kirchner**
CW Washington Bureau

WASHINGTON, D.C. – The Carter Administration is committed to a policy of increasing industrial efficiency and innovation through deregulation, and this policy will be applied to the industry being created by the nexus of computer and communications technologies, according to one Administration official.

Rather than regulating that industry, the Administration wants to clarify the principles needed to develop information policy, according to Paul I. Bortz, deputy assistant secretary for the National Telecommunications and Information Administration (NTIA).

Addressing a session of the annual conference of the Association for Computing Machinery (ACM) held here last week, Bortz said that in the years ahead "we can expect development of many policies which affect information applications and industries," but the industries are too diverse to ever lend themselves to one "single, comprehensive information policy."

One example of the principles to be clarified is that of "fair information practices," which he defined as "assuring individual rights with respect to institutional recordkeeping practices and restricting governmental access to records."

Another example is "market structure and regulatory policy." He called continued competition in providing information services "a desirable goal" and one to which NTIA, the primary advisor to the President on information policy, is committed.

Overlapping Industries

"Where there is overlap between regulated industries such as the computer and information services sector," NTIA espouses "fair and consistent policy" that is based on some deregulation of the regulated industries rather than the regulation of currently unregulated sectors.

In accordance with this view, Bortz said, NTIA will seek "full deregulation of the terminal equipment market."

Explaining NTIA thoughts in this area, Bortz maintained, "The patches being added to the regulatory framework" – such as those added to the Communications Act of 1934 by the first Federal Communications Commission Computer Inquiry in 1971 – do not last very long "in the face of rapid innovation."

Other developments in the "overlap industry" of computers and communications that pose "basic regulatory problems" are, according to Bortz, the Satellite Business Systems (SBS) venture and Xerox Corp.'s recently announced Xerox Telecommunications Network [CW, Nov. 20].

Both activities, he said, "mark the further entry of information-based activities into communications services." That entry is "natural given the technology," but it does raise "fundamental questions as to the future regulation of common carrier telecommunications," he noted.

"This is a big game; billions of dollars are at stake. Even the viability of major corporations at the end of this century will be affected by legislative and regulatory decisions that will be made over the next several years," he emphasized.

Another consideration in policymaking in this area, Bortz said, is fear on the part of the public: "fear of the unknown, fear of job displacement, fear of surveillance, fear of dehumanization."

CW
At ACM

Those fears should not be dismissed out of hand. "The emotional element in policymaking must not be underrated"; there are real threats in the advances in information technology, he stated.

NTIA is currently analyzing the "issues pertinent to the current Computer Inquiry," and the agency's position on one facet of that inquiry is that the terminal equipment industry should be deregulated, Bortz remarked.

Deregulation of that market "will further stimulate the already rapid development of equipment options" that have occurred since the "landmark Carterfone decision," he said. NTIA also believes AT&T must be able to participate in that market and that AT&T's participation should be allowed in a way "to ensure competition that is fair to all parties."

NTIA has yet to propose specific recommendations for such deregulation, Bortz said, but believes a deregulated terminal market "can flourish" consistent with "both the spirit and the letter of the 1956 Consent Decree." NTIA is also studying AT&T's proposed Advanced Communications Service and the Postal Service's entry into electronic mail.

Some of the other "key issues" being studied, he said, are:

- The appropriate ways to handle information about individuals.
- The steps to be taken to "open access to and encourage maximum dissemination of information."
- How to encourage "the production of information goods and services."
- How to arrange for the "equitable distribution" of communications and information goods and services.
- The market structure of information industries.
- The problem of information and foreign relations.

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ICS Filing Asks $3.5 Million

HP Asks Court to Throw Out User's Lawsuit

By Brad Schultz
CW Staff

NEWPORT NEWS, Va. — Hewlett-Packard Co. has moved for the dismissal of a $3.5 million damage suit filed against it in U.S. district court here by a former customer, Investment Counseling Services, Inc. (ICS).

The medical billing service bureau has chargd HP with fraud and misrepresentation, breach of contract and negligence and malpractice for its role in upgrading the firm's DP facilities. The formal complaint, filed last August, said HP "knew or should have known of certain material deficiencies and inadequacies in the equipment and software" it delivered [CW, Sept. 4].

Debate on the substance of the complaint must now wait until the dismissal motion is deliberated. The dismissal motion argues that ICS did not file the document promptly enough, nor express it in language clear enough, to comply with U.S. and Virginia law and civil procedure rules.

Finding some of the complaint's terms and phrases "redundant, immaterial and/or impertinent," HP asked the federal court to strike this language from the document or direct that it be rephrased in greater detail.

State Action, Too

The vendor also asked the court to delay its proceedings until a parallel action in Newport News Circuit Court is resolved. That motion seems unlikely to be granted, however, since ICS now intends to prosecute only the federal action, according to the firm's counsel, Thomas K. Christo of Boston.

The federal court suit was filed almost a full year after the state proceedings began, Christo noted. The latter was solely addressed to the breach of contract issue and cannot by itself result in full satisfaction of his client's demands, he said.

The federal suit supersedes the state action, he indicated. Moreover, both parties have acknowledged that simultaneous prosecution would be an expensive duplication of effort.

HP's motion to dismiss the ICS suit argued that the first count of ICS' complaint — fraud and misrepresentation — is nullified by Virginia's statute of limitations on personal litigation. Where applicable, the statute invalidates the suit of an injured party if it was filed more than one year after the alleged injury.

The motion also charged ICS with violating the Federal Rules of Civil Procedure by insufficiently detailing its allegations on all three counts, preventing HP from framing a proper response.

In a brief filed with the U.S. court, Christo countered that the statute of limitations does not apply to the suit against HP and indicated that ICS could not have violated the statute even if it did apply.

According to the brief, ICS did not attempt "full utilization" of the system until January 1977 — although it was delivered in September 1976 — and was unable to properly evaluate the system's performance during the period between January and August 1977. Under constraint of the statute of limitations, if ICS had concluded during this period that misrepresentation had occurred, then the statute would have lapsed by the time the complaint was filed.

The system's hardware and software components were allegedly not "up and working" together during this period, preventing a comparison of benchmarks with contract specifications, the brief explained.

"At least" until the time ICS launched its federal court action, "problems continued to occur, and HP continued to make attempts at repair, including sending at least one unqualified expert to examine and evaluate the computer system and to recommend corrective measures," the ICS brief claimed.

Hence, Christo argued, the statute of limitations could not have lapsed in this matter — if applicable, which he disputes.

Christo called "patently absurd" HP's contention that the complaint was insufficiently detailed. The vendor protested in its motion for dismissal that the second count — breach of contract — was phrased in a fashion "so vague and ambiguous that it does not state a cause of action."

The document failed to define the hardware, software or services alleged to be faulty, HP protested. In an attached "Motion for a More Definite Statement," the vendor asked that these items be specified.

However, the complaint did characterize HP's MPE time-sharing system, data entry library and Image software

(Continued on Page 14)

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ABA Forms Unit on DP-Related Legal Issues

WASHINGTON, D.C. — Ever-increasing dependence on computer systems in the business environment has generated growing concern about the issue of negligence as it relates to the DP community. To address this concern, the American Bar Association (ABA) has formed a Subcommittee on Professionalism and Malpractice of Computer Specialists.

The subcommittee will be chaired by Jay T. Westermeier, an attorney with the law firm of Arent, Fox, Kintner, Plotkin & Kahn here.

Part of ABA's Science and Technology Section Committee on Law Relating to Computers, the subcommittee will examine such issues as the certification and licensing of data processors; standards for determining negligent system analysis, design, implementation and management; improper reliance on computer systems; and malpractice insurance.

Certifying DP professionals may be one way to deal with public concern over computer theft, a concern sparked by "the advent of electronic funds transfer [EFT]," Westermeier said.

"We assume the cost and savings benefits of EFT systems will be so compelling" that these systems will be on the scene for a long time to come "and fraud like [Stanley] Rifkin's $10 million [CW, Nov. 13] will be inevitable. One possible solution may be to limit access of individuals to computer systems through licensing or certification," he suggested.

Another issue, Westermeier said, is to determine the degree of user reliance on a computer system or vendor that would call for applying professional malpractice standards — such as those imposed on doctors, lawyers and accountants — to system vendors or DP professionals.

Westermeier cited a case in which Triangle Underwriters, Inc. had trouble with a computer system that Honeywell, Inc. developed, installed and had to repair continually. The court ruled that because the system was a turnkey, Honeywell's continuing repair efforts "did not establish the necessary professional relationship to judge the computer company by professional malpractice standards."

Allied with concern over malpractice standards is the issue of insurance. There have been a number of efforts, Westermeier said, to provide general malpractice coverage to DPers and specific coverage for software vendors.

Dealing With Reliance

About improper reliance on computer systems, he said the subcommittee will look at recent court cases to "educate the DP community" on when management should intervene in an otherwise automated decision-making process "to assure that decisions are not made in an arbitrary computerized mode." One such case, he noted, involved a utility company whose computerized system kept billing a family on two sets of meters.

The subcommittee, comprised of ABA members, plans to make itself available to such organizations as the American Federation of Information Processing Societies, and "we are asking for input from the DP community on some of these issues," Westermeier said.

The ABA, he added, "has an educational function to try to help individuals to better understand the law and their liabilities and rights and to try to alert management to potential legal problems."

HP Asks Court To Dismiss Suit

(Continued from Page 13)

as inefficient and improper for use.

According to the complaint, HP failed to disclose certain flaws in these and other products and misrepresented their performance capabilities. This allegedly caused ICS to purchase goods ill-suited to its needs and forms the basis of the first count.

The second count refers to HP's alleged failure to deliver what was promised and the third count — negligence and malpractice — to the vendor's alleged failure "to provide certain services and advice . . . which equaled or exceeded then-prevailing standards . . . within the data processing industry."

The complaint said that an HP representative verbally assured ICS its products would meet the firm's needs; that the hardware proposed was "fully tested and reliable"; that ICS could easily convert its existing software to the new equipment; and that "HP would furnish to ICS everything that was needed for an efficient, reliable on-line system."

ICS has claimed $328,000 in damages on the first count, $2,908,000 on the second and about $421,600 on the third for a total of just less than $3,450,000 "plus interest and costs."

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New Security Measures May Help

ABA Finds Banks Cutting Losses With ATMs

By Ann Dooley
CW Staff

WASHINGTON, D.C. — A large number of banks using automated teller machines (ATM) are very pleased with them overall and have reduced their dollar losses since switching from paper-based systems to ATM-based transaction systems, according to a recent survey by the American Bankers Association (ABA).

Of the more than 134 banks that responded to the ABA's poll, 8.9% indicated they had not experienced any financial losses through ATMs, while 78.6% noted that losses with ATM-based systems were smaller than those they had experienced when using more traditional means of accessing demand-deposit and time-deposit accounts.

Approximately 7% of the responding banks experienced nearly equal losses under both systems while the smallest percentage — 5.4% — reported that losses through ATMs were greater than those under the more traditional transaction methods.

One reason for the reduced losses could be the security methods implemented by the banks with the ATMs, according to the survey. When questiond about their systems' security, 47% reported either no security problems at all or extremely effective security. Forty-three percent indicated only minor problems with ATM security.

Systems Cost-Justified

In addition, 38% believed their systems were cost-justified, while approximately 30% noted their security systems were currently under review. No respondent indicated any major problems with the security aspects of its ATM system.

Most banks responding to the survey claimed that a large percentage of the dollar loss resulted from improper handling of identity cards, either from loss or theft. The survey showed stolen cards accounted for almost two-thirds of dollar losses through ATMs last year.

Approximately 64% of the losses resulted from interception in the mail of the card and/or personal identification number (PIN), loss or theft of the card or other kinds of unauthorized use. Another 22.3% of the dollar losses were attributed to customer fraud, such as use of an ATM after an account was closed or unrecovered overdrafts. Approximately 13% of the losses resulted from internal bank problems such as hardware or software errors or internal fraud, according to the survey.

Liability Limits

Although the loss from the customer's end was high, 62% of the responding banks reported no set liability limit for losses occurring through ATM systems. In most of the banks, the customer absorbed an average of $25 per loss, but in two-thirds of the instances where loss occurred through ATM transactions, the customer suffered no loss, the survey reported.

The remaining 38% had established customer liability limits. Half set $50 as their limit, while the other half "reported their customers had a zero loss exposure."

In those banks with set liability limits, the average customer loss was $13, and in three-quarters of the cases, the bank absorbed the entire loss, the survey results said.

More than half the responding banks indicated that customer liability for loss was determined on a case-by-case basis or determined by customer negligence. Almost one-quarter of the surveyed banks reported the bank absorbed all losses, while nearly 10% indicated either a set dollar limit was used or the customer was responsible for all losses until the card's loss was reported.

Security Devices

To protect customers' funds, the banks employ a variety of security measures. Approximately one-quarter of the respondents indicated a hot-line telephone is provided at the ATM site to report lost or stolen cards, and almost one-fifth of the banks said they use a security camera at the ATM site.

A number of banks use added security measures such as data encryption and separate mailing of the electronic funds transfer (EFT) card and PIN. They also set daily and weekly limits on withdrawal amounts from ATM systems.

One-fourth of the respondents said they allow customers to select their own PINs, but this appeared to be a source of disagreement within the banking community. Some banks contended that customer-selected numbers provide the greatest security, while others believed bank-selected numbers give the best protection.

Those that advocate the bank-selected PIN fear a customer-selected PIN may be easily discovered by a thief from information in the account holder's wallet such as a birthdate or house number.

Many banks gave users more credit for handling cards than they should have, an ABA spokesman said. Banks often found customers writing the PIN on the card itself, loaning the card to a friend or even leaving the card in the machine, he said.

However, those banks that prefer to have customers select their own PINs reported that customer education on preventative measures eliminates most problems. The responding banks pointed out that customers who choose their own numbers are less likely to write them on their EFT cards.

The ABA concluded it was impossible to determine from the survey results whether any kind of relationship exists between additional security measures and dollar losses. The ABA noted that the cause-and-effect relationship could not be determined since the results were unclear as to whether banks had fewer losses because of ATM security or whether they installed the additional measures because of unacceptably high losses.

Rebuttal of 'War Stories'

The ABA mailed the questionnaires in May and June to approximately 225 banks using ATM systems. Sixty percent were returned. The respondents operate about 20% of all ATMs in the U.S., according to the ABA.

The average bank responding to the survey had a system of 14 ATMs with one in 10 off-premise. The average system age was four years, and the mean transaction volume per ATM was 3,760/mo. Two-thirds of the systems had on-line terminals.

Almost half the respondents had deposits exceeding $1 billion and less than 6% had deposits of less than $100 million.

The ABA said it undertook the survey to help rebut the large number of "war stories" reported by the media and discussed in Congress about the security problems inherent in electronic banking systems. The ABA believes these claims are unfounded.

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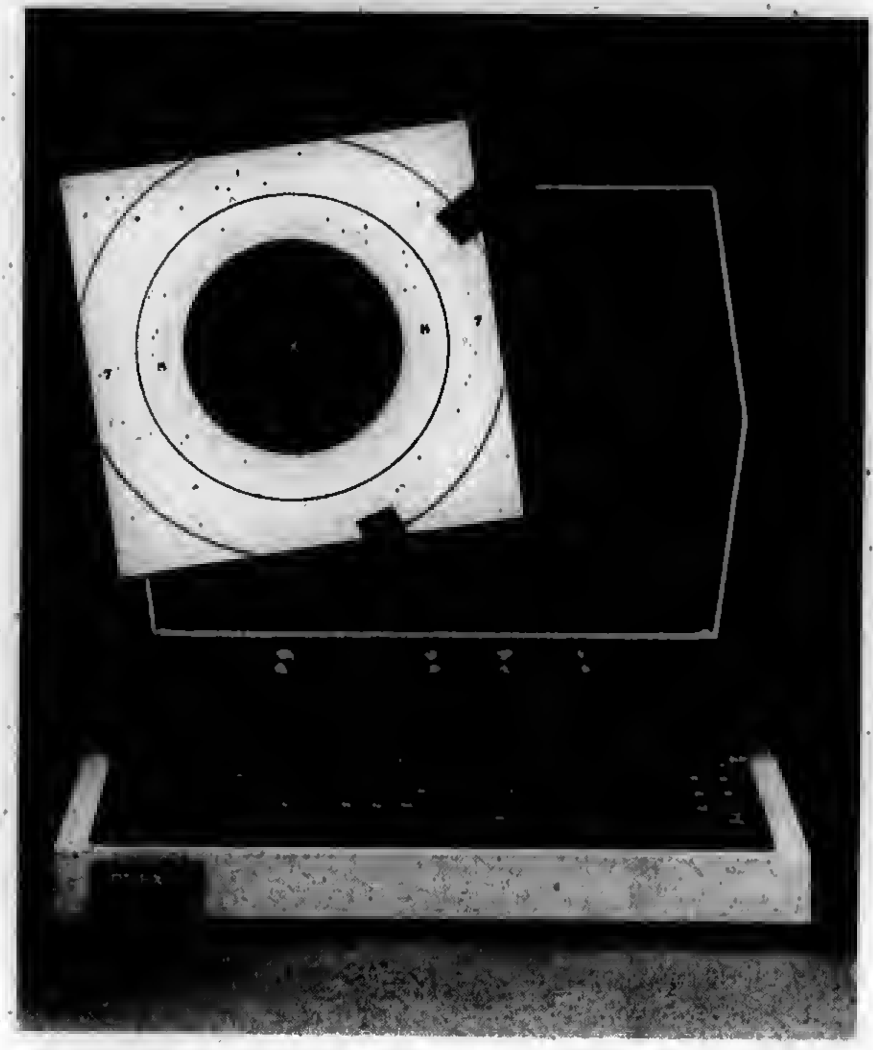

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Notes Net Gain of 13%

Diebold Survey: MIS Spending on the Rise

By Marcy Rosenberg
CW Staff

NEW YORK — Corporate spending for information systems showed a 13% net gain from 1976 to 1977 and is expected to rise an average of 11% yearly during the three-year period from 1977 to 1979.

These were among the findings recently released by the Diebold Group, Inc., a management consulting firm that surveyed some 200 clients for 1977 MIS budget figures and projected spending for fiscal 1978.

Based on 1977 figures, the survey found MIS expenditures exceeded 1.07% of sales in a typical industrial corporation, up from .95% in 1971. That increase, Diebold said, reflects more spending for hardware as well as for MIS personnel.

> *A reverse trend appears to be taking shape . . . with communications becoming more centralized and traditional MIS areas more decentralized because of distributed processing.*

"Hardware budget dollar increases usually mean acquisition of new hardware," according to Joe Ferreira, director of Diebold's research program. "However, while that is taking place, labor costs are also going up as a result of inflation over normal salary increases and new hires.

"With hardware prices coming down, you can buy more capability for fewer dollars," Ferreira added, "but that much more capability is needed today for the applications made possible by advances in computer technology.

"Companies, therefore, end up spending more for increasingly sophisticated equipment and also for more people to make the systems work. The industry has not yet seen significant improvements in personnel productivity to keep up with increasing hardware performance."

DP Out of DP Area

Employees working within MIS departments comprised 1.58% of the total corporate work force in 1977 compared with 1.41% in 1971, Ferreira said.

However, because distributed processing has made it possible, to move some DP functions out of the MIS department budget and into user department budgets, "more and more people will perform DP activities in user areas and will be paid from user budgets," he noted.

In 1977, an additional .22% of all employees in the companies surveyed performed DP-related activities outside the MIS department.

Today, DP employees devote more time to applications work than to redesign and maintenance efforts, according to the survey. Companies are cutting operations personnel budgets an average of 1% per year, from 29% of the total 1971 MIS budget to a current 22%, Diebold found.

New Emphasis

Applications efforts appear to be moving toward distribution — such as inventory shipments — and away from manufacturing — for example, bill of materials processing, the survey found.

Patterns in hardware spending indicated processors and memories remained stable at 43% of the total hardware budget and terminals comprised about 12% while conventional peripherals dropped to 29% and will continue to decline.

In the communications area, Diebold noted a trend to greater convergence of telecommunications and DP systems. About 38% of all firms in the study separated telecommunications from the DP function, but this percentage decreased sharply as corporate size increased.

DP expenditures in many companies "are fairly well centralized with a single group in overall charge of budgets and spending," according to Ferreira. On the other hand, he noted, "telecommunications is far more apt to be distributed widely throughout the corporation with a variety of authorities in charge of different pieces."

Reverse Trend

A reverse trend appears to be taking shape, however, with communications becoming more centralized and traditional MIS areas more decentralized because of distributed processing, Ferreira added.

Spending for communications averaged .52% of corporate revenues while the average communications budget comprised 52% of the MIS budget. Communications budgets rose an average of 10.1% from 1977 to 1978, and Diebold predicted they will increase 9.1% annually over the next five years.

DP opportunities are increasing for independent communications carriers and equipment manufacturers over their current 42% share of the data equipment business, according to the survey.

Corporate Plans

The number of companies which have developed an overall corporate communications plan rose by 7% in two years to 47%, and about 60% of the survey respondents indicated plans to obtain more equipment and transmission services from outside the Bell System.

Concerning specific communications trends, Diebold found 51% of the participating companies have combined voice and data networks and 49% are using special devices to monitor communications routing and costs. The most popular of those monitors is from a company other than Bell.

In-house electronic mail "is still embryonic," the survey noted, but while only 21% of the companies have implemented these systems, 40% of those firms not using them plan to experiment with the technology in the future.

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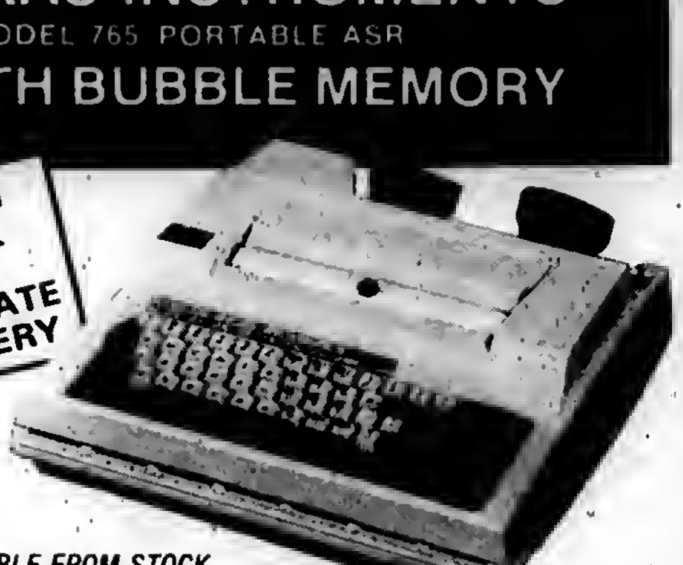

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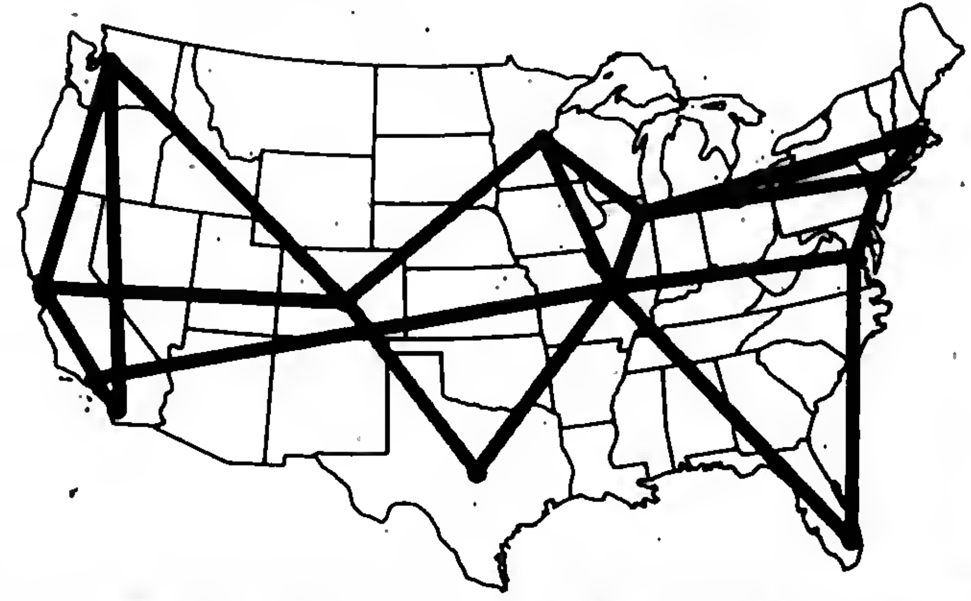
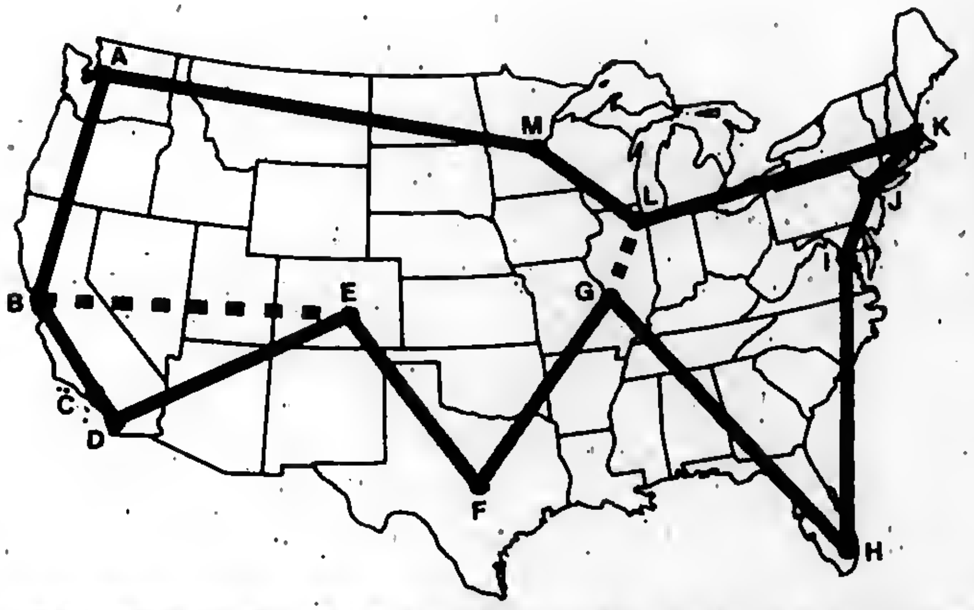
To get rid of a host of problems, get rid of the host.

Having a host system in a network is traditional. Unfortunately, it is also the traditional point of concentrated difficulties. For when the host goes down, so does the whole network. And even if the host is only suffering an intermittent difficulty, the integrity of the data base is up for grabs, not only in the host, but throughout the remote data bases as well. With Tandem's GUARDIAN/EXPAND Network, a local failure has no impact whatsoever on the rest of the



Conventional fixed network is difficult and expensive to expand and modify as needs grow. And they always do. Communication and utilization of data base records from twice removed nodes is prohibitively expensive in applications programming, so more lines are the only viable solution. And that is expensive, too.



Tandem pass-through packet switching enables "A" to communicate with "E" at no penalty in system overhead. And you can add direct lines, per "B" to "E" or "L" to "G" whenever traffic warrants without disrupting system performance or efficiency. Note that nodes can be of variable sizes, all using Tandem NonStop Systems as the common element. Efficient, powerful and extremely low cost.

system, and best-route switching automatically circumvents the trouble spot. If there is a failure in the communication link, the system will automatically go around it. The system and the network stay up and running, and best of all—the data is intact, its integrity assured.

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Whereas most network operating systems are created "on top" of prior operating systems, at significant penalty, Tandem's Guardian Operating System was created from day one for the multiple processor environment. It treats *all* resources within the system as files, both hardware and software, and accordingly achieves complete geographic independence, both for the user and for the user's programs. This is beautiful at any time, and it is a lifesaver when increased work loads call for an expanded system, more processors and peripherals, and perhaps a new configuration of resources. This is unique: no reprogramming is required, not even recompilation.

The long and the short of it—keeping costs down and performance up.

No one can do that like Tandem. For the differing needs at each node can be met by the expandable Tandem NonStop System in varying configurations. Single system programming works over the entire network and will continue to work regardless of growth and complexity of the system. And because this is after all a mini-based system, the costs are low to begin with and add-ons come in low-cost increments. Without one cent of penalty on the original investment.

Comprehensive software—transparent and segmented.

Under the overall supervision of GUARDIAN/EXPAND, the Network Operating System, each individual system maintains its own Guardian Operating System plus all of the multiple processor and control communications systems and a host of applications languages including industry standard ANSI '78 FORTRAN and ANSI '74 COBOL. With T/TAL, EDITOR, SORT/MERGE, DEBUG, TGAL, ENFORM Query/Report Writer, and complete remote diagnostic capabilities, the software package of the Tandem NonStop Operating Network is truly impressive. Best of all, it never requires one iota of modification as systems, nodes and the entire network expand and are modified to suit changing requirements. And any Tandem GUARDIAN/EXPAND node can communicate with IBM or any other mainframe using industry standard protocols. We've made it possible and practical to go from any industry standard system to a low cost, comprehensive and flexible network without sacrificing your original installation.

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Call or write for complete information about the Tandem NonStop Operating Network. We'll be happy to demonstrate both how and why this system will cost you less to begin with, less to expand, and less to operate than any other network on the market today. And most likely for years to come.

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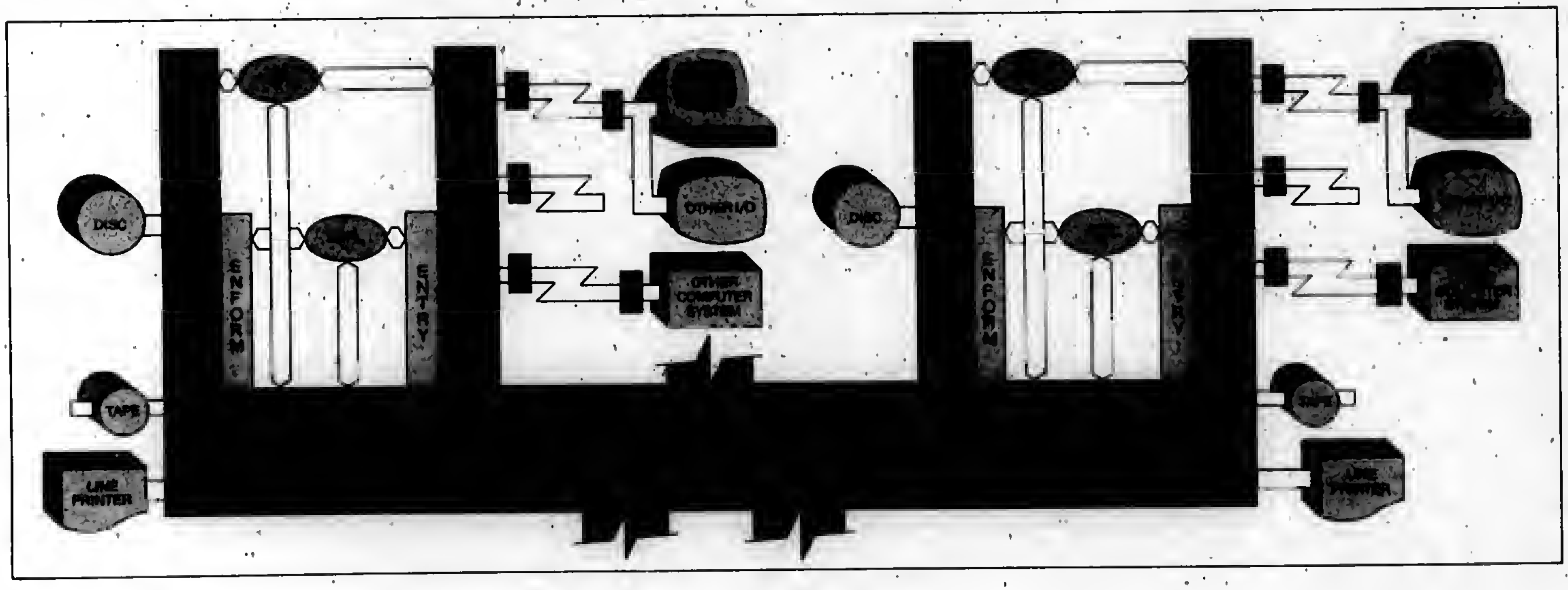

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TANDEM

Under Bank's Volunteer Program

Homebound Handicapped Learning to Program

By Jay Woodruff
CW Staff

PORTLAND, Ore. — The U.S. National Bank of Portland has devoted four years to teaching computer programming to handicapped persons at home.

Homebound Opportunities in Programming Education (Project Hope) is staffed entirely by volunteers from the bank. The project provides the handicapped trainee with a portable terminal and an expert programmer to teach him.

Since programming is "primarily a mental job, handicapped persons adapt to it very well," according to Linda Godson, data base officer at the bank and volunteer head of the program.

Programming instruction is tailor-made for each trainee, and although Cobol is emphasized because of its use in business, other languages are taught depending on the trainee's needs.

Training takes about one year, and students start writing programs as soon as possible because that is the most motivating and fastest way for them to learn, Godson said.

Students begin the course by reading an introductory textbook on computers. A terminal and a book on Cobol are then delivered to the student's home. The book contains practice programs that can be run after the student learns the time-sharing option system the bank uses to enter data.

At-Home Visits

Instructors usually visit the trainee at home twice a week for about three hours each time to answer questions about programs and to show the trainee ways to increase efficiency. "There are usually a lot of questions," volunteer programmer Linda White said. Trainees work at their own pace.

Some trainees also attend school, and they use the computer for school-related projects.

Students enter a program, run it and get immediate reports on the terminal. White said quick feedback keeps students interested in their work.

After three or four programs are successfully completed, the students usually are somewhat self-sufficient, although instructors continue to help them understand new procedures that appear in the text, teach them some that do not and clear up difficulties.

Cost to Bank

The total cost to the bank for Project Hope has been between $10,000 and $11,000, but bank officials said it can be done for less if some of the equipment is rented, as U.S. National did before it committed itself fully to the program. Portable terminals can be rented for $50 to $75 a month per terminal, Godson said.

The bank paid $7,000 for hardware and from $3,000 to $4,000 to set up the system. The biggest cash investment was for three Texas Instruments, Inc. terminals that cost $1,500 each.

Two other terminals are on loan from Pacific Northwest Bell, which has maintained a high interest in the project. For mainframes, U.S. National uses an IBM 370/155 and a 370/158 and plans to install a Model 168.

Volunteer Commitment

An important reason for the program's low cost is the commitment of its volunteers. Bank personnel are allowed to contribute two of their weekly work hours to the facet of Project Hope in which they have an interest.

Most persons who get involved in the project contribute more than two hours a week and derive a great deal of enjoyment from it, according to Godson.

"It's exciting to work with the handicapped," she said, "because many of them have not had a chance to get out of their homes and meet other people. When you plug them into the world of computers, they often blossom unexpectedly."

Graduates at Work

Two of the five project graduates work at the bank on a contract basis. When the bank needs a programmer, it contacts one of the two at home, and he estimates how long it will take to complete the job. The programmer is paid a fee, but if the job exceeds the estimated time, he is paid for that time as well.

Ronald Ryan, the first to take the Project Hope course, works for the bank. Hope gave him self-confidence and made a difference in his life. "Now I feel like I am contributing something that someone can use," he said.

Five more students will graduate soon. The number of students trained by the bank is limited by the number of portable terminals available, and Godson said the bank is at a turning point on whether it will expand the program.

One thing is certain, Godson said: "There doesn't seem to be any danger that the program will be stopped; I doubt we could stop it now. With our enthusiastic volunteers, nobody needs to be told what to do, and hardly any administration is necessary to keep the program going."

How successful is the Oregon bank's Project Hope? "Successful, but small," was Godson's assessment. She added that Affirmative Action goals can be met through the program, though the bank did not have this specifically in mind when it started the program.

More Talk Than Action

Although the program itself may be termed a success, one difficulty remains that the bank has not been able to solve — employment of trainees. The corporations contacted by the bank have expressed an interest in hiring Hope graduates, but few have done so.

"They talk about hiring, but they are very timid about hiring someone who will work at home," Godson said. The reason most often cited is the prohibitive cost of medical insurance for the homebound handicapped worker.

Although bank graduates are highly qualified, Federal jobs are almost impossible to get because of the red tape an applicant must go through when pursuing the job, according to Godson.

The bank has tried to promote support for the project and has worked to interest other banks by putting together a slide show. The show has resulted in inquiries, but no commitments yet.

"It just takes time," Godson concluded. "We hope we can get more positive responses in the future, and we realize this is just the beginning."

Mass. Taxmen Seek DP Advice

BOSTON — The Massachusetts Department of Revenue is seeking assistance from industry experts in preparing sales and use tax statutes for the computer industry.

DP industry representatives and other interested persons are invited to submit descriptions of equipment and definitions of terms used in the normal course of business — for example, hardware, software and descriptions of vendor customer arrangements.

Information should be submitted in writing by Dec. 19. The Revenue Department will meet on that date at 10 a.m. in the 8th floor conference room, 100 Cambridge St., Boston, Mass. 02204.

All persons wishing to attend are requested to notify the Commissioner of Revenue's office.

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Latest DP Executive Guide Lists 6,000 Entries

PHOENIX — The Fall 1978 edition of the *Directory of Top Computer Executives* with more than 6,000 executives listed is available from Applied Computer Research.

The directory is arranged geographically by city and state and has a cross-reference index by company name within industry classification. Three government classifications — (federal, state and local) — as well as health services have been added to this edition.

The directory contains 1,500 more entries than the 1977 editions. Guidelines for listing are gross annual sales in excess of $50 million or annual DP budgets of more than $250,000, a spokesman said.

Each entry includes the organization's name and address, subsidiary and/or division names, phone numbers, major systems installed and the names and titles of the top DP executives — vice-presidents, directors and DP or information systems managers.

In addition to the directory itself, the data base is available on mailing labels, magnetic tape, computer printouts or 3-by 5-inch cards, the spokesman said.

Many Uses

The directory is designed to be used for direct mail marketing, recruiting, arranging meetings or contacting other organizations.

Single copies of the directory cost $75, with additional copies priced at $45. An annual subscription, including two semiannual issues, costs $120, with additional subscriptions priced at $72.

Applied Computer Research is at P.O. Box 9280, Phoenix, Ariz. 85068.

Calendar

Jan. 13-April 28, Cleveland, Ohio — **CDP Review Course,** sponsored by the Cleveland and Erieview chapters of the Data Processing Management Association, Cleveland chapter of the Association for Computing Machinery and Cleveland State University's Computer and Information Sciences Department. Contact: CDP Review, P.O. Box 6772, Cleveland, Ohio 44101.

Jan. 15-17, Washington, D.C. — **Software Quality Assurance Seminar,** sponsored by Software Enterprises Corp. Contact: Lesley Toibb, 2239 Townsgate Road, Westlake Village, Calif. 91361. Also being held Jan. 29-31 in Los Angeles.

Jan. 15-19, Hartford, Conn. — **Course on MVS Internal Logic, System Design and Performance.** Contact: Computer Systems Research, Inc., 195 Main St., Avon, Conn. 06001.

Jan. 22-26, San Diego, Calif. — **Fiber and Integrated Optics.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Hously to Lead ICN Seminar

WINTER PARK, Fla. — International Computer Negotiations, Inc. (ICN) is sponsoring a four-day seminar conducted by Trevor Hously, data communications expert and author.

The seminar will be held in Denver Feb. 19-22; in Cherry Hill, N.J., Feb. 26-March 1; and in Orlando, Fla., March 5-8.

Designed to keep systems engineers and communications managers abreast of what is new in data communications, the seminar will present an orientation and review of key factors, including a highlight of developments and their applications potential.

The seminar costs $795, ICN said from 1331 Palmetto Ave., Winter Park, Fla., 32789.

Minis and Micros Topic of Conference

COLUMBUS, Ohio — Battelle Columbus Laboratories will hold a conference Feb. 7-8 to discuss how industrial, plant and process managers can better use minicomputer and microprocessor technology.

A special session will be devoted to demonstrations of minicomputers, software development and debugging systems, as well as graphics and interactive control.

Conference participants will be made aware of the general field of small computer systems, basic terminology and aspects of system procurement and development.

Registration information is available from Susan R. Armstrong at Battelle, 505 King Ave., Columbus, Ohio 43201.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Part of Analysis System

CPU Helping Fillings Stay Put

By Marguerite Zientara
CW Staff

SAN FRANCISCO — Dental fillings may someday stay in mouths longer and wear better, thanks to a computerized analysis system here that measures such factors, according to Dr. Joseph Moffa, dental research coordinator for the U.S. Public Health Service's Division of Hospitals and Clinics.

Because of the rapid development of dental restorative materials, Moffa said, a need arose for more efficient methods to assess their safety and clinical efficacy. Conventional long-term studies have been complicated by the time-consuming effort required for the development, maintenance and analysis of accurate dental treatment records, he added.

Dental Data on File

The two-year-old computerized system, funded by a National Institute of Dental Research grant, was designed to eliminate all data forms and manual operations associated with the collection of clinical data.

When a patient comes into the Public Health Service Hospital here for treatment, demographic and pathological information associated with the patient is entered into the hospital's data base through CRTs. "As treatment is rendered, the pathology file is debited, so it is always kept current," Moffa noted.

After materials for dental fillings are placed in patients' mouths, pertinent data is coded for the computer. This data includes the manufacturer of material, the date of the filling's placement and the person responsible for placement.

Each material is identified by a 5-digit code number. The 3-digit prefix defines the product name, and the 2-digit suffix identifies the individual batch or variable associated with placement.

For example, one 5-digit code number could identify the material, Dispersalloy, and indicate that it is unpolished. The system is capable of storing 99 variations of 999 different materials, according to Moffa.

Annual Evaluation

These materials are evaluated on an annual basis. Since the data about the materials is coded, at evaluation time dentists at the hospital can get a list of the names and addresses of all people with a certain material in their mouths by inputting a particular code. This same code prompts a printout of the patients' names and addresses on dental appointment postal cards.

When the patient comes in for evaluation the dentist makes his appraisal on a "blind" basis; he does not know the name of the material that is being evaluated.

For each material, two dentists make separate evaluations about factors such as the color of the material, whether it is wearing away or whether there is recurrent decay.

The computer compares the value judgments of both dentists and, if they agree, the evaluation goes into the data base. If they disagree, however, the system calls to their attention the tooth number, surface and specific criteria of disagreement, so they may arrive at a consensus, Moffa explained.

If photographic evidence is required, the CRT display will list the tooth number and surface to be photographed. Lastly, in the event a patient or a specific restoration is not evaluated, the reason is entered.

Reasons for nonevaluation are divided into three categories: those related to material, those unrelated to material and those associated with patient complications. "We feel the reasons for nonevaluation, especially in the related category, are very important and have been neglected in previous clinical studies," Moffa noted.

The appraisals are made annually for all materials. "At any point in time, we can compare substance A with substance B at three years, for example, and the computer will print out a descriptive statistical analysis of the areas of interest," Moffa said.

Knowledgeable Computer

The system has additional functions, Moffa noted. For example, when a patient is treated, the computer "knows" the patient's name, the name of the dentist performing the procedures and all the procedures performed that day.

At the end of the day, all that vital information is printed on self-adhesive labels that can be affixed to the patient's medical record. In the event the medical record is subpoenaed or needed by another facility of the hospital, the record is always as up-to-date as the computer's data base, Moffa explained.

In addition, in each of the hospital's two operatories — patient treatment centers — a 21-in. video monitor screen is suspended over the patient's chair so the patient can monitor the accuracy of his demographic information.

This process is used both for new patients and for updating the records of previous patients. After verification for accuracy, this information is transferred to the disk storage unit by a single-key operation and becomes part of the hosital's data base of clinical information.

"At any point in time, we can query this data base via the administrative terminal to give us a printout of the names, addresses and telephone numbers of all patients with specific dental treatment needs," he added.

The hospital uses a Wang Laboratories, Inc. Model 2200 computer with 96K bytes of main memory. Three CRT terminals are multiplexed to the CPU. Two are inpatient operatories and one is in the hospital's administrative unit, where it is used for word processing and other statistical backup functions.

With 10M bytes of disk storage, the system makes use of three Wang printers. Two of the printers are 240 line/min printers and one is a 40 char./sec daisy-wheel printer. The daisy wheel carries out word processing functions.

While private offices now use computers for tasks like billing, Moffa remarked, high costs prohibit them from using the technology for patient treatment and material analysis, as does the Public Health Service Hospital. The future may bring such widespread usage, if the prices come down on storage.

A video monitor screen, visible to both Dr. Joseph Moffa and patient, is used to verify the accuracy of data entries made by dental assistant.

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OUR TERMINALS HAVE IT ALL TOGETHER

Editorial

Keep Your Options Open

The key to successful implementation of distributed networks lies in the flexibility of these nets to accommodate the addition of services and equipment. .

From the user's standpoint, it is a foregone conclusion that applications will continue to expand and network services will be close behind. So the goal becomes one of finding the maximum capability for today's needs while still leaving room for tomorrow's demands.

It is an understatement to say that the number of contenders in the race to capture the user's distributed network dollars is growing almost daily. Basically these vendors have taken on characteristics that place them into one of four categories:

- The mainframe supplier which provides an architecture that creates an environment dependent on large hosts for efficient operation of terminal-based remote subsystems. An example is IBM with its Systems Network Architecture (SNA).
- The turnkey service vendor which typically evolves from an initial time-sharing network service supplier. This vendor provides local processors at remote user sites that are usually limited to operating on the vendor's network in some way. This group includes General Electric Co., which recently introduced Marklink.
- The "traditional" vendor of distributed DP hardware which has specialized in providing equipment at multiple sites. While most of these vendors provide some compatibility with large central mainframes, the emphasis is obviously on utilizing a maximum amount of distributed systems. Datapoint Corp. and Four-Phase Systems, Inc. are in this category.
- The carrier which provides the basic transport mechanism with added intelligence that allows the user access to any hosts operating on the public network. This group includes Telenet Communications Corp. as well as AT&T with its Advanced Communications Service.

Charting a cost-effective and flexible course through this sea of alternatives is not easy. Each of these approaches in its own way offers the user a solution to current network patterns.

Typically the existing user nets were initially configured around specific applications with specific solutions. As it becomes more cost-effective to move intelligence out to the remote site, it also becomes clear that multi-application nets are the wave of the future.

Further complicating the emergence of multifunction nets is the trend toward combining operations that have been separate within a company. This trend is moving beyond DP into voice, facsimile, word processing and other areas.

All this makes the job of the network manager an extremely complex one if there is to be flexibility to take advantage of tomorrow's corporate requirements.

The integrated multifunction, multitechnology network of tomorrow will be a key profit center in successful companies. Until these nets arrive, users must be careful to keep their options open.

Data Past

Five Years Ago
Dec. 12, 1973

WASHINGTON, D.C. — The U.S. Court of Claims ruled that many copyright notices forbidding computer storage and/or copying of published material might be ineffective and unenforceable. The court found that government users, libraries and other not-for-profit organizations enjoy "fair use" exceptions to copyright liability. The ruling was seen broadening this exception to other data processors who build data bases from published literature.

— — —

The computerization of accounting systems uncovered alleged embezzlements totaling hundreds of thousands of dollars in two separate cases.

The larger fraud concerned a Wall Street brokerage house, Cowen & Co., from which Henry Brady, a clerk, allegedly swindled $170,000 over a period of six years through a girlfriend's account.

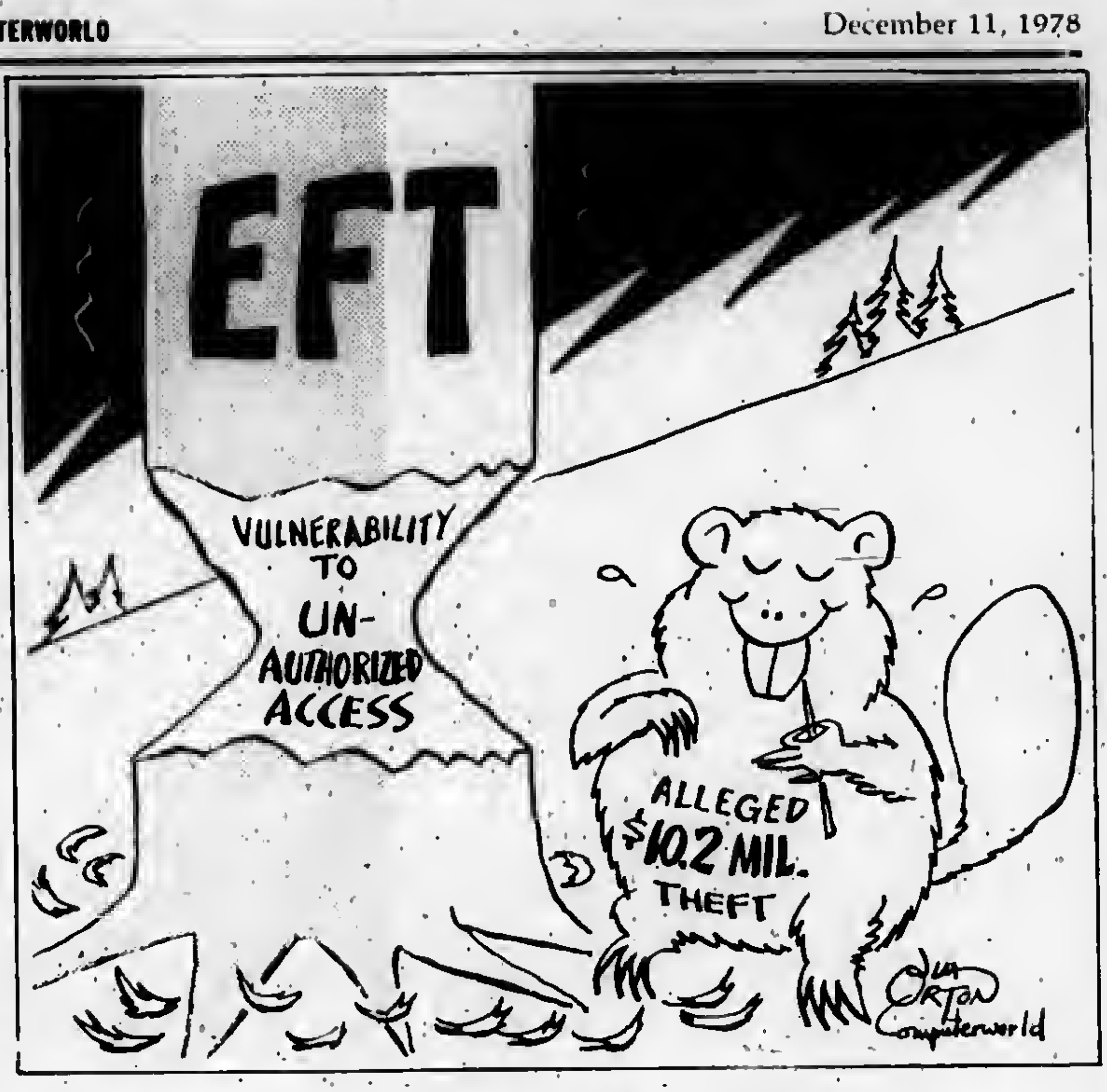
In the second case, Marguerite Pells pleaded guilty to the embezzlement of approximately $15,000 to $21,000 over a period of two years from Burke Sale Co. of Seattle, Wash.

Eight Years Ago
Dec. 16, 1970

RALEIGH, N.C. — IBM made available to customer engineers a remote, real-time data bank of maintenance information to assist them in diagnosing malfunctions and supply corrective action data at cutomer sites. Part of the Remote Technical Assistance and Information Network/370 (Retain/370) support system for 370 users, the data bank was designed to minimize interruptions to customer operations caused by problems with any IBM equipment or programming.

— — —

NEW YORK — Armed with a computer study that traced the union's hiring practices, U.S. Attorney Whitney N. Seymour filed a civil comtempt action against Local 46 of the Wood, Wire and Metal Lathers International Union. With the information from the computer, Seymour sued the union for allegedly refusing to hire more blacks.



Letters to the Editor

Bigger and Fatter

I have been reading several comments concerning the proposed 9-digit Zip Code and must agree that from a strictly economic viewpoint, such a change would be expensive.

There is, however, one thing that has not been remarked upon in any of the comments which will make the 9-digit Zip Code even more cumbersome. I'm speaking of the big, fat Zip Code directory now used to look up Zip Codes.

How fat will the 9-digit directory be? How many volumes will have to be printed to contain the billions of entries? Someone will have to look up all the new codes in this directory and assign them to the customer records.

R. Buckley

Orange City, Iowa

Two Bytes' Worth

I had hoped to stay out of the Zip Code controversy, but now I feel I must put in my two bytes' worth. The gentleman who suggested, a couple of issues back, that the code be made five alpha rather than five numeric positions so no changes to the file would have to be made must have had a very poor systems analyst.

Most installations with which I have been acquainted use either a packed decimal (three bytes) or a full-word binary (four bytes) field to store the code. The savings in storage media for a multimega entry file is considerable.

Those who choose the route of the packed data will have to change their record definitions (regardless of language) and make a one-time pass of the files to expand the field. On the other hand, those who store in binary can support the additional digits with only a change in the Cobol definitions. (Of course, in both cases there must be an alteration to the print format.)

I'm afraid, however, that my real fear is in the area of data storage and manipulation. Early in my career (late '60s), I was already running into situations where "near-sighted" programmers had saved only one position for the year, never bothering to consider what would happen 10 years hence.

Don't forget that Jan. 1, 2000 is just around the corner.

I, for one, consider the Zip Code problem to be one of minor but tolerable inconvenience; the dawn of the 21st century is another matter all together.

Joel Kurasch

Skokie, Ill.

No Pressure From NCR

During the last three years our institution, the First National Bank of Lake Forest, has purchased used NCR Corp. Century system components — 196K bytes of memory and two Model 657 disk drives — on the open market.

Not once during negotiations to purchase these units did NCR, the account representative or field engineering attempt to apply pressure tactics regarding maintenance of the equipment if purchased through a broker or from another user. Prior to purchasing the equipment, NCR was fully aware of our intentions, and maintenance was provided upon installation without hassles or legal problems.

Our relationship with NCR has been long-standing and mutually beneficial. It is my contention that if a user wants to sit down with NCR's corporate or local representatives to discuss a problem, they are understanding and responsive.

They have proven to be ethical and honorable in our dealings. So if you want to nitpick and dot all the i's and cross all the t's in a contract, go ahead. However, I think it is a waste of time.

William Henderson
Assistant Vice-President
First National Bank
Lake Forest, Ill.

Reader Commentary

TV Makers Should Sell Personal Computers

By Peter R. Newsted
Special to CW

As a computer user and instructor who frequently covets his own personal computer but wonders when the prices will come down and how to supply applications for it, I stumbled upon the following possibility. Perhaps Zenith, Sony, RCA, Panasonic and others are already at work on it.

Because of their size and marketing base, TV manufacturers must be the ones to market personal computers and make money at it. This is logical because the primary appeal of personal computers is playing games, and CRT televisions are required to do this (especially in color).

It is also desirable to have major firms behind software development rather than the cottage industry of "Ma and Pa" computer stores. Having TV firms market and manufacture personal computing gear not only would allow economies of scale, but would also present an image of a good firm standing behind an exotic product. People would feel confident that they could get their personal computers fixed if they broke.

Having the TV industry as the center of the personal computing market has several other ramifications. TV would seem to be the focal point — rather than the telephone — because of interactions with other media. For example, RCA's camera that records pictures on a chip for viewing on a screen would be a logical application extension.

Get Networks Involved

Computer-generated displays — like the ones on some TV stations in the UK — would seem more natural and acceptable when generated by a TV network. In fact, networks themselves might generate programs with which home computers could interact.

This would probably be in only one direction; one would store recipes from the TV network, receive the source code for a new game or play games with a computer-generated situation.

The strategy should be to stress the personal computer's applications and games, not its user-programmable aspect. Obviously, only a very small percentage of TV owners have any interest in programming, but almost all of them would like the arcade and calculator aspects of personal computing, particularly in response to mass media advertising and a national service reputation.

Creative Cassettes

Having larger firms behind personal computing would ensure a wider range and higher quality of applications, probably at a very cheap price. Applications will not sell if they cost more than a board game, pocket calculator, musical record or tape.

Progamming itself should be treated as an application. Compilers should come on cartridges or cassettes like other applications.

In addition to eliminating the programming stigma from personal computing — people will always be afraid of things they do not fully understand — this should improve the quality, variety and availability of computer languages for those like myself who do wish to do personal computing.

Sophisticated games such as chess must also come on cartridges. Imagine the advertising gimmicks: "Our cartridge beats 40% more masters," or "Whizzo backgammon is 10 times more challenging." The marketing potential exists for all ages, especially game-oriented children.

Computer-assisted instruction (CAI) cassettes would be possible. Courses for credit could be put on cassettes, and responses could be recorded, instantly graded — with the grade written on the cassette — and then turned in for credit.

Modified Keyboards

With all due respect to data entry, full keyboards are not the best. Many people do not like to type; many games can use simplified keyboards and joysticks.

Perhaps keyboards that light up with different symbols would be appropriate. The required symbols would be generated by the application or game being run. Different approaches from different manufacturers would be rampant until some won out and standardization set in.

Video cassette development and marketing seem to be a logical path to follow in developing personal computing capabilities. If people are willing to pay $1,000 for a video recorder and playback system, they would probably do the same for a sophisticated home computer — particularly if it cost less and was not called a computer.

Standardizing formats would be essential — probably standard or micro cassettes would be used as well as full video cartridges for longer applications, compilers or libraries of games.

Both the video unit and the standard cassette recorder should serve as forms of off-line storage for program code.

One Exception

I see only one exception to the TV industry's wide-ranging expansion into personal computing. This is the traditional area of business DP.

As business computing is more peripherals-oriented, especially with respect to disks and printers, its need for personal computers will still be better served by lower end machines from existing mainframe manufacturers which already understand business needs — such as payables, receivables and general ledger — and recognize the need for hard copy and quick access to records.

Newsted is an associate professor of management information systems at the University of Calgary in Canada.

The Taylor Report

NCR's Universal Contract Sparks Continued Debate

By Alan Taylor
Special to CW

My suggestion that NCR Corp. write into its Universal Agreement the guarantees to customers [CW, Nov. 20] cited in the letter from Ben E. Olive, associate general counsel for NCR's legal department [CW, Oct. 30] met with swift response from readers and NCR users. So far I have not heard from NCR.

An article in *The Cooperative Health Care Users' Group Monitor* in March 1977 reported that many user law departments did not like the Universal Agreement. Its headline, "Universal Disagreement," may have been somewhat overdone.

In addition, I discovered many authorized versions of the Universal Agreement exist, so its claim to be "universal" is also somewhat overdone. However, the differences in the versions with which I am familiar are cosmetic rather than substantial.

I even discovered that some NCR users that have not had to change mainframes since the Universal Agreement came out about 1973 or 1974 are operating without the Universal Agreement and do not intend to sign it at all.

Still, the most interesting thing I found out was what a colleague of Olive's, Robert Conway, thought about the Universal Agreement and its implications. Readers might like to know what other members of NCR's legal department think so they can compare these thoughts with Olive's present and future comments.

In one case, a user argued that NCR had sold him his computer knowing he intended to increase the memory capacity to 256K bytes without future purchases from NCR. Then the user found out he had to buy NCR memory if he wanted to increase his capacity.

Denying the user's allegation, Conway wrote to the NCR user's attorney. He put it this way:

"I believe that you will find the applicable contract in this matter is very detailed and complete in every respect. If your client felt

(Continued on Page 30)

The Human Connection

MIS-Communications Effective, Gainful Mix

By Jack Stone
Special to CW

Who would have thought, just a few years back, of linking digital facsimile terminals to a store-and-forward mainframe switch? Or tying word processors to host computers for high-speed document printing? Or using an integrated multiterminal station as an automated office for a distributed DP network?

Well, as described at the Interface West Conference and other recent symposia, such capabilities appear to be just around the corner, again offering a whole new set of opportunities — and challenges — to the management information systems (MIS) organizations.

One question which naturally arises is which department should be responsible for developing and acquiring these advanced systems. Should it be the administrative and communications function which historically ordered office, photocopy and voice communications equipment?

Or should it be the MIS department which has long — and hopefully successful — experience as an implementor of complex DP and data communications systems?

Back Into History

A member of a vendor organization who is a former marketing student of mine provided this thoughtful opinion on the matter, based on his many years of selling electronic systems and components. While his experience has been almost totally in the retail industry, I believe his observations are generally applicable:

"To gain a proper perspective of the relationship of the communications and MIS functions within the retail business, we have to go back into history for a moment.

"In the early days, voice equipment was ordered by the building engineer or, in certain cases, by the janitor since phone service was looked on as a utility like electric and heating services.

"As the communications gear became more complex and useful, it became more expensive.

(Continued on Page 32)

Longer Zip Code Only Means Higher Costs

Reader Commentary

As a long time supplier of computer services to the much maligned health care industry, our company views with great concern the consequences of arbitrary decisions made by government agencies, even when they are made with the best of intentions. This concern includes the U.S. Postal Service's Zip Code expansion, a seemingly minor request.

Almost every new law and its subsequent regulations, it seems to me, inevitably leads to an increase in the cost of doing business. Some laws affect our business directly by the imposition of new or increased taxes; others increase costs indirectly since compliance requires added use of our business resources, be they manpower or equipment.

New rulings made in connection with existing laws and regulations further compound this situation.

Of course, each new health care ruling brings with it the assurance that compliance will either reduce taxes or prevent abuses within the system. Sometimes the regulators claim it will do both.

Regulations are issued, dates for compliance are set, data requirements are determined and forms are designed. Sometimes, although rarely, forms flexibility is such that computerized reporting is really a welcome opportunity.

But always, however, instruction manuals detailing reporting requirements and procedures are "soon to be issued and released."

Even in the absence of detailed examples, most will agree that complying with new or changing federal regulations is a major problem and a greater concern. We do comply, but voluntarily? Hardly.

Every regulation which increases workloads bears with it burdens of higher costs which must be passed along to the final consumers of our products or services. Therefore, anything — *anything* — which might raise our costs we try to avoid.

Since the original implementation of Zip Codes did not hold the line on escalating postal rates, we have little faith that its expansion will do anything except raise costs.

The Postal Service Zip Code request is one we will not adopt voluntarily simply because we are hard-pressed to meet the demands of changing regulations which directly affect our clients. And they say, more changes are coming. Now, if only we had some specific instructions we could . . . .

Kurowski is president of CBA Data Services, Inc. in Chicago.

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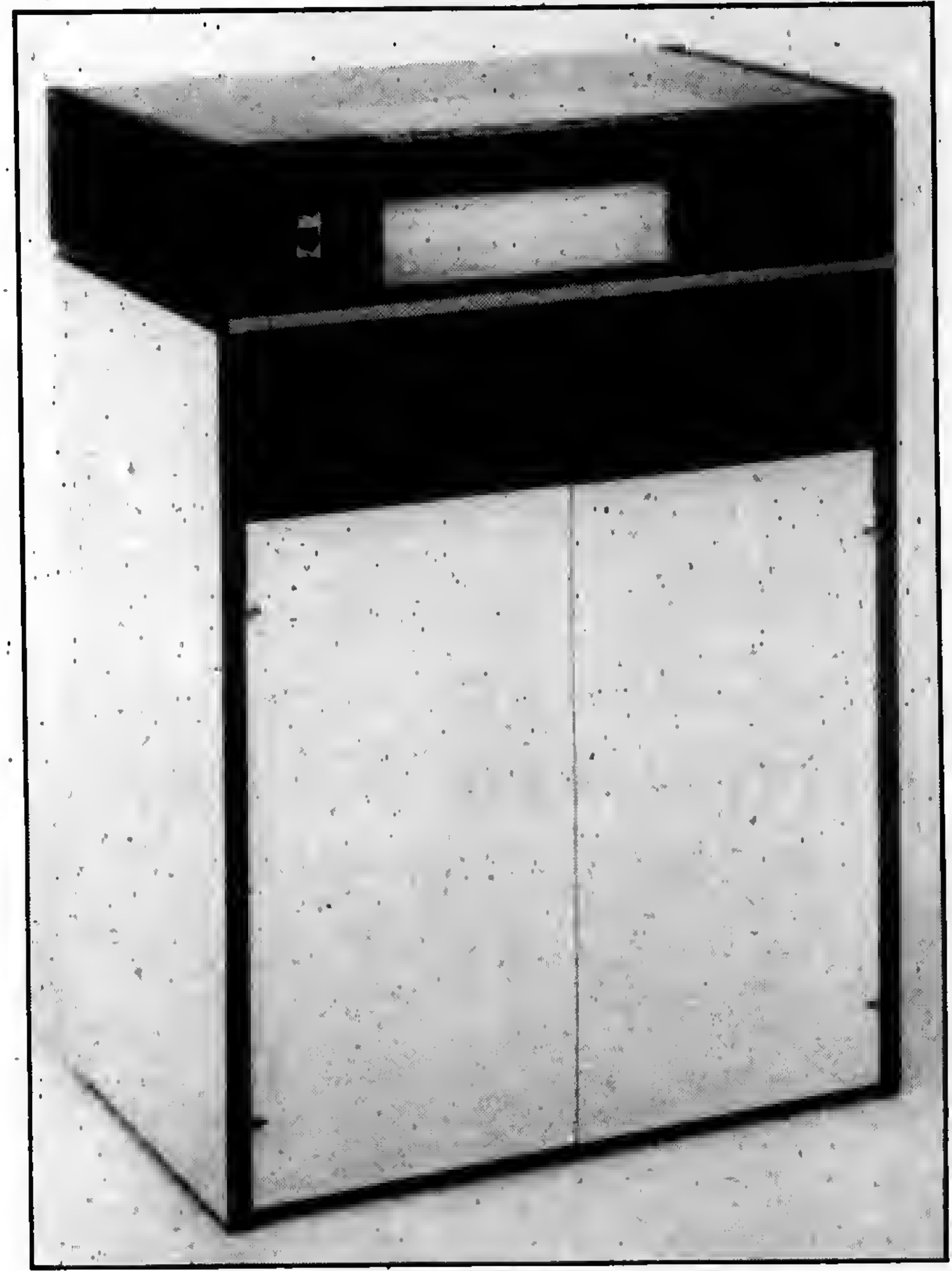

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Letters to The Editor

Data Set Management

In "CPE Effort Eases Manufacturer's DP Functions" [CW, Nov. 27], Ron Gallager, of Bendix Corp. did a nice job explaining the need for computer performance evaluation.

What Gallager failed to explain is that a performance measurement system can only identify the areas that must be addressed to realize optimum performance for both CPU and DASD.

The Bendix Corp. recently purchased two copies of DMS/OS, our disk management system, which is now providing it with tools to take action upon data sets in order to reconfigure DASD packs.

Donald A. Murphy
Director of Marketing
Software Module Marketing
Sacramento, Calif.

Not Far Off at All

I found "Capacity Planning Seen Vexing DP Managers" in the Oct. 30 issue a good article that summarized the existing capacity planning problem.

However, I do take issue with the statement that "computer models to do capacity planning are still far off."

Apparently the speaker was not aware of our Scert Performance Prediction System. DP Managers of more than 1,000 companies have used it for capacity planning.

H. Fred Silver
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To Ease Communication

‘Systems Planning Ombudsman’ Needed

By Herbert Reichlin
Special to CW

Reader Commentary

This summer, while attending the 25th alumni meeting of my college graduating class, I encountered an experience I thought was restricted to doctors, lawyers, architects and plumbers — my advice was asked.

Although the questions asked by three old friends were different, they all boiled down to pretty much the same thing: "How do we know the DP system they are working on in my company will do what we want it to do and not turn out to be a very expensive mistake?"

I've worked in most areas of the computer industry — as a user, a salesperson, a systems developer in both hardware and software — and I am therefore very sympathetic to those on both sides of the question, the systems developer and the user. The single biggest problem I have discovered is the communication block.

Most end-users have never participated in the kind of sequential analysis that systems development requires. They are not aware of the various logic levels involved, the overall goal, the internal and the external requirements, the various lead times, the need for all the separate parts to mesh in a neatly structured whole.

Like Toy Directions

Most systems developers will easily talk of the software and hardware requirements, but they have had little or no experience in product planning, marketing, manufacturing or delivery scheduling.

Their questions are asked in language that may have different meanings, one meaning for themselves and another for the end user. They do not know how to put their questions in the language and context the end user understands.

In many ways this reminds me of the directions that came with the unassembled toys we bought for our children. At times it seemed as if the writer presumed we were master cryptographers. Obviously the manufacturer never did a field test of the instructions to find out if its customers would be able to use them.

Essential Questions

To each of my three friends I put the same set of questions: "Was the overall purpose of the project described in written form and signed off by both you and the systems developer? What documentation method is being used by the system developer to make sure the system stays on track? In what manner do you get progress reports? What systems tests have been agreed on? How will the transfer to the system be done?"

From all three I got the same startled response — surprise at my questions and little understanding of what the questions meant.

New Job

It was at this point that I thought of the phrase "systems planning ombudsman." The two participants in the project, the system developer and the end user, want to communicate with each other so the project goals can be achieved. Yet each is uncertain whether they are working on the same problem and trying to achieve the same goals, and each dreads the thought that when the system goes on-line, it will be a failure.

If I am right, considering my experience and the articles that have appeared from time to time in *Computerworld* on this topic, then our industry does need to create this job classification of systems planning ombudsmen.

The consultant fee for this individual could be listed in the corporate accounting records on the same schedule devoted to insurance premiums, because that would be the single essential purpose — ensuring that the end user got the system for which he had contracted. That insurance (or assurance) would be worth a substantial premium.

Reichlin is manager of operations and control for the Governor's Council on Drug & Alcohol Abuse, Commonwealth of Pennsylvania, based in Harrisburg, Pa.

Look at what Edutronics acquired when McGraw-Hill acquired Edutronics.

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NCR Universal Contract Debate Continues

(Continued from Page 27)

this aspect of his purchase was so important, it would have been very easy to add a statement to this effect to the contract.

"However, since that was not done, I feel confident that your client is precluded from relying upon such unsubstantiated oral agreements at this time.

"I direct your attention to Section 1 of the Universal Agreement which addresses this very situation. For your convenience, the applicable sentence reads as follows:

" 'The contract, comprised of this Agreement and the order, shall constitute the entire agreement of the parties and shall supersede all prior agreements or understandings, whether oral or written, and all negotiations, letters, other papers and proposals except as attached to the order or specifically incorporated by reference.' ".

In short, it doesn't matter if your NCR representative tells you something verbally or in writing. You will still have to rely on NCR's goodwill rather than any legal right unless it is written on that original order.

Vague Identities

While Conway correctly interpreted the legal terms of the contract under NCR's Universal Agreement, he failed to mention some important technical points. Unlike Conway, I find the contract lacks some essential details which make it far from simple, perhaps impossible, for a user to get some vital items put into contract. One problem is that the NCR products are given vague identities.

The actual products have engineering names, which may or may not really identify them, names like "656-102/301 disk drives" rather than "Criterion" or "Century." As is the case with other manufacturing firms, what is underneath the label may change without anyone outside being aware of it.

In fact, two different users receiving what they believe is the same gear at the same time may be getting different items. And there is no way for users to know about this and protect themselves.

Consider the memory situation. You buy a computer with a small basic memory, and you want to grow. So you find out the cost of the additional memory; if you buy from NCR, it will be standard.

When you get the new memory, you think you will be able to keep your old memory, too. You use it and you are sure you still have your old memory, since you still have the same addresses. Right?

Wrong. At least, not necessarily right. The vendor may have taken out the old memory and replaced it with a larger new one. You have really traded your memory, not added one. And trading in computer gear may be financially dangerous.

The problem, which has been around for about 20 years, is that the easiest way to sell computers is to emphasize their growth capacity, while the easiest way to build and deliver them is to stick with the sizes of memory logically involved (32K, 64K, 129K bytes and so on). Marketing facts fight technical facts, and the result is the description of the items in the catalogs and brochures is often too vague to properly identify *what* is being sold.

A detailed computer contract should identify the addressing circuitry, memory interfaces and I/O trunk interfaces that will be physically installed, *whether or not they are used*. Certification and acceptance tests can't tell the user about this.

Such information is important when considering future values. But if the contract cites, for instance, "NCR Model 615-101 with 32K bytes of memory installed," that doesn't tell you much about what you bought.

On the other hand, if the contract read: "Must be sold back to manufacturer if more than 64K bytes needed," then the customer might ask questions the salesman would rather not answer.

Because vital characteristics about the system are left out in favor of a vague marketing identity, I cannot agree with Conway that the NCR contract is "complete."

If NCR customers are going to benefit from those guarantees Olive mentioned, he should write them into the Universal Agreement. I'm waiting to hear that this has been done or else be shown by a hard-nosed lawyer that despite Section 1 of the Universal Agreement, such changes are not necessary.

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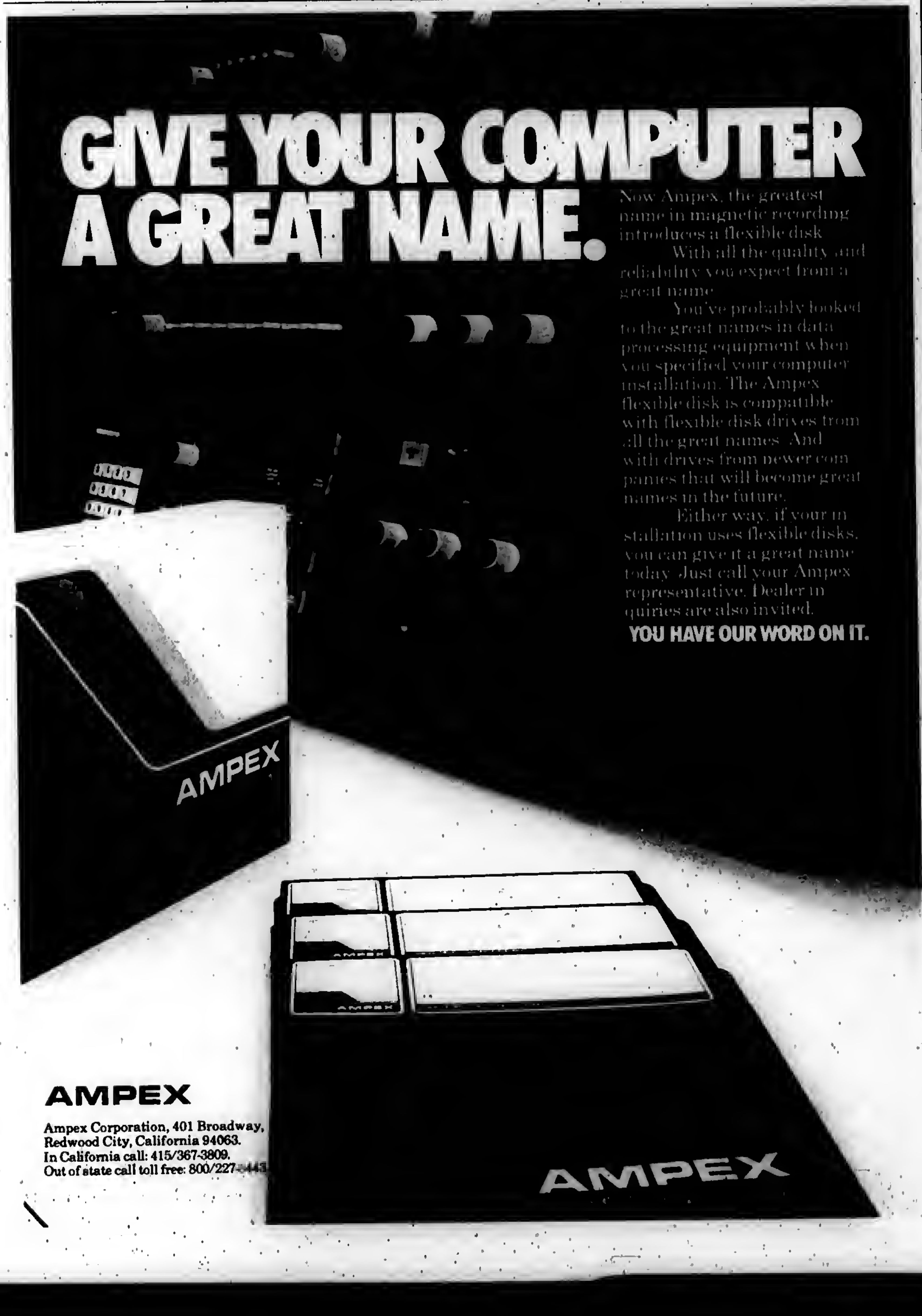

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Important Benefits Possible

DP Should Be Equal to All Corporate Areas

By James T. Walsh
Special to CW

With the advent of computer applications to business controls in the early 1950s, the functional administration of these machines and their output was almost universally placed in the hands of financial personnel. The most obvious connection was their ability to process huge quantities of numerical data and to manipulate this data to produce various reports which made possible easier, quicker and more detailed financial analysis of the business being controlled.

Numbers being the province of the financial people, control of these machines and their operators, in most instances, automatically fell under the jurisdiction of the chief financial officer of the business.

Of course, it wasn't always finance which controlled data processing; sometimes, because of strong functional heads or bias on the part of the top decision maker, other areas controlled it. Almost without exception, however, DP was subservient to some other functional area and did not report to the chief executive.

You will note I say "DP," not "information management," "systems management," "information systems," "information processing" or any of the other current terms. It was, back then, simply data processing.

For some time there has been a trend toward recognizing information systems management as an entity in itself and not an element to be subordinate to another function. The recognition of the real nature of this function has, in many cases, given DP equal status with the other major elements of a business. There has, however, been a lack of publicity regarding this evolution, particularly in medium-sized companies, and I feel more emphasis should be placed on this transition.

Control of DP

Through successive generations of computers, even though on-line applications for operational control in each function of a business became not only a reality but a necessity, control of the DP operations has remained a part of the financial function. Only recently has the real purpose of the function been recognized as being of equal importance to top management as any function of a business, be it manufacturing, engineering, marketing or finance.

Interplay of information between and among the other functional areas justifies transfer of the information management operation from control by one of its clients to status as a partner equal in importance with all its served functions. In this way the function can be allowed its greatest latitude in developing true business systems, serving the special needs of each area and still providing a common data base for generation of the reports needed by corporate management for overall control.

Moving information processing from a subordinate position to an equal partner with other functional areas can accomplish several important things:

- The stigma of other functions working through the financial department or another discipline to obtain data needed only by the involved unit is removed.
- Consideration can be given by information management to the merits of individual requests for aid.
- The information management operation can more easily acquire professionals from the other disciplines.
- Filtering of requests for assistance to assure fitting into a financial or other biased view of the operation can be eliminated, and requests can be more easily evaluated on the basis of aiding overall efforts.

Reader Commentary

- The managers of the information management operation will be given the opportunity to truly become information specialists in all areas of the business.
- Most importantly, top management will have direct access to the information specialists when deciding the types and degree of data needed for day-to-day control and for special analysis of alternative courses of action or aberrations which arise.

Lower inventories, shorter manufacturing cycle times, more timely production to customer requirements, better control of cost elements, smoother introduction of engineering changes and products, quicker processing of orders, better market analysis and identification of variances, margins and profits are the products of the DP cost cen-

(Continued on Page 32).

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MIS, Communications Merger Seen Gainful

(Continued from Page 27)

But people untrained in DP remained in place, growing more powerful within the company, as they grew into the roles of key decision makers.

"For example, 'phone service' at major retail locations may typically rent for $5,000 per month. Figuring a 60-month payout, 'we're talking about a decision worth about $300,000 being made by, with all due respect, a clerk.'"

Threat to Autonomy

"In many firms, as the MIS department grew, the communications decision maker saw a major threat to his independence. He saw how MIS could attract investment dollars from the company for new and expanded capabilities, whereas he was always directed to cut expense.

"He was not enchanted with the negative attitudes of the MISers with regard to his newest baby, data communications, which they characterized as 'merely an overhead item to carry information around.' Jealous of the MIS group's advanced technical knowledge, he saw little opportunity to expand his own knowledge of the technology.

"He saw the handwriting on the wall for an ultimate merger of the two organizations, based on two advances in technology: terminal stations and switching devices which were essentially user-programmable and lower-cost communications devices and transmission facilities.

"The programmable devices, as for any DP novice, were baffling to the communications manager. And he felt ignored by top management, which was impressed with the lower cost communications and placed increasing demands on the MIS department — not the communications department — for new on-line systems."

Battle for Survival

"So the communications manager went into battle for survival. But for the retailers, the battle was short-lived. In most of the big traditionals, the MIS director won hands-down and took over all voice and data communications responsibilities.

"The major exceptions are several of the biggest retail organizations. In these cases, the identities of the warring factions are intact and a truce exists, but nobody is saying for how long.

"I, for one, believe the merger of the information systems and communications functions is the right way to go. It forces DPers to take the business of telecommunications seriously and apply their planning and systems analysis techniques to cost-effective designs of complex data and voice communications systems.

"The merger is also good for the vendors. It forces us to think in terms of total DP/data communications systems as we deal with the MIS buyer, which in turn, makes us provide better service to our customers," he concluded.

Readers with comments about DP-related management or other people-oriented problems are invited to write to Jack Stone, Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

DP Should Hold Equal Position

(Continued from Page 31)

ter.

Many of the above factors are only peripherally involved in the financial area. Each, of course, has an impact on the detail utilized by finance, but the present generations of computing equipment, using on-line terminals, move the need for utilization of specific data away from finance and more directly into the other functional areas of business. Each has its own need for information in a format unique to that function and each, therefore, becomes as important in its own needs as finance.

Proper Place

By removing information processing from a subordinate position to its rightful position as an information receiving, processing, storing and generation function, standing equal in stature with the other elements of the business, the real potential of this 30-year-old "revolution" will begin to achieve its proper attention and its proper place in the business organization.

I strongly recommend the transfer of information management to an organizational level equal to finance, manufacturing, marketing and engineering. This step will properly position information management to provide needed information systems to all the business functions while maintaining a data base from which management can extract necessary control reports.

It will also provide direct control of this vital function by the chief operating officer without the buffer that now exists. Only in this way can DP truly become a business information processing system entity.

Walsh is director of manufacturing services for Philips Industries, Inc in Dayton, Ohio.

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NBS Scientist Warns:

Four Obstacles Stymie Queuing Models

By Don Leavitt
CW Staff

PHOENIX — The popularity of queuing models has been growing steadily in recent years, largely because they are economical both in cost and in the view they provide of the essential determinants of system performance, according to Richard F. Dunlavey of the National Bureau of Standards (NBS).

Summing up the "State of the Art in Analytical Modeling" in the November issue of *EDP Performance Review* (EDP/PR), Dunlavey added that queuing models embody increasingly realistic assumptions and produce forecasts "generally within acceptable error bounds."

And, he added, they promise to fill the need for forecasting tools created in the wake of widespread disillusionment with commercial simulation packages. However, four major obstacles to more general acceptance of queuing network models remain, Dunlavey warned.

Charges of unrealistic assumptions are one of these problems, he said, noting that in order for queuing models to be solved formally, a number of restrictive assumptions must often be made. They assume exponential service times, he said, whereas real systems almost never exhibit such behavior, and they envision no CPU-I/O overlap, but "real systems sometimes have some."

Such assumptions have cast doubts on the models on which they are based, even though "great strides are being made to overcome the problem," according to Dunlavey.

"Perhaps the most respectable" defense against these charges has taken the form of mathematical research into extending the generality of queuing models by combining modeling techniques that take advantage of the peculiar strengths of each approach and by applying approximation techniques to the solution of more realistic, less assumption-bound models, he commented.

Inadequate Validation

Inadequate validation of the models is another major obstacle to their acceptability, Dunlavey said, taking time to note the "bewilderment and surprise" of modelers at the accuracy of their own results.

The "counterintuitive" accuracy of such models has led some to conclude that queuing models appear to apply to a "far more general" class of systems than their stringent assumptions would imply, the NBS scientist added.

On the other hand, he added, some important projections still fall short of desired accuracy and others "are all but impossible" to get.

C.A. Rose and others have often cited the lack of suitable tools to obtain the measures needed to drive queuing models as a major obstacle in their use, Dunlavey continued. These critics argue that hardware and software monitors have been designed to measure bottleneck symptoms directly "but disregard the needs of the modeler entirely."

Dunlavey clearly agrees with that complaint. He noted that "'think' times, mean device utilizations, selection of 'representative' periods of system time . . . require instrumentation and analysis techniques that lie far beyond what the market can sup-

(Continued on Page 36)

FDP Rates Printing Under OS

WHITE PLAINS, N.Y. — The Print Load Analyzer (PLA), a Field Developed Program (FDP) from IBM, was designed to enable users in OS environments to develop a picture of their overall printing environments. This should ease printer selection, aid in load balancing and simplify forms usage accounting, a spokeswoman said.

Although other tools have been developed to help the user rate the productivity and performance of a DP system, printing equipment has normally taken second place in performance measurement concerns, she commented, adding that until now the amount of printing accomplished was measured by forms usage and paper inventory control.

PLA is linked to System Management Facility (SMF) data, and that means the study of the printer load can be more detailed than before. SMF data can indicate how much printing is submitted from remote locations and specifically which jobs take longest to print regardless of how much paper or how many forms are used, she said.

The package also can determine which system in a multisystem environment creates the most printing or which printer, if several are in use, is the most productive.

Reports through PLA show the daily print load at an installation along with a summary of the measurement period, providing tallies of specific forms used. Definition of what activity is to be measured and for what period is under user control, the spokeswoman indicated.

PLA is cataloged by IBM as 5798-CXY. Monthly license fees ($90) are waived after the billing of 12 consecutive montly charges. As an FDP, the package has limited support.

'Microbol' Backs PDT-100 Users

ALTAMONTE SPRINGS, Fla. — Called the first high-level language developed to complement Digital Equipment Corp.'s PDT-100 "intelligent" CRT-based processor, Microbol — from Microbol, Inc. — includes an operating system, language processor and disk management facility.

The package is intended to support business-oriented DP functions, especially by taking advantage of the VT-100 CRT's attributes. These include split-screen scrolling, dynamic cursor addressing and full software control of all screen options, a spokesman reported.

Complete program compilation is not required: Microbol statements are incrementally compiled and interpretively executed. It provides operand substitution for effective use of subroutines and allows nested subroutines and subroutine return stack control, the spokesman added.

Microbol also permits individual and vectored transfer of program control based on function keys, input control keys and program-generated conditions, he said, noting data fields may be defined and redefined without restriction.

The system supports indexing — "not just subscripting" — and provides decimal point control and numeric field editing, as well as a "simplified uniform indexed disk file facility" for direct access of records by key, he continued.

Microbol operates within 16K words of memory supporting application programs that can be shared by multiple users. The system permits overlapped input and output operations under program control.

The first application of Microbol is an on-line medical system for physicians' offices. Marketed by Microbol Medical Systems, Inc. for $12,500, it includes the software, a DEC PDT-151 dual floppy disk processor, a VT-100 CRT and an LA180 printer.

More information is available from Microbol, Inc., Suite 118, 711 E. Semoran Blvd., Altamonte Springs, Fla. 32701.

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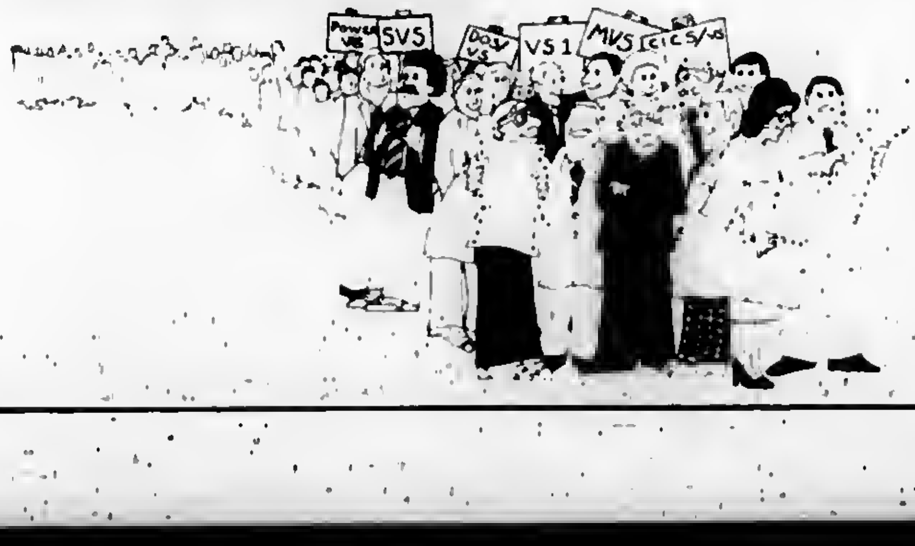

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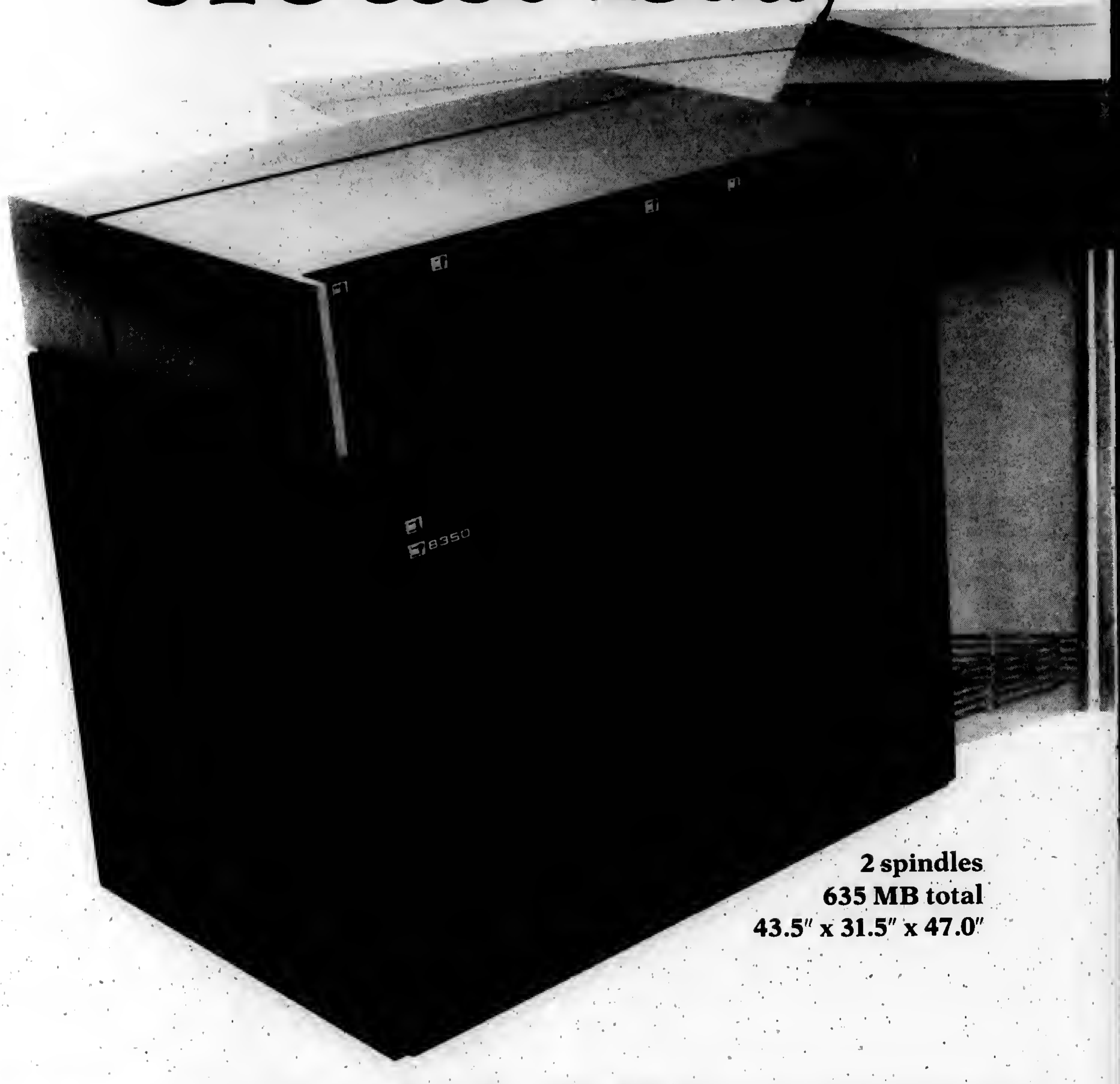

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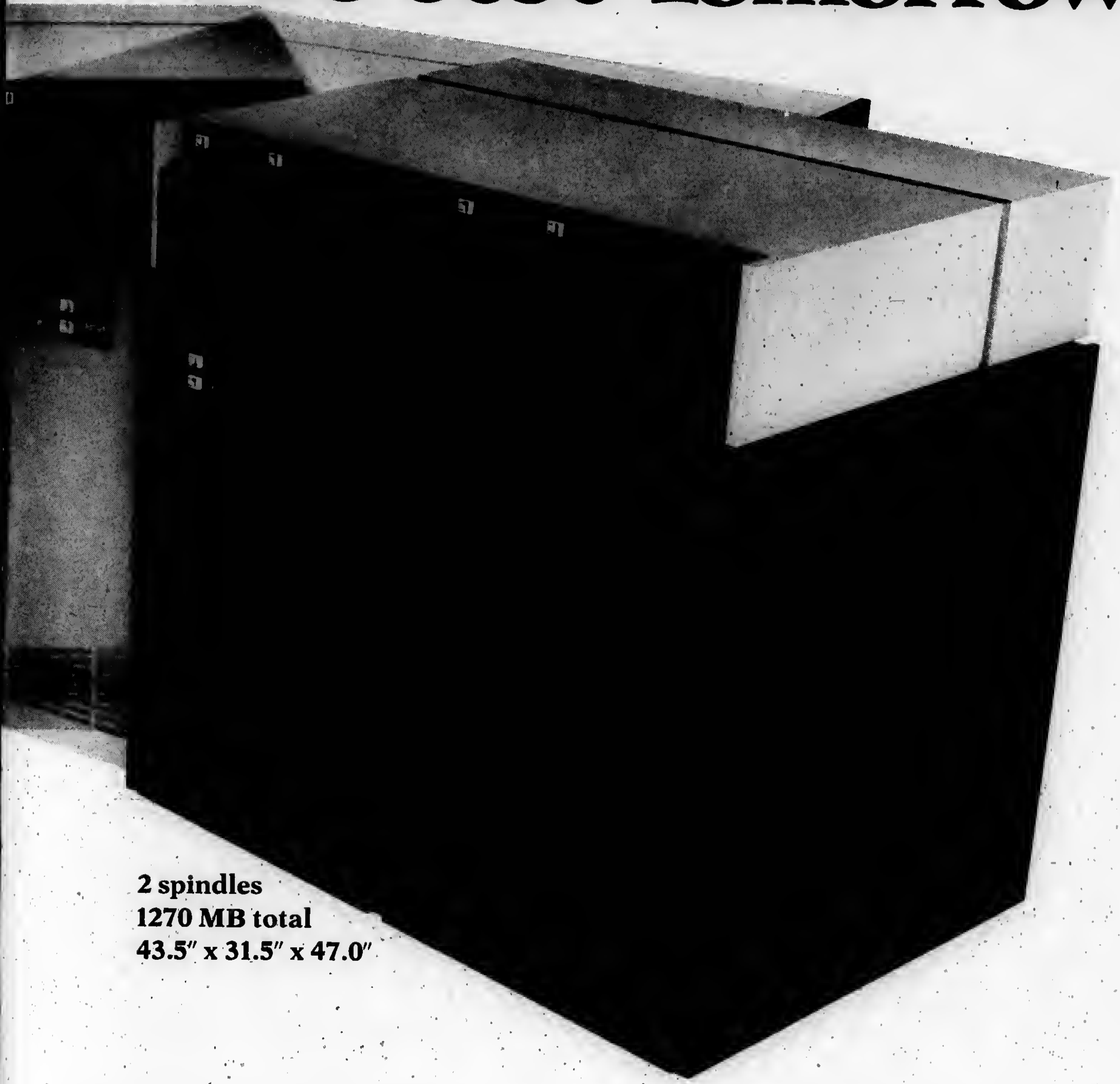

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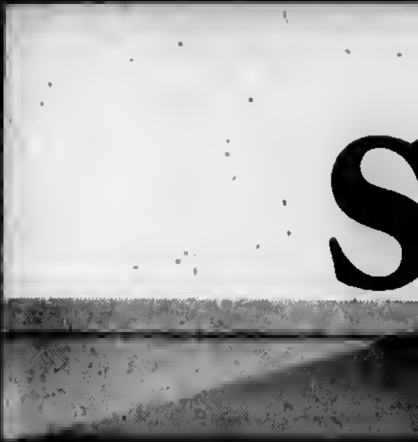
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Personnel Work Supported

CHICAGO — An enhanced version of the Payroll/Personnel System from Cyborg Systems, Inc. now being delivered to users includes significantly better support for personnel work, and the payroll operation was also improved, according to the vendor.

Until the current release, the Cyborg package left the user in "sort of a 'do-it-yourself' " personnel capability, a spokesman volunteered. The expandable data base provided for payroll work allowed users to add personnel-type entries and there was one standard Equal Employment Opportunity (EEO) report. The built-in report writer facilities let users generate whatever output they thought appropriate, but "it really was up to them to do the work," he admitted.

Now, in the spokesman's words, the vendor "did what any of the users could have done. We designed a number of transactions and created about 25 reports," all focused on supporting the user's Equal Employment Opportunity (EEO), Occupational Safety and Health Administration (Osha) and Employee Retirement Income Security Act (Erisa) reports.

Written in ANS Cobol and operational on IBM, Honeywell, Inc., Univac and Digital Equipment Corp. full-scale systems, the package costs $35,000, Cyborg said from Suite 2225, 2 N. Riverside Plaza, Chicago, Ill. 60606.

Package Lets Users Develop Forms on VT100 Screen

MAYNARD, Mass. — Digital Equipment Corp. has a series of utility programs for users of its PDP-11 minicomputers or PDT-11 intelligent terminals that are said to permit development of CRT screen equivalents of standard paper forms.

The Forms Management System 11 (FMS-11) allows the construction of customized forms and specialized applications on systems using the company's VT100 terminal. Screen manipulation operations are performed on a field or form basis by form driver subroutines.

Each form can be user-altered without changing the entire forms structuring program, a spokesman noted.

The package involves two operating systems in its customization, one of which is a subset of the other, he explained. DEC's RT-11 operating system is utilized during the software's development and a runtime version called RT² can be used to actually operate the forms programs.

Three Languages

FMS-11 incorporates all of the VT100 terminal's key features into its forms development routine including reverse video, blink, underline, scrolling and a 132-column display.

FMS programs under DEC's RT-11 operating system can be developed in Basic, Fortran or Macro languages; the amount of memory used by the package varies according to the user's application.

FMS-11's development system license costs $1,350; the system is scheduled for delivery in early 1979 from the company at 146 Main St., Maynard, Mass. 01754.

Obstacles Face Queuing Models

(Continued from Page 33)

ply today.

"Automated instrumentation is an obvious answer but," he lamented, "it is likely to be quite some time before such tools become widely available."

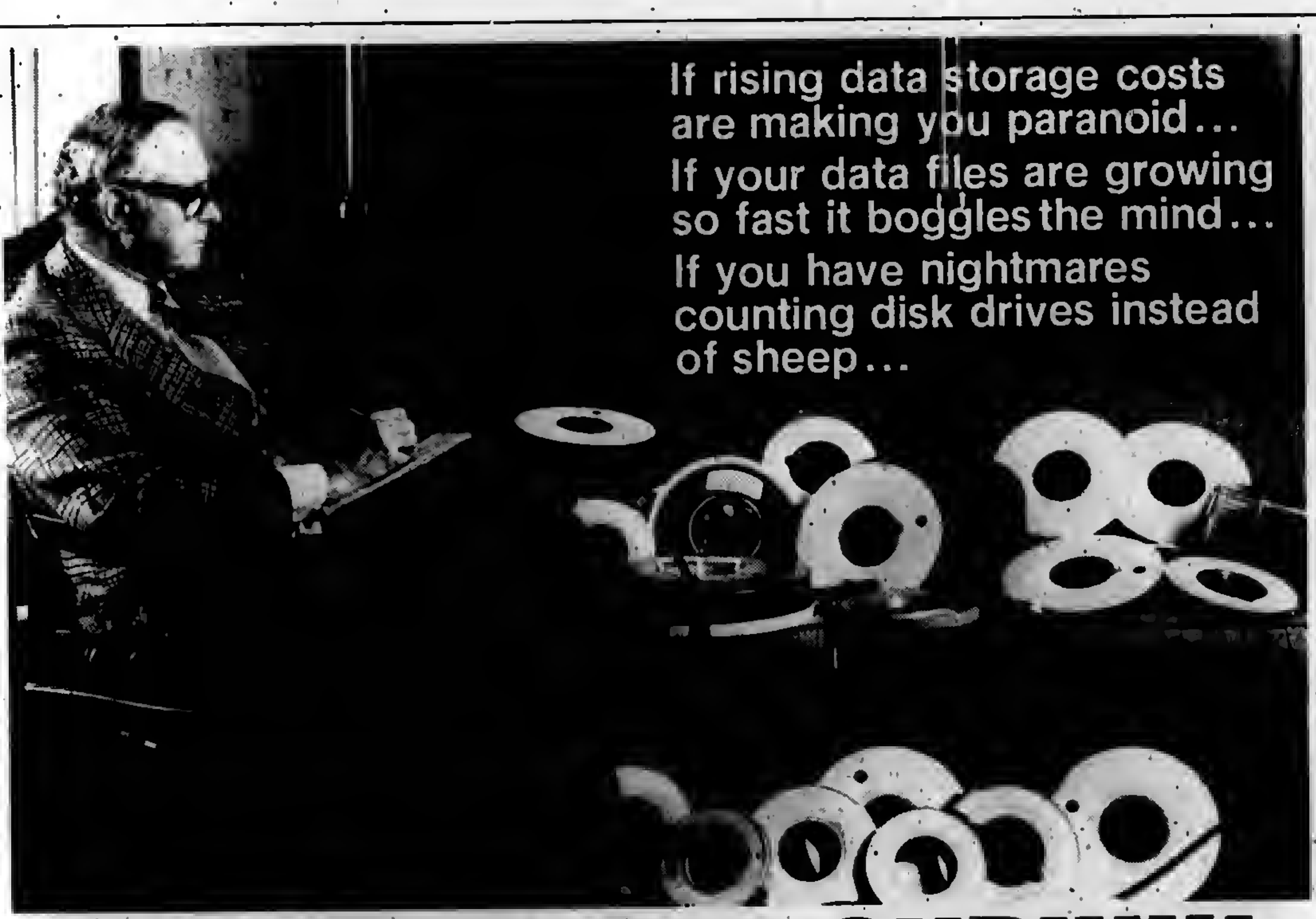
'Rough Going'

Even if good models are available, the challenge of using them effectively can be a major obstacle, the author continued. "The sad fact is, unless you happen to have a recent computer science graduate on your staff who has taken a course or two in queuing theory and computer performance evaluation, you are likely to find your first adventure in queuing models rather rough going."

Queuing theory is quite as difficult as any other topic in advanced mathematics and "unless you feel at home with Markov processes, Lapace transforms and equilibrium state distribution solutions, you may be well advised" to work with one of the packages that have been developed for the nonmathematician, Dunlavey observed.

Having started his article with detailed discussions of some of the queuing models, he ended with comments about some of the packages that are around to help the neophyte.

EDP/PR is published monthly and is available for $48/year or $5/issue from Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.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High Performance Compiler Checks Out Algol

EDMONTON, Alta. — Described as a high-performance compiler that runs on any machine which supports the IBM 370 problem state instruction set and can provide a 1K region of memory, the Full Language Algol 68 Checkout Compiler (Flacc) is now available from Chion Corp.

Flacc was developed in consultation with Dr. Barry Mailloux, one of the authors of the revised Algol 68 report, the language's defining document. The Chion system implements the complete revised language without exception, according to a Chion spokesman.

It includes "all of formatted, unformatted and binary transput, all of the standard preclude, parallel processing, united modes, long and short modes and heap allocations," he explained, adding that these features are omitted from most implementations.

The checkout features include a symbolic dump, a trace function, profile gathering and a traceback of active locales at termination, the spokesman said.

Checks include use of uninitialized or undeclared values, arithmetic overflows, subscripts out of bounds, scope errors and deadlock of parallel processing, he continued.

Operating system independence for Flacc is achieved by gathering all system-related routines into a single module that provides a rigidly defined interface with the user's environment, the Chion source said.

The prerelease version of Flacc has been extensively field-tested in a number of different environments, he claimed. Flacc operating system interfaces are currently available for OS/-VS, MVS and MTS.

The basic checkout compiler system can be leased for 287 Canadian dollars per month; more information is available through P.O. Box 4942, South Edmonton, Edmonton, Alta., Canada T6E 5G8.

Three Programs Converted For Use on Prime Minis

WELLESLEY HILLS, Mass. — Three engineering and scientific programs — described as widely used on mainframes — have been converted to run on Prime Computer, Inc. systems. This is the first time these programs have ever run on a minicomputer, according to Prime.

The Axcess program, first of the converted programs, was authored by the Edison Electric Institute. Used by electric utilities and consultants to perform complex energy audit analyses of building designs to help minimize energy waste, it includes 17,000 lines of Fortran and was converted in three weeks, a spokesman claimed.

HEC2, a 10,000-line Fortran program written by the U.S. Army Corps of Engineers' Hydrologic Engineering Center, is used by civil engineering firms that design and analyze water resource projects throughout the U.S. and Canada. It determines water surface profiles of water systems and is used to estimate flood profiles for rivers or river dam-reservoir systems.

The Storm Water Management Model (SWMM) was created and certified by the U.S. Environmental Protection Agency and used in planning systems to handle overflows of storm water or snow melt in urban areas. It allows engineers to design storm water systems and is in use throughout most of the world, the spokesman said.

This 24,000-line Fortran program was converted to run on Prime equipment in "a matter of days," he claimed.

Users interested in the programs should contact their developers, the spokesman said from Prime headquarters at 40 Walnut St., Wellesley Hills, Mass. 02181.

'Syncsort' Now On Calldata Net

WOODBURY, N.Y. — Users considering the acquisition of Syncsort, the IBM-oriented sort package from Whitlow Computer Systems, Inc., now have the opportunity to test the software through the remote computing facilities of Calldata Systems, Inc., which has just made it available under its TS RJE/Batch service.

The sort is extremely efficient for regular production operations and is not on the Calldata service just for test purposes, a spokesman stressed. He acknowledged, however, that having the software on the network, with its "pay-for-what-you-use" charging scheme, does provide a good environment for evaluation.

As many as 64 separate keys may be specified, and records to be sorted may be of fixed or variable length. Syncsort can handle 14 separate data formats and fields up to 4K bytes long.

Calldata is based at 20 Crossways Park North, Woodbury, N.Y. 11797.

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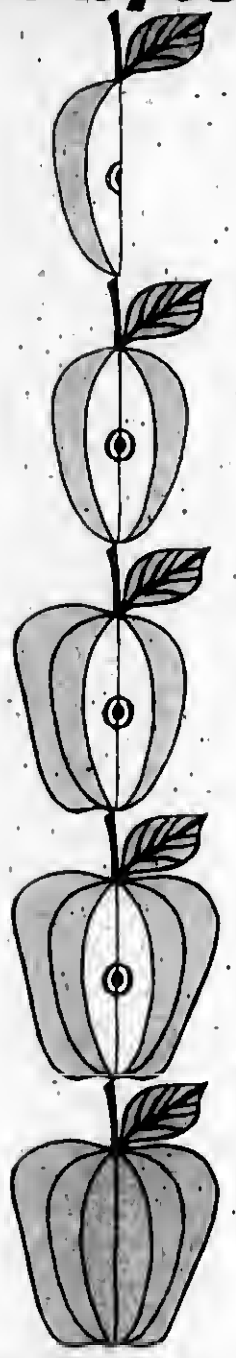

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Longer Zip: Wrong Answer to Right Question

By Stephen L. Robinson

Special to CW

Data Base Corner

Poor Van H. Seagraves. In the Nov. 20 issue, he lamented *Computerworld*'s editorial opposition to the expanded Zip Code. He said he "cannot imagine that a publication covering one of America's most creative and fastest growing industries should focus on programming problems instead of how the computer inudstry can meet this challenge and help the mailing industries reduce cost."

Yes, Mr. Seagraves, we are creative; that is why we are appalled by what is apparently an absurd approach to a legitimate problem. No, we are not focusing only on programming problems; we understand the scope of the complete conversion effort.

Yes, we are interested in meeting challenges, and that is why we speak up with proposals that appear more viable than the solution put forth by the U.S. Postal Service.

Several letters have already appeared in CW and elsewhere offering approaches to achieve the necessary fine division, to the route level, cited by Seagraves. A first obvious approach is the substitution of alphamerics for pure numerics. Optical scanners do quite a nice job on alpha, and the increase from 10^5 to 36^5 combinations would certainly be substantial.

If that is not enough, why not consider a 7-character code formed by concentrating the now-standard 2-character state codes to a revised 5-character alphameric code? As it is, we have an unnecessary redundancy between the city and state fields and the geographic indicators of the Zip Code.

Such a change would yield 50 times 36^5 combinations, which should keep the post office happy for a while. Also, the total cost to effect this change (most likely only a formatting change in output lines) would be substantially less than the cost of a 9-character code.

Speaking of costs, has the post office computed the total cost of this boondoggle? A quick guess tells me that my name and addess appears in *at least* 50 files. I imagine the total number is quite a bit larger.

A hundred or more would not surprise me (if you don't believe this number, add up all your subscriptions, credit cards, bank accounts and mortgage statements and junk mail which arrive in a month).

But let's be charitable. Suppose the national average is only 25. There are some 200 million people in this country, which projects to five billion address changes.

To estimate the cost of such changes, we should include analyst, consultant and programmer time; computer time; the cost of acquiring new forms; and the cost of misprocessed mail as a result of "learning" errors of the new codes.

If the cost averages out to less than $1 per change, I would be surprised. (This does not, of course, include the "annoyance" cost to the public of dealing with the new code.)

What Benefits?

So we are talking about a potential cost of perhaps $5 billion (staggering, is it not?). To be fair, we should look at the other side of the coin, the "benefits" side.

Will our mail be delivered faster? Will the cost of a letter go down? Will the cost of a letter remain the same? Will the cost of the letter rise more slowly than in the previous 10 years, which has seen the meteoric rise to 15 cents?

I believe that most of the data processing community agrees the answer to all the questions above is "no." That is why we do not approve of the nine-digit proposal. Not because we are not interested — we are; not because we don't understand — but because we do; not because we don't want to help — we would like to.

Robinson is an independent consultant operating as S.L. Robinson & Associates, Morrisville, Pa.

Wang Users Offered Accounting Packages

HOLLYWOOD, Fla. — Four accounting packages designed to run on Wang Laboratories, Inc.'s WCS 20 or WCS 30 systems are now available from National Software Marketing, Inc. The current selections include payroll, accounts receivable, accounts payable and general ledger accounting.

Each system is supplied on three floppy disks. One floppy is already initialized for the files "so you can just drop in the disks and the systems are ready to run," a spokesman said.

Described as tested systems that required hundreds of hours of development, each package costs $200 plus $10 for handling and media. They can be ordered from the vendor at 4701 McKinley St., Hollywood, Fla. 33021.

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The NCR V-8600 systems are ideally suited for large online multiprogramming applications that take full advantage of virtual memory. Both systems offer VRX (Virtual Resource Executive), NCR's most sophisticated operating system software. Both use TRAN-PRO, NCR's transaction processing software to interface readily with a communications network. Both use TOTAL to manage a data base. And both mesh easily with NCR's Distributed Network Architecture.

For a personal introduction to NCR's V-8650 and V-8670, call your local NCR representative. Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

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Development Aided

WELLESLEY, Mass. — An interactive system for on-line program development and word processing, Interact is now available from Cullinane Corp. for IBM-oriented installations.

Described as a renamed Release 6.0 of Mentext, which Cullinane took over when it acquired California-based Mentel, Inc. recently, Interact is said to provide powerful, easy-to-use word processing features that include text editing and automatic formatting.

Interact is compatible with IBM 360s and 370s and supports IBM 3270, 2741 and teletypewriter-compatible terminals. It is currently available for OS or OS/VS users.

The current version costs $25,000, Cullinane said from 20 William St., Wellesley, Mass. 02181.

Runtime Library Included

Series/1 Gets Cobol Compiler

NEW YORK — Users of IBM's Series/1 minicomputer can now acquire a Cobol compiler and runtime library support system, developed by California-based Royal International Systems, from DDP Products, Inc.

The Series/1 Cobol System is said to be a complete package that allows the user to compile and execute Cobol programs conforming to Level 2 of the ANS Cobol 74 specifications. Validation of the system's conformance with Federal Information Processing Standards can also be provided, a spokesman added.

Written in an interpretive instruction set and utilizing the stack capabilities of the Series/1, the compiler is capable of processing a Cobol source program in a minimum Real-Time Programming System (RPS) user partition, he claimed.

Output Listings

Output includes listings of both source and object code, error diagnostics, data and procedure maps and a cross-reference list.

The reentrant modules of the runtime library perform the I/O, data manipulation, arithmetic, table-handling and debug functions required by the executing program. The routines utilize the task work-stack for linkage and local variable storage, the spokesman noted.

The complete Series/1 Cobol system requires a 64K-byte 4953 or 4955 processor with disk or diskette units, a printer and an operator station. Software prerequisites include RPS V1.1, the Program Preparation Subsystem and support for the Indexed Access Method, if indexed files are needed.

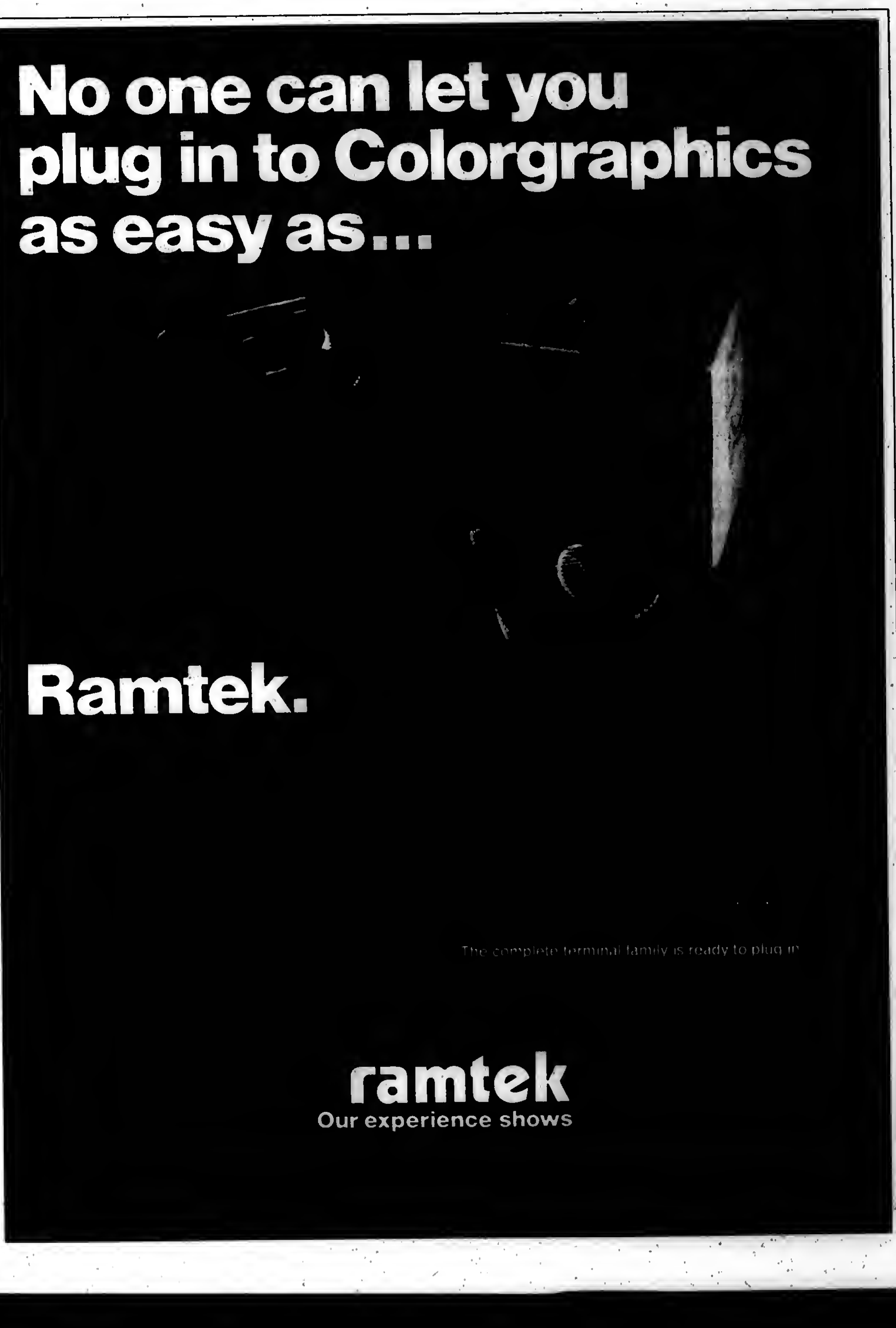
The complete package, including the compiler, costs $9,500 or $750/mo. An "executive" version, excluding compiler, costs $3,900 or $375/mo, the spokesman said from DDP Products at 31 E. 28th St., New York, N.Y. 10016.

DMC Unveils Pascal Compiler For Commfile130

SANTA CLARA, Calif. — A Pascal compiler, now available for use on DMC's Commfile microcomputer floppy disk system, is said to be a "simple and straightforward . . . standardized" implementation of the language as defined by Wirth's "Pascal User Manual and Report."

This compiler runs under DMC's disk operating system. Pascal source code is loaded onto the Commfile's floppy disk using the standard Editor, after which the compiler produces object code which is executable on 8080 or Z80 microprocessors, a spokesman explained.

The compiler is available to Commfile users for a license fee of $500, he said from the offices of DMC, a division of Cetec Corp., at 2300 Owen St., Santa Clara, Calif. 95051.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Crane Developer Scoops Up Manpower, Dollar Savings With Data Control System

Special to CW

SHADY GROVE, Pa. — When a rapid growth company attracts increasing competition, it cannot maintain a position of leadership without effectively reducing waste in manpower usage and high-cost inventories. These objectives were attacked at Grove Manufacturing Co. here with the implementation of a computerized data control system.

Ten years ago Grove had some $32 million in sales. Today annual sales are approaching $300 million.

As a specialist in its field, Grove has been the innovator in designing and developing self-propelled cranes with hydraulically telescoping booms. It has managed to capture a substantial corner of the world mobile crane market by fending off aggressive competitors.

To combat increasing manufacturing and marketing costs, five years ago Grove's management approved the installation and implementation of the Manufacturing Control System (MCS), designed to automate eight major facets of the total operation — sales forecasting; engineering data control, inventory control, requirements planning, purchasing, capacity planning, operation scheduling and shop floor control.

For 10 years prior to 1978, just to keep pace with burgeoning growth, Grove's management services department had gone through five separate upgrades in computer systems resulting in its present back-to-back IBM 370 systems, a Model 135 and a Model 138.

Terminal Network

Management services proceeded to implement the present MCS by installing Cincom Systems, Inc.'s Total data base management system (DBMS). Cincom's Environ 1 was added to support a network of teleprocessing terminals for DBMS inquiry and a real-time customer service system consisting of order entry, inventory control, warehouse control and invoicing.

Currently the system supports remote job entry (RJE) from Conway, S.C., with the DBMS and RJE from the engineering department for design calculations utilizing IBM's Conversational Monitor System (CMS). To cope with future requirements, Grove is preparing to implement a tie-in so its subsidiary company in the UK can access the CBMS here via satellite.

After five years' experience with the system, J. Martin Benchoff, president and chief executive officer, said the benefits accruing from the DBMS have been gratifying.

"While the new materials requirements planning [MRP] through DBMS has been very successful, the real motivation in making the change was to improve the bottom line," he noted, adding savings have been realized in every major segment of the DBMS setup.

For example, data-controlled sales forecasting and pursuit of marketing objectives have supported whole goods sales increases of 110% between 1973 and 1978.

Joe Palkovitz, director of material control, said, "Because of a steady introduction of crane models to cope with market requirements, which contributed to a 65% increase in the number of inventory items just within the past three years, MRP and DBMS have allowed an inventory reduction of 17% in actual dollars."

That cost savings is remarkable, considering the 21% inflation rate Grove inventory experienced during 1975 to 1978. If that factor is backed out, overall inventory dollar reduction reaches 34%.

(Continued on Page 44)

Booklet Describes Software That Analyzes CMS

SPRINGFIELD, Va. — A booklet describing software for analyzing interactive Conversational Monitor System (CMS) performance may deserve attention despite its limited, 24-page size because both its authors are from IBM's Research Lab at Yorktown Heights, N.Y.

The software, called Stream Analysis of Responses by Category (Starcat), is said to analyze sequences of user command strings that have been captured in a special time-stamping CMS console file.

System response times are associated with each string; strings are assigned — by command name, environment or experimenter-chosen groupings — into categories; and category statistics are reported for one-, two- and three-string subsequences.

Starcat is said to provide a new tool for the quantitative analysis of interactive terminal performance.

Written by Roger C. Evans and Lance A. Miller, "Starcat, a System to Analyze Interactive CMS Performance" is cataloged by the National Technical Information Service (NTIS) as item AD-AO56 835/2WC. It costs $4 in paper format or $3 on microfiche from NTIS at 5285 Port Royal Road, Springfield, Va. 22161.

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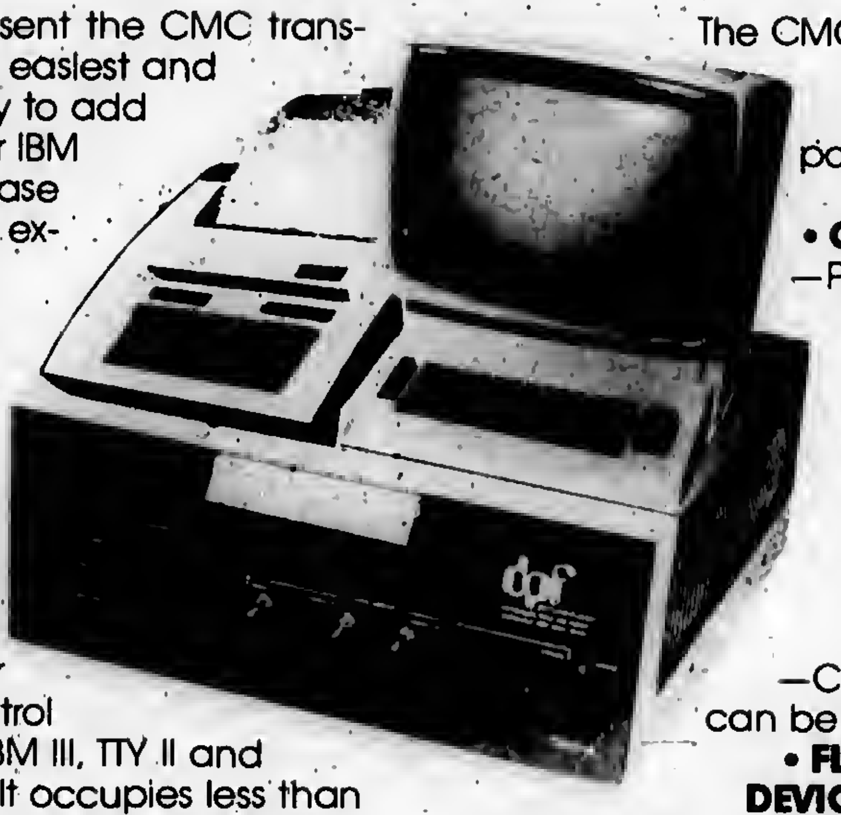

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Firm Scoops Up Savings With Data Control

(Continued from Page 43)

Direct cost and operating savings experienced at Grove Manufacturing and attributable to the MRP application and the DBMS are:

- A reduction of 100 people compared with '75.
- A 75% reduction in shortages of manufactured line items.
- A 90% reduction in shortages of purchased line items.
- Improved efficiency in inventory cycle counts through a reduction in errors.
- A 50% reduction in open manufactured item orders.
- A 19% reduction in the volume of purchase orders.
- A 66% reduction in change notices.

John J. Weber, director of management services, verified that "if Grove management services staffers had *not* implemented the computerized DBMS, using Cincom's Total Environ 1 software packages, the two major users of the system, materials control and customer services, would have required a combined staff increase of approximately 160 people — representing a monumental outlay in additional payroll and fringe benefit costs."

John Jacobus, director of customer service, noted that, "to achieve the current 92% delivery factor in off-the-shelf crane service parts plus the 283% increase in line items delivered to the field today, Grove's customer services department would have had to hire 73 additional people if it had not had use of the system."

Other Benefits

Parts and service benefits have emerged as well. Since implementation of the computerized parts control system, delinquent parts orders have been cut from 31% to 15% in five years.

Grove greatly improved customer relations relative to parts shipments. To a construction contractor, equipment availability means profit, and if a manufacturer can help him cut downtime to a minimum and get his equipment back to work, he's happy.

Another point of interest is that five years ago, capacity planning at Grove was almost nonexistent. But then a rapid rate of sales growth and an almost continuous expansion of production facilities to meet demand took place.

Capacity requirements planning was developed and interfaced with MRP. This was necessary to determine load vs. capacity conditions at each work center, to keep work loads at reasonable levels and to spot potential overloads that might require either subcontracting or installation of production equipment and facilities.

More Savings

Prior to the system's implementation manually calculated figures could be delayed up to eight days. Now the situation throughout the production operation is analyzed by computer, and a condition report is usable the same day it's generated.

While the DBMS was delivering all these cost savings and vastly improving its efficiency, management services' DP costs went up only .1% over the five-year period. Total costs today are reportedly well below national averages for similar installations.

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But if you were to ask these people today if they regretted moving into marketing, the answer would be an unequivocal "no." They haven't diminished their expertise, they've greatly expanded it. In a single year, most of them have done performance evaluations and fine-tuning inside 60 to 70 major centers, working with virtually every IBM system. And that may be better than any advanced degree!

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CUPERTINO, Calif. — Since switching from an outside service firm that handled sales orders and prepared prospect quotes to a combination of a packet network service and an in-house preprocessor about 10 months ago, Fairchild Camera and Instrument Corp. has slashed its communications and preprocessing costs for these applications by 70%.

Instead of getting a monthly bill from the outside service firm for $40,000 to $45,000, Fairchild now spends only about $12,500 a month for the same service — $6,500 to have Tymnet, Inc. handle the heavy communications involved in processing sales orders and price quotes and $6,000 to perform the necessary data editing and validation in-house on a Computer Automation, Inc. Syfa processor.

"We're getting everything we had before plus the added benefit of being able to implement a standardized approach for both the domestic and international sales order entry process," according to William Brasuell, Fairchild's worldwide telecommunications manager.

Dan Perry, systems manager for Fairchild's marketing distributed processing, said that from an operational standpoint, Tymnet saved his life. "I no longer have to worry about proper network functioning or reliability," he explained.

Objective Set

In mid-1977, Fairchild set cost reduction in communications as a primary objective. Perry suggested going in-house to perform the preprocessing for order entry and finished quotes as a first step toward reducing costs.

Brasuell then began researching the communications requirements of this approach and undertook an in-depth study of possible alternatives to the costly outside packaged service. He brought in Dr. Dixon Doll, president of DMW Telecommunications Corp., an independent telecommunications and management information research firm, to perform a comparative analysis of the options.

Doll recommended that Fairchild switch to a pure communications service for the heavy transmission volume related to order entry and customer quotes provision, and DMW's analysis showed that public data communications networks offered the greatest econ-

(Continued on Page 46)

Railroad Unloads Paper Burden By Taking on Trio of Terminals

MIAMI — A trio of remote terminals has taken over the job of preparing invoices and other time-consuming documentation at a busy East Coast railway, thereby eliminating the need for additional manpower to cope with a growing paperwork burden.

In recent years, escalating rail traffic to the South has provided an expanding business base for the Florida East Coast Railway (FECR), whose primary routes stretch from Jacksonville in northern Florida to Miami and surrounding suburbs in southern Florida.

The line's success has not been without its problems, however. The additional traffic strained the capacity of local railroad stations to keep up with the paperwork needed to keep track of hundreds of railway cars entering the track "pipeline" every day. In the Miami area, in particular, "piggyback" traffic — trailers on flatcars — reached the point where, according to Carl Zellers, FECR vice-president, "if we hadn't done something to speed up the preparation of paperwork, we would have had to put on additional clerks to handle the load — and this is manpower that costs about $18,000 a year for each clerk when benefits are included."

This prospect was eliminated with the installation of three Raytheon Data Systems Co. PTS-100 CRT terminals and associated peripherals at two of FECR's Miami operations. Tied into the line's IBM System 3 Model 15 mainframe in Jacksonville, the terminals emulate IBM 3270 equipment, communicating with the System 3 at 4,800 bit/sec over private lines.

The terminals prepare bills (which are printed on a companion matrix printer) for same-day delivery to customers after a shipment is completed; prepare master lists of each train departing from Jacksonville and due for arrival in Miami; and handle customer inquiries regarding shipment progress.

Before the terminals were tied into the line's Jacksonville mainframe, these tasks

(Continued on Page 46)

Former FCC Chief to Keynote Communications Networks '79

WASHINGTON, D.C. — The Communications Networks '79 conference will be held Jan. 30- Feb. 1 at the Sheraton Park Hotel here and will feature a keynote address by Richard E. Wiley, former chairman of the Federal Communications Commission (FCC).

Sharing the keynote platform with Wiley will be Prof. Anthony Oettinger of Harvard University, Dr. Dixon R. Doll, president of DMW Telecommunications Corp., and Jack Epstein of Booz, Allen & Hamilton.

A session dealing with proposed revisions to the Communications Act of 1934 will feature Walter Hinchman, former chief of the FCC's Common Carrier Bureau, Harry M. Shooshan, chief counsel of the House of Representatives Subcommittee on Communications, William Sharwell, a vice-president of AT&T, and A.G.W. (Jack) Biddle of the Computer & Communications Industry Association.

Other speakers will include Dr. Howard Frank, president of Network Analysis Corp., who will discuss network strategy, and John Gantz of International Data Corp., who will speak on distributed data processing concepts.

The conference will include 60 sessions and workshops plus an exhibition of products and services. Details are available from The Conference Company, 60 Austin St., Newton, Mass. 02160.

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multiplexers

Railway Takes on CRTs, Unloads Paperwork

(Continued from Page 45)

were handled manually by clerks at the Miami stations. A number of separate steps were involved, as Zeller explained:

"When a train arrived in Miami, clerks would sit down at a typewriter and prepare a bill for freight charges for a particular customer's shipment, based on its weight, classification and so on, then add a drayage charge for delivery of an off-loaded trailer from our terminal ramp to the customer's plant.

"The data needed to prepare bills came from files at the Miami stations, so clerks spent much of their time looking up paper files. We knew this was inefficient but, what was worse, extensive manual handling was clogging data entry up at the Jacksonville mainframe.

"Clerks had to mail copies of completed bills to Jacksonville for keypunching into the mainframe. Because of mail delays, consignees sometimes mailed payment for bills before the billing transaction was entered into the computer's accounts receivable program, which created obvious problems with recordkeeping.

"Furthermore, manual errors originating at Miami railroad stations and keypunching errors, such as transposed digits, led to errors in the computation of the waybill, the transportation document that travels with the shipment."

Communications Snarl

Other documents and data besides consignee charges were snarled by poor communications from Miami to Jacksonville.

For example, the "train consist" — a master list describing each car on a single train, including its order, weight and trailer load — was previously available only in Jacksonville. With the terminals, however, the "train consist" can be transmitted within a few seconds to Miami.

"Our Miami terminal now knows exactly what trains will be arriving, exactly what trailers they're carrying and when they are expected to arrive. This kind of advance information can be passed along to consignees, obviously providing better service, but also eliminating tedious phone calls that were once required to keep track of train movement into local stations," Zeller said.

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Computer Associates, an internationally known software company, is seeking qualified individuals for positions throughout the United States.

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User Saves 70% by Moving From Service to Packet Net

(Continued from Page 45)

omy. From these networks, Fairchild chose Tymnet because of its low cost and its ability to meet requirements that went beyond the cost factor, Brasuell said.

Tymnet's projected $7,000 to $8,000 monthly cost was less than half the $20,000 estimate for leased lines and even less than the $11,000 to $12,000 estimate for Wats service, which convinced Fairchild of the economy of public packet service.

Fairchild also was attracted by Tymnet's expanding 1,200 bit/sec service, geographic coverage, access to Canadian cities through its interconnection to the Datapac network and its links to international locations via the international record carriers' Tymnet connections.

Strict Requirements

Fairchild's requirements included total terminal flexibility, complete vendor management of network facilities and the error checking, retransmission and rerouting features of a value-added network, Brasuell noted.

"No other network met all of Fairchild's wide-ranging requirements," he said. "We also became convinced that Tymnet personnel could best meet our strict requirements for responsive and reliable support."

Once the decision to use Tymnet was made, installation was rapid. "Our interface to Tymnet — an eight-port asynchronous Tymcom CP8A — took about half a day to install, which was unbelievable," Brasuell said.

After the in-house development was complete, the entire switchover of the sales order entry system took about one month and was transparent to the users. "We simply substituted a different phone number to call and advised users of a new log-on procedure," he recalled.

Since converting to the network in November 1977, Fairchild has doubled its Tymnet ports, upgrading from the Tymcom CP8A interface to a 16-port machine last February. In addition, Fairchild has a pending upgrade from the Tymcom to a 30-port interface communicating with two hosts.

Order Entry System

Fairchild's sales orders are received at Mountain View, Calif., for processing from nearly 85 sales offices, independent representatives and distributors in the U.S. and Canada. Orders are filled and shipped worldwide from Fairchild's Far East factories and warehouses.

The company processes international sales orders by a different method from that used for domestic order entry, employing separate computers in Milan, Munich, London and Paris.

In Fairchild's order entry system, a sales office interactively creates an order using Tymnet to access the Syfa processor. The CPU validates the order by ensuring that all information about the customer and the product is correct.

Sequenced, edited orders are shipped into the sales backlog on Fairchild's IBM 370/168 for verification daily. The 370 updates the Syfa's customer master and backlog files daily and updates the product master file weekly.

Quote System

In the finished quotes system, a salesman with a potential order calls in a request for price and delivery quotes. For any given product, the marketing and production control offices are often geographically separate. They enter the price and delivery quotes, respectively, into the system and the Syfa CPU assigns a quote number.

When the order is entered, the sales representative references this quote number. Then the order is scheduled and the price is automatically validated.

Fairchild is about to add Tymnet access to VM on its IBM 370/158 for engineering applications. To interface this application, the company is considering adding another eight-port asynchronous Tymcom interface with up to 1,200 bit/sec capability, a Tymcom CP8A/1200.

Fairchild also is considering interfacing Tymnet to IBM's Time Sharing Option on its 370/168 for business programming and may either upgrade the second Tymcom to 16 ports or replace it with a synchronous interface.

"The Tymnet service is super. We are very pleased, and our cost projections are right on target," Brasuell said.

"Our service has been 99%-plus reliable, and I've had extremely good response from the Tymnet support staff," Perry concluded.

Video 200 Gets Buffer

MAHWAH, N.J. — A microprocessor-based version of the Video 200 CRT with a magnetic tape cassette buffer that produces formatted data is now being offered by Western Union (WU) Data Services.

Complete formats consisting of a line drawing and 16 different types of display attributes can be displayed on the Video 200's screen by the cassette buffer.

The cassette buffer has a storage capacity of 50,000 characters and transmits at 1,200 bit/sec.

With up to three pages of memory, the Video 200 can store 75-line forms with 80 char./line by scrolling up and down. Editing features include insertion or deletion of a character or a line and erasure of a full page or field.

On a three-year lease, prices for the Video 200 with cassette buffer begin at $161/mo including maintenance. WU Data Services is at 70 McKee Drive, Mahwah, N.J. 07430.

Datamedia Reduces Prices, Extends Elite's Warranty

PENNSAUKEN, N.J. — Datamedia Corp. has announced price reductions of 4% to 12% on models of its Elite CRT terminal line.

At the same time, the factory warranty was extended to one year from 90 days and an optional second year of warranty was made available for $100 at time of purchase.

The Elite 3000A microprocessor-based CRT series offers several buffered terminal models with editing; multiple-level, protected formats; APL character sets; Digital Equipment Corp. VT-52 compatibility; and advanced printer control features. Its costs range from $1,595 to $1,795 for a single unit.

The Elite 1521A is a full-featured character-interactive CRT with detached keyboard, cursor addressing and printer control; it now costs $1,250.

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For central computer sites we offer Racal-Vadic's Multiple Data Set. Up to forty-eight assorted modems fit in a single seven-foot rack, with displays and diagnostics that make it simple to troubleshoot the entire data network.

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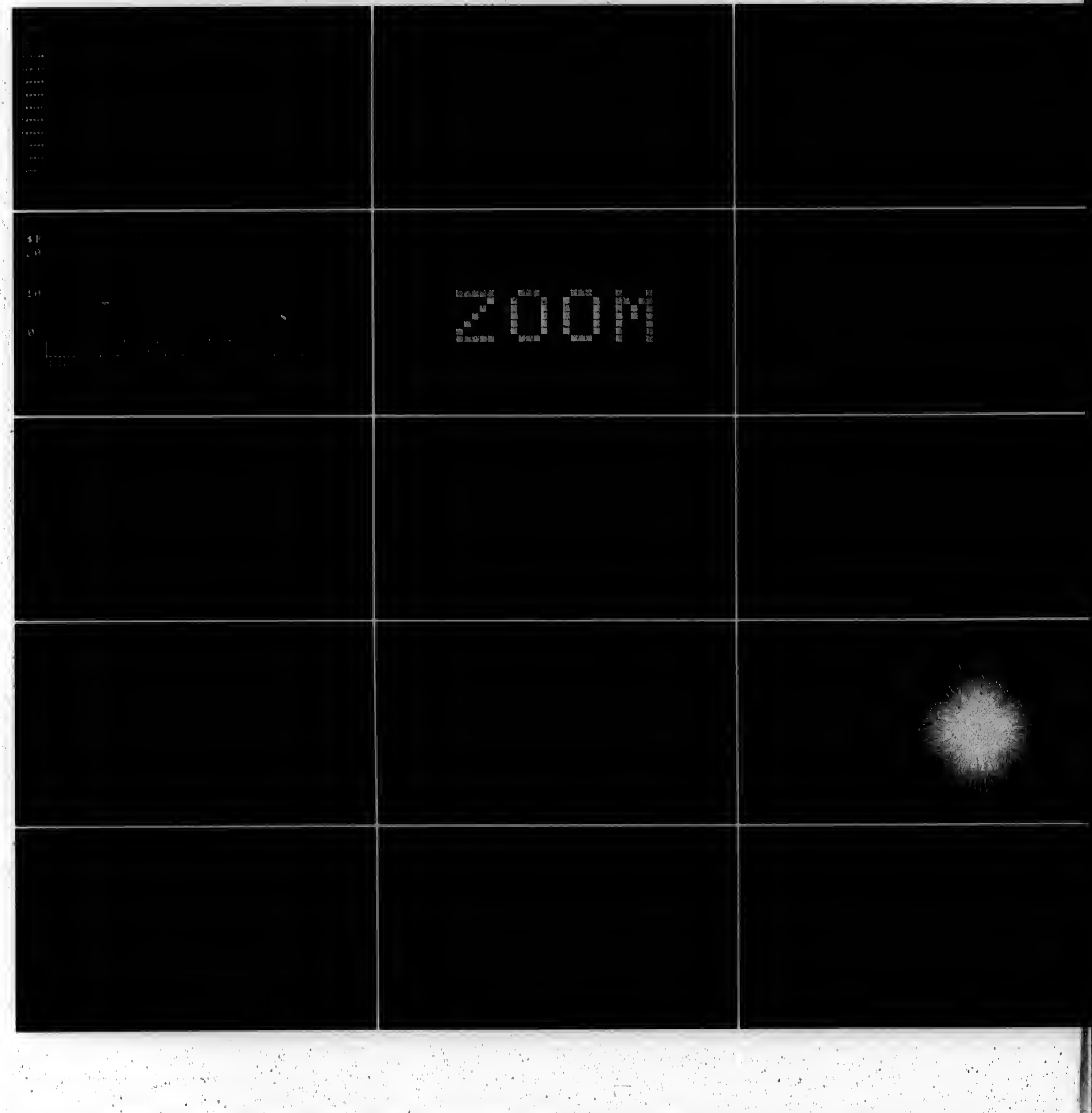


graphics software.

You just lost your last excuse for sticking with alphanumerics. Because with HP's new 2647A Intelligent Graphics Terminal, you get graphics without digging into your CPU's software.

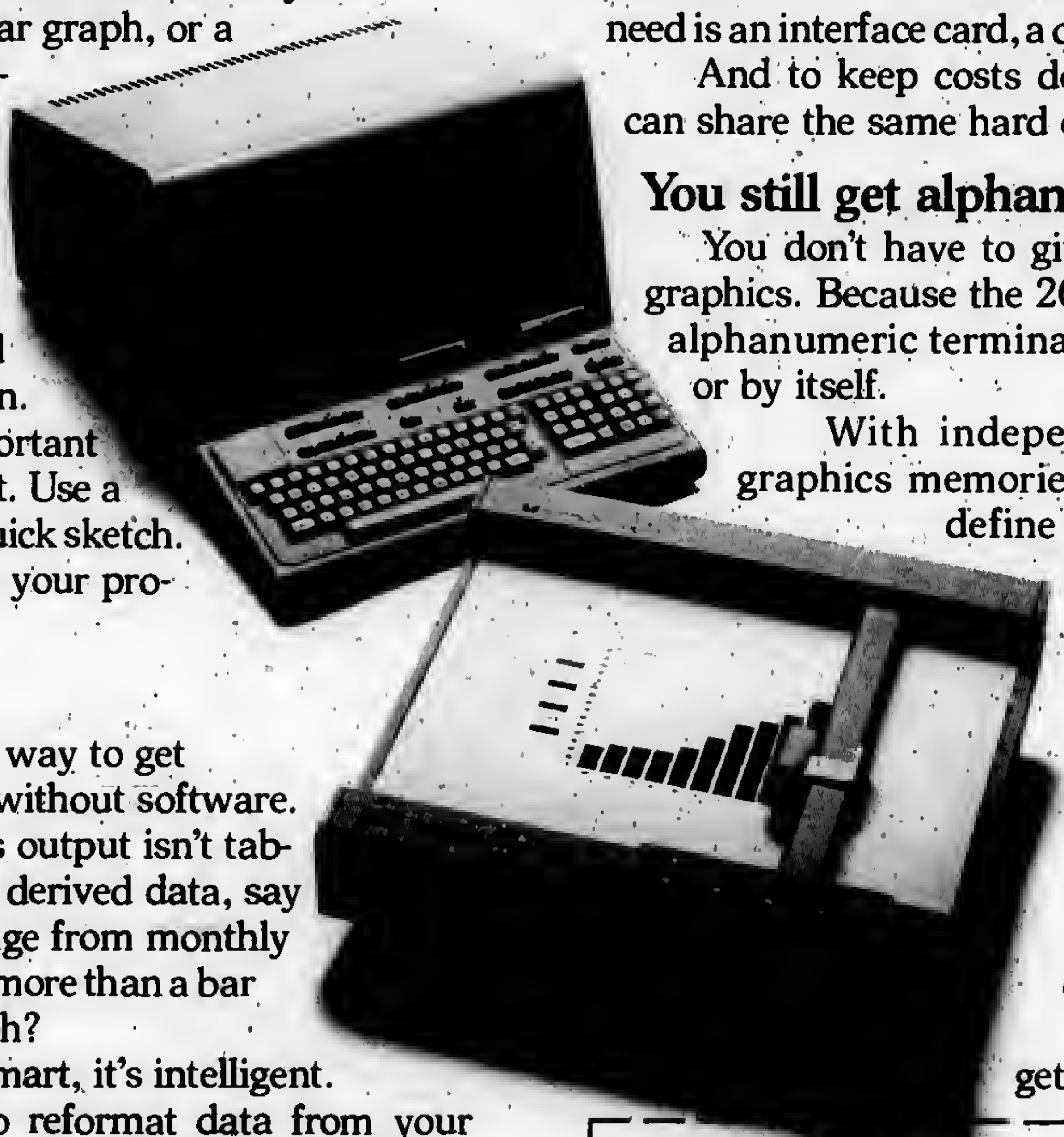
A picture's worth a thousand numbers.

On an alphanumeric terminal, your data's just a screen full of numbers. But with the 2647A you can plot tabular data as a bar graph, or a pie chart, or a linear or logarithmic line graph. Quickly, with just a few keystrokes.

Now you can really see your data, not just look at it.

What's more, with the 2647A you can zoom in and out. Pan right, left, up, down. Selectively erase. Shade important areas to make them stand out. Use a rubber-band line to make a quick sketch.

Without any help from your programming department.



It's more than smart.

The 2647A's the smart way to get graphics from tabular data without software.

But what if your CPU's output isn't tabular? Or if you'd like to plot derived data, say a three-month moving average from monthly sales figures? Or if you need more than a bar graph, pie chart or line graph?

The 2647A's not just smart, it's intelligent.

You can program it to reformat data from your CPU, or to compute more data, in easy-to-write BASIC. And you can program it in AGL, our high-level graphics language extension of BASIC. Its powerful commands, such as FRAME, AXES, LABEL, LOCATE and PLOT, put sophisticated graphics at your fingertips.

Either way, your program runs on the 2647A without any help from your CPU.

Hard copy's easy.

How do you get graphics into your briefcase?

The 2647A makes graphics as portable as alphanumerics. It interfaces easily with our 9872A Four-Color Plotter (which can even make overhead transparencies), and with our 7245A Thermal Plotter-Printer. All you need is an interface card, a cable and the peripheral itself.

And to keep costs down, more than one 2647A can share the same hard copy peripheral.

You still get alphanumerics.

You don't have to give up alphanumerics to get graphics. Because the 2647A's also a programmable alphanumeric terminal for interactive use on-line or by itself.

With independent alphanumeric and graphics memories. Eight soft keys you can define to do several steps with a single keystroke. A bright, easy-to-use, high resolution display. And built-in dual cartridge tape drives for 220K bytes of mass storage.

Best of all, the 2647A with full memory and data communications interface costs only $8300.*

Which makes it easy to get the picture.

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Asynchronous Units Linked With 3780-Based CPUs

CAMBRIDGE, Mass. — A standardized interface unit for use between asynchronous devices and host computers supporting the IBM 3780 protocol is available from Industrial Computer Controls, Inc.

The CA12-SIU/3780 is a Z-80 microprocessor-based unit that lets a user interface a wide range of asynchronous devices to a processor supporting the IBM 3780 communications protocol, according to a spokesman.

Available with up to 32K bytes of buffer memory, the standardized unit operates on 2A, 117 Vac, 60Hz and requires no user expertise.

When not performing its data communications function, the CA12-SIU/3780 can conduct a self-test. It can also be remotely tested over phone lines by means of a modem.

Options for the unit include rack mounting, additional memory and changes in communications capabilities (transparent or nontransparent, Ascii or Ebcdic).

The CA12-SIU/3780 is priced at $3,080 from Industrial Computer Controls, 400 Memorial Drive, Cambridge, Mass. 02139.

DG Users Gain 3270 Support

MEMPHIS, Tenn. — Data Communication Corp.'s Unique TPS-3270 Combo software package reportedly allows IBM 3270 emulation and transaction processing to run concurrently on any mapped Data General Corp. processor. It will support up to 32 CRTs and a variety of other peripherals with total device independence, the vendor said.

The package gives CRT users the ability to switch from transaction processing to 3270 emulation by a single keystroke, a spokesman noted.

The Unique 3270 is a full implementation of all 3270 features which can be supported on an IBM mainframe plus concurrent local printing at speeds up to 1,100 line/min.

The Unique Transaction Processing System is a stand-alone, real-time system. It includes foreground/background control structure for multiple program execution.

The Unique TPS-3270 is available now for "under $20,000" for the complete software package and "under $10,00" if purchased with hardware. The 3270 software alone is $4,000 or $2,000 if purchased with hardware, the spokesman said from 3000 Directors Row, Memphis, Tenn. 38131.

Bridging Switch Monitors Data Between Sites

LINCOLN, R.I. — International Data Sciences, Inc. (IDS) has introduced the Model 570, designed for online monitoring of data between remote sites.

The Model 570 is installed on-line between two modem repeaters at their digital interface. The unit alows for online monitoring of data and timing in both directions.

The unit is capable of operating with modems which have any one of three signal interfaces — CCITT V.24 (EIA RS-232C), Bell 303 and CCITT V.35, according to a spokesman. LEDs monitor the TC, SCR, RD and SCTE signals at these interfaces.

The interface signals of the Model 570 to the data test set are CCITT V.24, he added.

Operational Modes

The Model 570's modes of operation include Bridge and Terminate as selected by a key-lock switch or remote control and an automatic bypass mode which will not affect throughput during any M570 failure condition.

Modems may be internally timed or use timing supplied by the Model 570 at 50 KHz or 56 KHz.

The Model 570 is priced at $2,800. IDS is at 7 Wellington Road, Lincoln, R.I. 02865.

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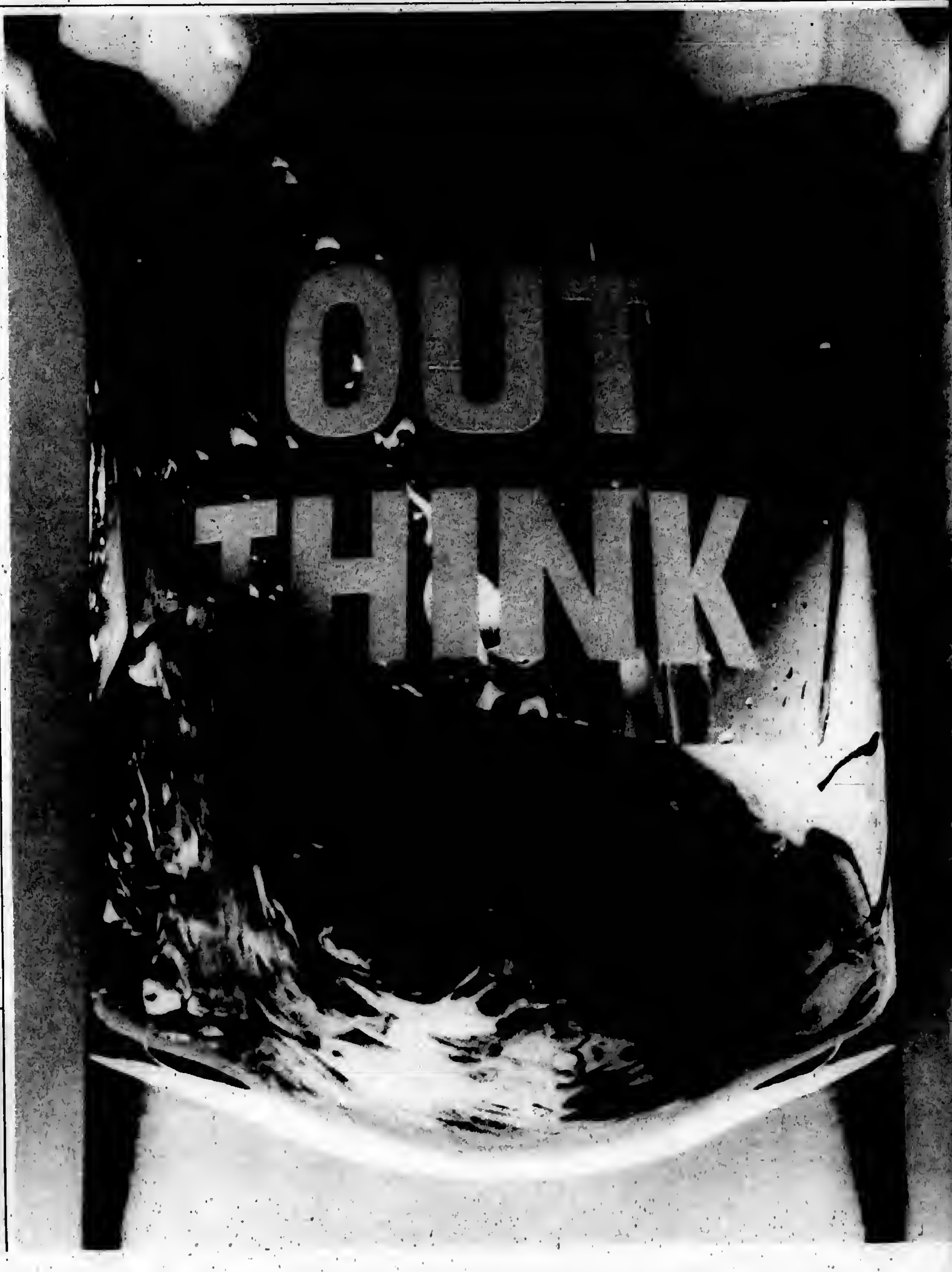


IBM Adds Programmable 3653 POS Terminal

WHITE PLAINS, N.Y. — IBM has introduced a programmable version of the Model 3653 point-of-sale (POS) terminal for the retail store environment that can provide managers with the capability to add functions and increase control of sales and nonsales applications.

The 3653 programmable terminal, operating with IBM's Model 3651 programmable store controller, can be programmed to perform a variety of POS functions. For example, retailers can change the sequence of functions, check prices in the terminal, collect new information and customize sales slips.

The system also can be programmed for special functions such as layaway, COD transactions, special discounts, currency conversions and service desk operations — including check cashing, check or credit approval and payments, IBM said.

Three IBM program products for retail customers have been announced for use with the programmable 3653. They are:

- Point-Of-Sale Application/Retail Environment, which provides the basic functions needed to control both sales and nonsales applications in a retail store;
- Point-Of-Sale Application/Store Data Management, which can be used to build and maintain files in a retail store and for direct store-to-store communications between controllers in chain store operations.
- Subsystem Program Preparation Support III, which gives store programmers the capability of writing programs to run in the store controller or in the POS terminals to provide terminal functions, report generation and conversational applications.

Presently installed IBM 3653 POS terminals at store locations can be upgraded to the programmable terminals for $425. Installed terminals and programmable terminals can be operated by the same 3651 programmable controller, IBM said.

The 3653 Model 1P terminal, which is scheduled for delivery in the second quarter of 1979, can be purchased for $4,090 or leased on a five-year contract for $106/mo.

The Point-of-Sale Application/Retail Environment program product can be licensed for $60/mo for each 3651 controller, and the Store Data Management program can be licensed for $15/mo per controller. The Subsystem Program Preparation Support III program product can be licensed for $260/mo for each host 370 mainframe.

Interface Links Three Printers

FAIRFAX, Va. — Air Land Systems Corp. has unveiled a microprocessor interface called the MPC-15 designed to provide serial data interface for the Dataproducts Corp. 2230, 2260 and 2290 printers over communications lines that have complex protocols.

To accommodate the data rate of these high-speed printers, the MPC-15 uses a 128-character memory which can be accessed by the printer at its own rate, up to 500 kHz.

The system costs approximately $1,000 in quantities of 100 or more from Air Land Systems Corp., 2820 Dorr Ave., Fairfax, Va. 22031

Liquids, the most adaptable of all matter, shape themselves exactly to fit their containers.

In much the same way, a Datapoint ARC™ system adapts itself to fit the needs of a business.

In this day when competitive edges are frequently slight and often difficult to come by, you have to out-think your competition to gain an advantage. The Attached Resource Computer system can help by putting powerful data processing capability at the hands of those who need it most, wherever they are in the company.

Not just another network

An Attached Resource Computer system is an arbitrary number of small, powerful, inexpensive computers, each performing its assigned tasks independently, yet all are totally interconnected to share common resources and draw from a common database. For high reliability, the system is composed of proven Datapoint processors and peripherals.

One of the ARC system's strengths is its specialization of components. One or more processor in each system is dedicated to file processing and management. The others are applications processors. Internal communications are achieved by an Interprocessor Bus, using dedicated Resource Interface Modules (RIMs).

This capability frees a computer from juggling all three functions. Consequently, processing can be carried out at much higher throughput. Even though the processors are functionally dispersed, the system is a single, unified computing facility, with the processing speed and capability of a large, conventional computer.

Solves growth problems

This new, modular architecture offers easy-to-implement solutions to the problems of system planning and growth. The system manager can add (or delete) processors or file storage as workloads change.

Expansion can occur in modular, incremental steps, at predictable, affordable costs. Only enough processing power is required at a given time to accomplish the immediate workload. Important capital is not tied up in costly overcapacity, yet the work is not delayed by a bogged-down, overworked computer.

Protects software investment

The ARC system can use your present Datapoint system software. When additions are made to the system, current software is not affected. All the Datapoint resources suitable for participation in an ARC system are completely compatible.

While direct hardware cost comparisons are difficult because of differences in architecture, our studies indicate that the cost of an ARC system may be only 50% to 70% of the cost of a more conventional system with equivalent capabilities.

Total adaptability

The applications at work in an ARC system can be as varied as the diverse functions of the business environment. The concept applies to any type of firm engaged in one or multiple endeavors. Its usefulness is equal whether it's in a corporate home office, a division headquarters, or a remote office. Or all three can simultaneously employ their own ARC or other Datapoint systems and interconnect them through telecommunications links.

A nationwide support network

There are more than 500 Datapoint Customer Service Representatives in the field, stationed in over 130 local service area offices. The system is designed to place customer service and support as near as possible to Datapoint's 11,000 installations.

Write for more information

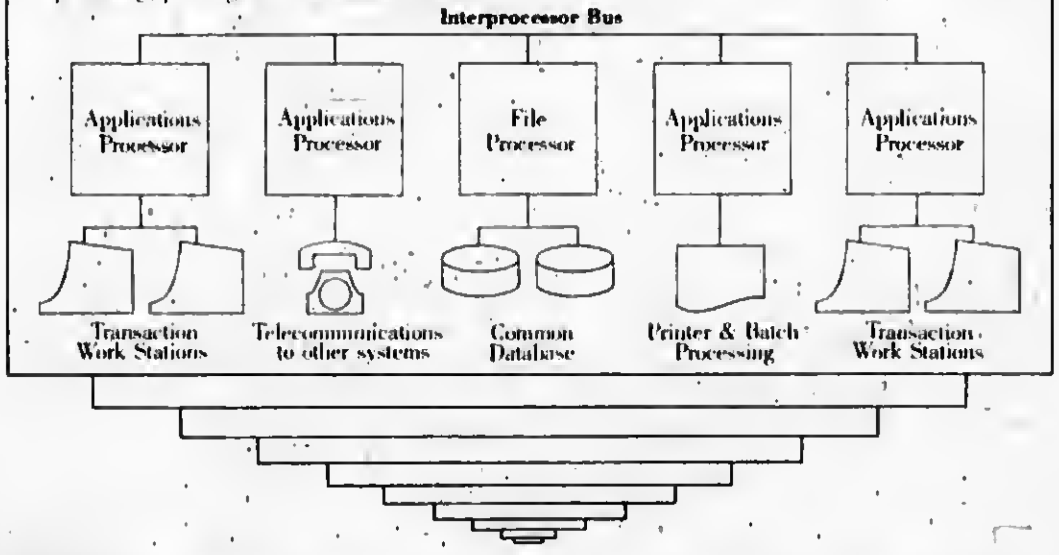
A Datapoint Attached Resource Computer system is the ideal solution to your business data processing needs. Datapoint has to out-think its competition. The ARC system puts us another big jump ahead.

A booklet describing the features and advantages of the ARC system is available by writing to Datapoint Corporation, Marketing Communications Dept. (M62), 9725 Datapoint Drive, San Antonio, TX 78284. Or call the Datapoint sales office nearest you.

◄ The adaptability of an Attached Resource Computer™ system is another example of how Datapoint out-thinks its competition to help you out-think yours.

ONE ARC™ SYSTEM!

One of an almost limitless number of configurations, this ARC system contains up to 480K of on-line user memory, 200 MB of disk storage, and 48 transaction work stations, as well as facilities for batch processing, printing and telecommunications.



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NEW MEXICO: BFA (505) 292 1212
ARIZONA: OEM Specialties (602) 948 3360
PACIFIC COAST: Group III Electronics (213) 542 7391

Telenet Service Expands

VIENNA, Va. — Telenet Communications Corp. has initiated international packet-switched data communications services to Israel, Singapore and the Philippines. The service enables terminal users overseas to connect on a demand basis to computers using the Telenet packet network in the U.S.

International packet-switched service is now available in 22 countries in Europe, North America, Asia and the Middle East. The overseas telecommunications administrations and the U.S. international record carriers jointly provide the interconnection facilities between each participating country and Telenet in the U.S.

In Israel, the Ministry of Communications provides public dial-up access to Telenet-based computer systems. Charges for the service average $20/hour, including connection time and traffic charges.

Similar services from the Philippines are available at an average cost of $26/hour, according to Eastern Telecommunications of the Philippines, Inc., the agency responsible for international telecommunications there.

In Singapore, access to Telenet is available with both dial-up and leased-line arrangements from the Telecommunications Authority of Singapore. Rates average $22/hour.

Telenet is based at 8330 Old Courthouse Road, Vienna, Va. 22180.

ADI Programmable Unit Emulates Most CRTs

ANN ARBOR, Mich. — The Series 60 Basic Universal Terminal has been introduced by Applied Dynamics International (ADI). With a programmable read-only memory (Prom) that can be programmed to meet most protocol requirements, the Series 60 can simulate the functions and operation of CRT terminals from other manufacturers, the firm claimed.

The Series 60 incorporates two microprocessors: a Z80 which handles the communications I/O and a dedicated special-purpose micro for display refresh.

Direct memory access (DMA) transfer is available from the bus by locking out the Z80. The modular Prom software is both linking and relocatable, according to a spokesman.

The Series 60 is available in read-only, keyboard send/receive, automatic send/receive, multidrop and intelligent configurations, in all screen formats from 8 by 16 to 40 by 80. Three circuit boards are used (program microprocessor, video and timing control and power supply), with provisions for three additional boards (for internal memory expansion to 8K bytes and a floppy controller, for example).

Establishing the characteristics of each customer's Series 60 configuration is as simple as defining the program requirements on ADI's configurator and burning a corresponding Prom, the spokesman asserted.

Ascii, Baudot, Ebcdic, Hollerith or other desired standard or nonstandard code conversion is accomplished in the process. The user's program, including control characters, can be redefined at any time by ordering redefined Proms from the factory.

The Series 60 is available as a complete terminal, including keyboard and monitor; as a controller only; or a board set only. Both standard and custom keyboards are available.

Controller-only prices start at $720, ADI said from 3800 Stone School Road, Ann Arbor, Mich. 48104.

Modem Comes In Assembly Kit

SAN FRANCISCO — Dynamic Devices has introduced an acoustically coupled modem assembly set.

The unit reportedly can be assembled in less than 15 minutes with nothing but a screwdriver and a pair of pliers. No soldering is required.

Since all components are tested, calibrated and burned in, expensive test equipment is completely unnecessary, the firm said.

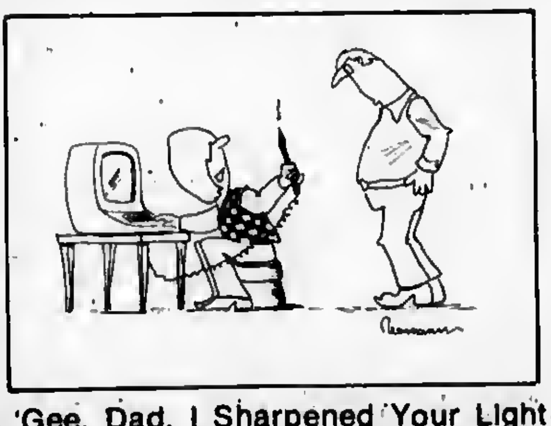
The coupler will operate in both originate and answer modes, with full- and half-duplex capability. An RS-232C/-20ma interface is standard.

No special telephone lines are required, and the device is fully compatible with telephone company 300 bit/-sec equipment, a spokesman noted.

The AC3C is available with a 20-day money-back guarantee. An additional 120-day warranty on parts and labor is provided.

The AC3C will be sold at a introductory price of $149.95 until Jan. 1, after which the regular price of $169.95 will become effective.

Dynamic Devices is at 1087 Mississippi St., San Francisco, Calif. 94107.



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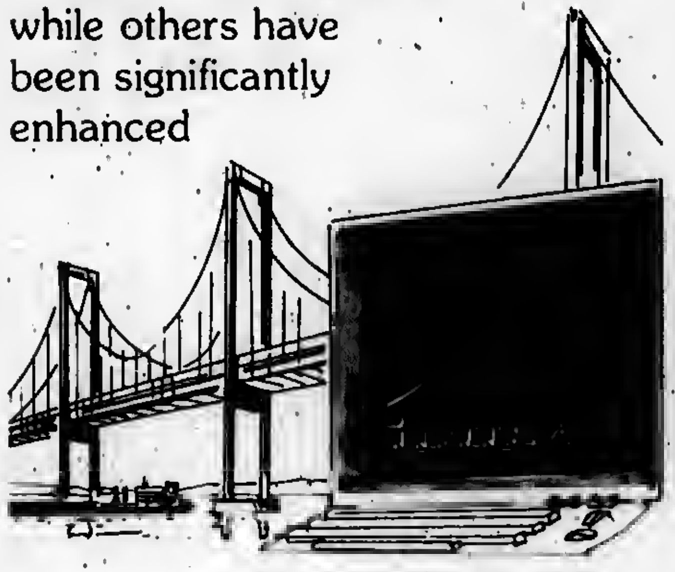

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Auto-Answer Modem Runs at 1,200 Bit/Sec

PALO ALTO, Calif. — Prentice Corp. has introduced a two-wire, simplex/-half-duplex, Bell-compatible modem for the automatic answering of computer calls.

The P-202S 1,200 bit/sec modem is a direct-connect unit that interfaces with the two-wire, dial-up switched telephone network through a 97A or 97B jack, Prentice said. A data access arrangement is not required.

Users can connect the P-202S to the switched network in any of three standard modes: programmable, fixed loss or permissive.

Specifications of the P-202S include a serial binary asynchronous data format, -3 to -12 dBm transmit level (programmable by a resistor in the 97B jack), -48 dBm receiver sensitivity and frequency shift keying modulation, the vendor noted.

The P-202S features full, built-in "at-a-glance" diagnostics, Prentice continued.

The modular unit has a mechanical design matching that of all Prentice data communications products. Therefore, the rack-mountable card version — with front panel, but without a power supply — fits all standard Prentice enclosures, the vendor explained.

The card version of the P-202S is priced at $340 in single quantities; the stand-alone version — card and power supply in a standard 2-3/4 in. by 4-1/4 in. by 11-1/4-in. enclosure — costs $455 in single quantities, Prentice said from 795 San Antonio Road, Palo Alto, Calif. 94303.

Portable Data Line Monitor Debuts

PALO ALTO, Calif. — A portable data line monitor (DLM) with capabilities for basic line monitoring, transmitting data patterns and messages, terminal rolling and addressing and electronic strip chart recording is available from Arbor Communications Corp.

Billed as a "powerful tool for diagnosing problems on communications lines," the DLM contains an integral 5-in. CRT that displays such standard codes as hex, Ascii and Ebcdic. Send/receive data is inverted and character underscoring can be used for event marking, an Arbor spokesman stated.

Monitor starting and stopping can be controlled from the EIA or control hubs or by data comparison, the spokesman noted, adding that an optional electronic strip chart recording display allows the user to review time-oriented events captured on the parallel TTL data or EIA data set leads or from autocall 801 signals.

The Arbor Model 101 DLM costs $6,100, the vendor said from 3784 Fabian Way, Palo Alto, Calif. 94303.

GDC Unveils Multiplexer

DANBURY, Conn. — A four-channel microprocessor-based statistical multiplexer has been introduced by General Datacomm Industries, Inc. (GDC).

The TDM 1240 assembles and transmits variable-length data blocks composed of only the actual data characters from the individual channels so that it can achieve a typical multiplexing efficiency of 200%, the firm said.

The unit was designed to provide data transparency to all information bits, including parity, in each transmitted data character, according to the firm. Because of this, the TDM 1240 is not restricted to use with only alphanumeric printing devices and the capability to flag errors encountered in local distribution is not sacrificed.

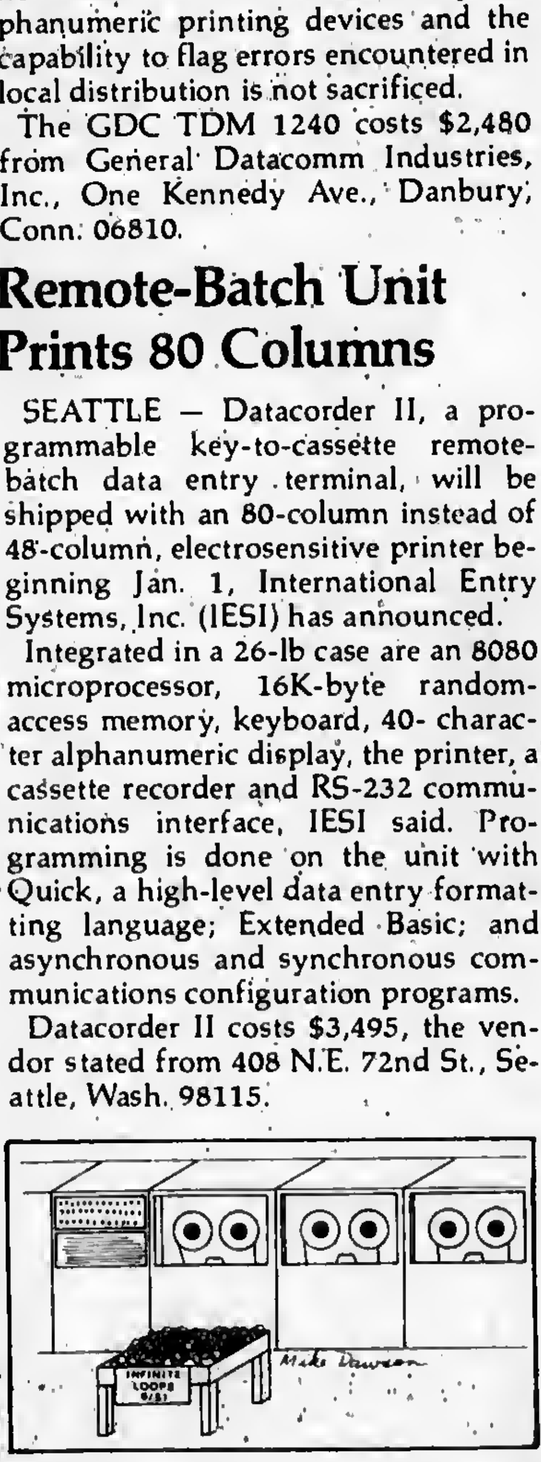
The GDC TDM 1240 costs $2,480 from General Datacomm Industries, Inc., One Kennedy Ave., Danbury, Conn. 06810.

Remote-Batch Unit Prints 80 Columns

SEATTLE — Datacorder II, a programmable key-to-cassette remote-batch data entry terminal, will be shipped with an 80-column instead of 48-column, electrosensitive printer beginning Jan. 1, International Entry Systems, Inc. (IESI) has announced.

Integrated in a 26-lb case are an 8080 microprocessor, 16K-byte random-access memory, keyboard, 40- character alphanumeric display, the printer, a cassette recorder and RS-232 communications interface, IESI said. Programming is done on the unit with Quick, a high-level data entry formatting language; Extended Basic; and asynchronous and synchronous communications configuration programs.

Datacorder II costs $3,495, the vendor stated from 408 N.E. 72nd St., Seattle, Wash. 98115.



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Interdata Bulk Core Disk Emulator
And now, Dataram's BULK CORE is available for Interdata users who want to go beyond the normal addressing boundaries of the host minicomputer. BULK CORE does it at much higher speeds and is all-electronic, and that means no moving parts. And a 15¾" BULK CORE system offers 2.0 megabytes of peripheral storage.

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	400 x 400†	2555 secs	3774 secs	1840 secs
Sharable Development Software	editor	Yes	No	Yes
	linker	Yes	No	No
	assembler	Yes	No	No
	compiler	Yes	No	No
Small (under 40KB) Development Modules	editor	Yes	Yes	[illegible]
	linker	Yes	Yes	[illegible]
	assembler	Yes	[illegible]	[illegible]
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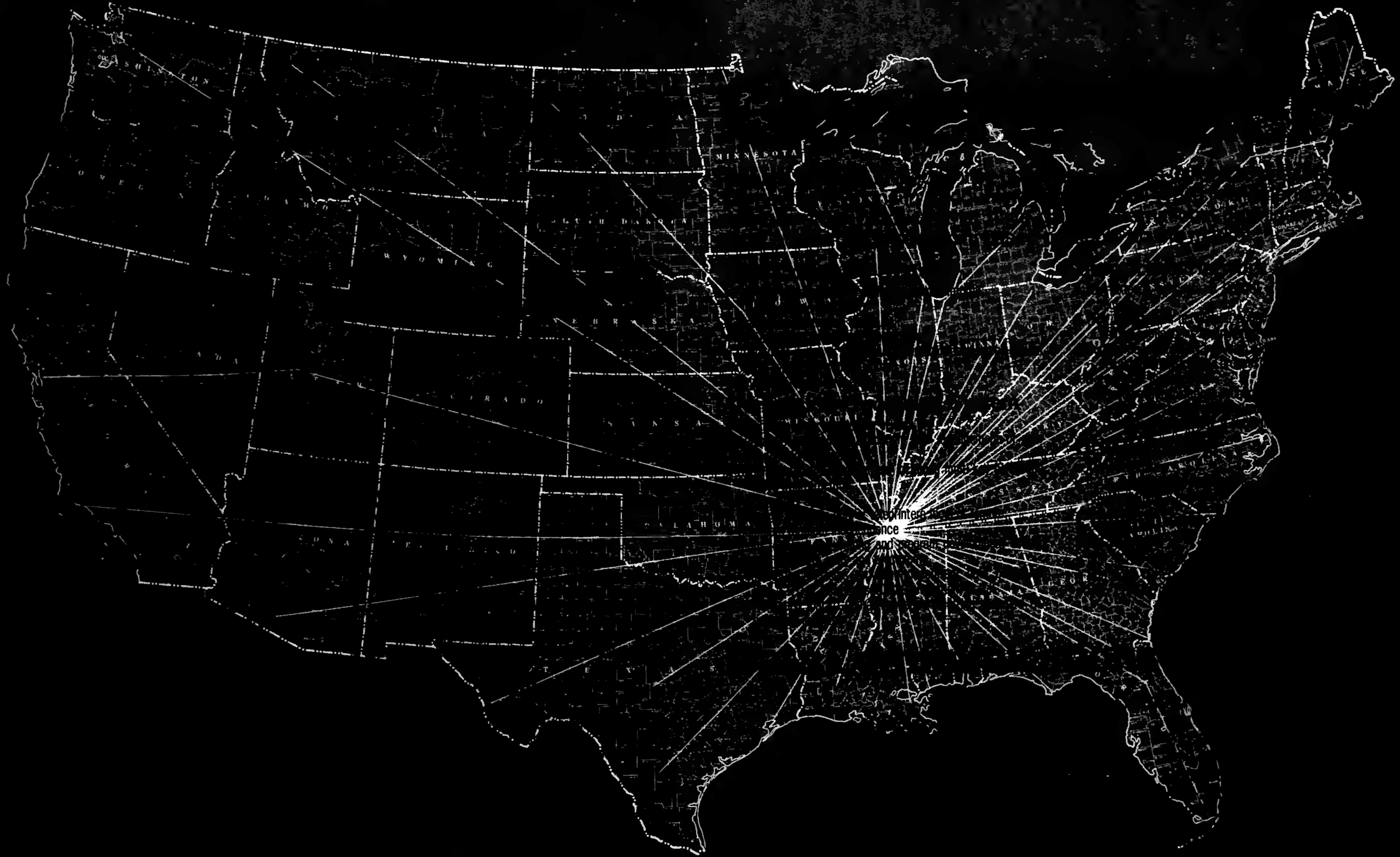
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Bits & Pieces

Printer Series Offers Up to 1,200 Line/Min

MELBOURNE, Fla. — Hetra Computer and Communications Industries, Inc. has introduced a series of medium- to high-speed printers that reportedly incorporates several state-of-the-art features.

The Hetra 3300 series includes printers rated at 600-, 900-, 1,000- and 1,200 line/-min; they are available with interfaces for IBM 360 and 370 mainframes, most minicomputers and the Digital Equipment Corp. 2020, a spokesman said.

Up to five carbons can be printed on the devices, and forms can vary in width from 3.5-to 19 in. The printers accommodate either an electronic vertical forms unit or 12-channel paper tape unit for forms control.

Printing pitch is 10 char./in., while line spacing is selectable to either 6- or 8 line/in.

Prices for the units vary from $12,500 for a 600 line/min printer with a standard minicomputer interface to $30,000 for a 1,200 line/min unit compatible with the DEC 2020. The price of a 360/370-compatible version has not been established, the spokesman said from 1151 S. Eddie Allen Road, Melbourne, Fla. 32901.

Stand-Alone OCR System Puts Out 5 Page/Min

NORRISTOWN, Pa. — An optical character recognition (OCR) system from Scan-Data Corp. is said to accommodate a wide range of DP and distributed DP applications and to be capable of reading five standard pages per minute.

The Scan-Data 1150 can read alphanumeric OCR-A or OCR-B fonts and, optionally, numeric handprint. System features include an alphanumeric font, a magnetic tape unit, on-line display for reject handling, automatic feeder, two-pocket stacker and an RS-232C communications interface, according to a spokesman.

The purchase price of the stand-alone unit with OCR-A or OCR-B is $41,000; with the numeric handprint option, it is priced at $48,000. On a five-year lease, the unit costs $1,150/mo, including maintenance; the handprint option costs an additional $190/mo. Scan-Data is at 800 E. Main St., Norristown, Pa. 19401.

Independent Memory Held Best Buy for IBM Users

By Anthony J. Coppola
Special to CW

Burgeoning deliveries of IBM 30 series systems will force a repetition of recent economic history in the prices of memory: The prices of IBM memory for outmoded 370 systems will plummet.

Despite this, however, other factors will continue to make the economics of independent memory ownership a better investment.

The pricing history of IBM 360s and out-of-production 370s — assuming it is repeated — provides a good clue to why this is true. Although newer systems are typically leased from IBM, the balance swings more and more toward ownership as time goes by.

Statistics compiled by International Data Corp. (IDC), a market research firm, indicate that nearly 97% of the 360s extant in 1977 were purchased; this compares with industry estimates of approximately 20% ownership when the 360 line was introduced. More than half of these systems were user-owned, while the remainder were owned by third parties such as leasing companies and brokers.

Stable, Not Static

Although the 360 market is stable, it is not necessarily static. IDC figures show that between 1973 and 1977; the amount of memory per average system increased nearly 50%.

Since IBM no longer builds memory for this market, the increase must have come from independent memory makers. Rather than fading away, then, the 360 base is increasing, at least in terms of capacity.

Three factors have contributed to this growth: IBM's own marketing philosophy, the nature of companies owning 360s and the inherent advantages of using independent memory.

IBM's policies encourage independent memory suppliers. The introduction of systems typically offering greater capacity and better price/performance ratios encourages the users who lease older systems to migrate to the newer ones.

The systems abandoned by these migrating lessees typically move into the used marketplace, usually at a substantial price reduction. For example, a 370/145 costs about $1 million new but about $220,000 used. And IBM does not sell systems to its leased base, nor does it lease to its purchased base.

With newer IBM systems offering greater capacities and improved performance, why would anyone want to use an old system? The answer has to do with the type of company that uses 360s and 370s. Basically, there are three general categories of users, each of which has its own operating requirements.

In the first category is the Fortune 500 type of company. It may have multiple 370 or 30 series systems, particularly to handle on-line DP. At the same time, however, it may have

(Continued on Page 60)

With CPU, Service Tracks Each Vehicle In Corporate Fleets

EDEN PRAIRIE, Minn. — The use of computers by auto manufacturers is an old story, and the use of microcomputers in cars is a very new story. Somewhere in between lies the use of computers to track service and financial data on autos, particularly the fleets of cars maintained by many companies for their personnel.

"If corporations with fleets of company cars or trucks maintained and disposed of their vehicles the way consumers do, productivity would drop and expenses and financial terms would become unmanageable," according to John A. Lever, vice-president for information services at Gelco Corp., a service transportation company here.

"Today, while most typical fleet purchasing arrangements have simplified the selection, financing and the selling off of the vehicles, few operations take care of all the details that occur in between," Lever added. "Gelco uses a computer for almost every facet of its truck, trailer and auto fleet leasing and management operations.

"Our system backs up Gelco's customers throughout the life span of the leased vehicles: Our support starts with the choice of make and models and continues through the financing, maintenance and eventual resale of the used vehicles," Lever noted.

The company's Honeywell, Inc. Level 66 Model 60 system tracks data on more than

(Continued on Page 68)

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Independent Memory Seen Best Bet for Users

	256K BYTES		512K BYTES		1M BYTE	
	EMM	IBM	EMM	IBM	EMM	IBM
POWER CONSUMPTION (KILOWATT/HOUR)	1.4	6.7	2.3	13.4	2.5	26.8
HEAT DISSIPATION (BTU/HOUR)	4,774	25,300	7,820	50,600	8,000	102,200
FLOOR SPACE (SQUARE FEET)	8.74	17.16	8.74	34.32	8.74	59.9
MONTHLY OPERATING COST	$67.76	$338.54	$111.25	$677.08	$117.71	$1,354.15

Operating costs are based on the following assumptions: memory runs 700 hours per month; electricity costs 3.47 cents per kilowatt hour (typical for the Los Angeles area); and dissipation of 12,000 BTUs requires one ton of air conditioning using 3.5 kilowatt hours.

(Continued from Page 59)

one or more 360s for specific applications.

The software has been developed and personnel have been trained. The company wants to extend as long as possible the life of the system to amortize its associated costs.

At another level is the medium-sized company that may have leased a 360 at one time from a third-party leasing company but has decided to convert the lease to a purchase. Its primary concern is to get maximum performance out of the system. It wants to use the system to its full capacity and forestall the necessity of moving up to a larger, more costly system.

At the third level is the small firm that buys a 360 in the used marketplace. This is usually the company's first large mainframe and represents an upgrade from a smaller system or a move from a time-sharing service.

The mainframe represents a major capital outlay and, because this type of user is extremely cost-conscious, it wants to maximize the use of the system at the lowest possible operating costs.

Of course, there is still another major user of used systems — the third-party leasing company. With its capital tied up in "obsolete" systems, it needs to maximize the return on its investment dollar. This means enhancing the performance and capacity of the system so it comes close to the newer systems, which allows the lessor to offer the system at a substantial cost savings over the newer systems.

Inverse Price Relationship

The challenge to the purchaser of used systems, therefore, is to maximize its investment. Whether an end user or a third-party leasing company, the goal is to extend life and improve the performance of the existing system. Adding memory with performance enhancements is the most effective way to accomplish this.

The traditional price relationships between independent memory suppliers and IBM is turned around in the used computer market. IBM memory — since its design is several years old and uses older, slower, often less reliable technology — typically drops in price as a function of time.

However, it is not uncommon for memory supplied by an independent to hold its value. It is also easier to dispose of memory made by an independent supplier.

In a typical situation with a new IBM system, the price for independent memory starts at approximately 70% to 80% of the IBM price. As more independents enter a specific market, price competition widens the gap to 40% to 60%.

As soon as IBM stops actively building a system, its price for memory in the now "used" market plummets. In some cases, used IBM memory is about 50% of the price of independent memory.

For example, in the 360/65 market, 512K bytes of IBM memory costs approximately $20,000. The same amount of independent memory will cost $45,000 to $50,000.

Inherent Advantages

With this inverse price relationship, one would expect that users would prefer to buy IBM memory. After all, even if IBM may not be building memory for a specific machine, any memory in service is still supported by IBM.

However, the opposite is true. Experienced users recognize that independent memory is a better value. There are sound business reasons for this.

Independent memory has inherent competitive advantages over IBM memory, and the cost of ownership of independent memory is substantially lower than IBM memory. Also, third parties (dealers) prefer to sell. And many users have found the cost of IBM attachments sometimes cost more than the memory — a situation not true with the independents.

When an IBM system is introduced, the independent memory supplier not only has a price advantage over IBM, but also offers features and enhancements not available from IBM. These features and enhancements take on added significance in the used memory market since they improve performance and extend the life of the system.

Among the typical features and enhancements offered by an independent memory supplier are:

- Memory capacity that exceeds the stated capacity of the system. It is not the technical limitations of the CPU that determine the maximum capacity of memory, but rather IBM's marketing strategy. Therefore, by using independent memory, a user can increase the throughput of an existing system at a lower cost than upgrading to a faster, more expensive CPU.

With independent memory, a user can usually get at least twice the IBM stated capacity — in some cases, much more.

- Speed enhancements. It is possible to achieve faster processing times with independent memory. Taking advantage of this higher memory speed, system throughput can be increased without any additional main memory.
- Smaller memory increments. When a user adds independent memory, he can usually add it in smaller increments than IBM offers. This means he can better control the amount of memory on his system. This eliminates the situation of excess memory capacity on a system.
- Field upgrading. When a user moves up to a larger system, IBM comes in and replaces everything, which makes upgrading a costly investment. By contrast, most independent memory is field-upgradable to the larger system.

Also, most independent memory suppliers will offer upgrade and conversion provisions in their lease agreements to further minimize memory costs.

- Total support for used memory. Actually, the term "used memory" is a mishomer. It actually means equipment that has been leased to others.

However, since the independent memory supplier is still building and supporting the used market, a user who orders memory is actually getting new or refurbished memory. This includes new components and the manufacturer's warranty, which is the same as a new memory warranty.

Lower Ownership Cost

Besides these features and enhancements offered by independent memory suppliers, it costs less in terms of energy and floor space to use independent memory. Even though the initial price of IBM memory may be lower in the used market, the long-term operating costs will be higher.

For example, a 370/155 is 50% more powerful than a 370/148, yet a Model 155 used memory costs only 50% that of a new 148.

At Electronic Memories & Magnetic Corp. (EMM), we recently completed a comparison of the cost of operating our memory and IBM's on a 360/65. This comparison is shown in the box above. A glance at the table shows the operating costs of the independent memory are significantly lower than those of IBM memory.

By extending the life and performance of older 360 and 370 systems, users are realizing direct benefits. They are amortizing the cost of these systems over a greater period of time. At the same time, they are increasing their machines' capacity so they come closer to the newer systems. This means users can avoid the high capital investment required for a new system.

Whether the 370 used market will parallel the evolution of the 360 used market remains to be seen. However, similar patterns have developed within the 370/145 and 370/155 product areas.

If it does occur, maybe someday in the not-so-distant future, rather than bragging about a new computer system in an annual report, a company will brag about extending the capabilities and uses of its existing system.

Coppola is director of marketing with Electronic Memories & Magnetics Corp. in Hawthorne, Calif.

Tape Records To 6,250 Bit/In.

GRAHAM, Texas — Graham Magnetics, Inc. has introduced a magnetic tape that is said to offer significant advances in the tape coating and in the dispersion of the magnetic particles on the tape.

The Epoch 480 is certified by the manufacturer for all bit densities through 6,250 bit/in. It is guaranteed for 20 years.

The coating process reportedly offers better head-to-tape contact, as lessening wear on both the tape and the read or write head of the drive.

The price for a reel is "in the $16 range," depending on quantity and shipping, a spokesman said from Graham, Texas 76046.

Cabinet for Printouts Features Locking Top

W. BABYLON, N.Y. — Vue-Fax, Inc. is offering a printout security cabinet for housing output binders with built-in hangers.

Incorporating a top that locks, the unit is said to provide 31.5 in. of filing area for 14-7/8-in.-size output. Ball-bearing casters allow the unit to be moved from place to place.

The security cabinet sells for $190 from Vue-Fax at 101 Alder St., W. Babylon, N.Y. 11704.

Reporters Can Still Meet Deadlines

Typesetting System Gives L.A. the Latest News

LOS ANGELES — Reporters on the *Los Angeles Times* can now incorporate late-breaking developments into their stories and still meet publication deadlines, thanks to a computerized typesetting system that significantly cuts production time.

"Our typesetting procedures have changed drastically during the past four years," according to Joe Malcor, superintendent of the electronics department at the *Los Angeles Times*. "For many years, an operator would typeset manually on a Linotype machine. The Linotype produced characters in hot lead form, and the operator was responsible for designating column width, hyphenation and line justification. Display ads had to be cut and laid out by hand."

Others Inadequate

"We had tried two other systems that produced text copy on photographic paper, but one required loading a paper tape with typesetting instructions into the machine, then printed only one character at a time. The second system could only print one or two columns per sheet because the paper wasn't newspaper-wide," Malcor recalled.

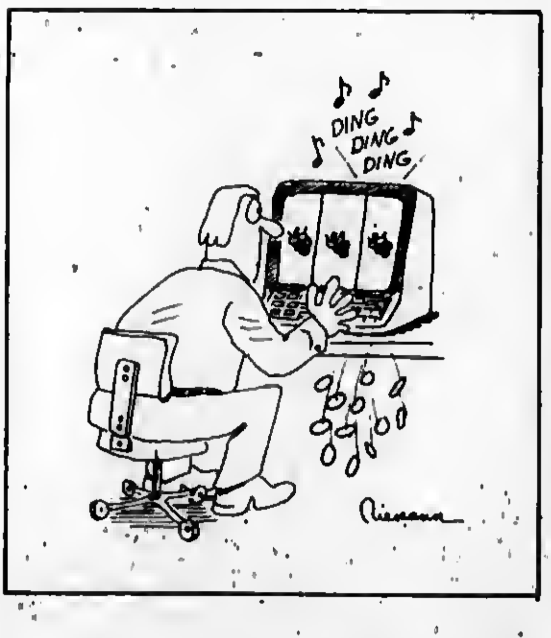
In 1974, the *Times* began using computerized photocomposition for typesetting to replace those long and tedious procedures. The typesetting system relies on an IBM 370/158 mainframe.

Peripheral equipment includes three Autologic, Inc. APS-4-100 typesetters, two APS-18 communications controllers and two Evans & Sutherland Computer Corp. digitizing systems, as well as seven T8000 tape transports and six D3000 disk drives manufactured by Pertec Computer Corp.

"We have approximately 100 CRTs for text input throughout the paper's different departments," Malcor said. "The operator enters the text into the CRT with coded directions for typsetting, such as column width and typeface. The IBM 370/158 then takes care of line justification and hyphenation, which frees the operator from making those decisions.

"A line printer produces copy that is returned to the editor for proofreading. After editorial approval, the text is sent via a direct line from the mainframe to the APS-18 communications controller, where it is received by the disk drive.

"Finally, the APS-18 deposits the text into the typesetter, and the typesetting process continues. The photocomposed copy of the article is then sent through the remainder of the printing procedure," he explained.



The typesetting process for display ads varies slightly from the process for articles. It is based on a digitizing system that was designed especially for the *Times*.

"The digitizing system allows us to put the ad text on a video display board, where an operator can manipulate the typeface and line lengths and can make any changes or additions desired," Malcor said. "When he is satisfied, the ad is entered into the typesetting cycle in the same manner as an article. Ad layouts are no longer done by hand."

"All articles and display ads pass through the disk drives that maintain the operating program for the typesetting system," Malcor said. "But with a paper as large as the *Times*, we have found that a backup system is a necessity.

"For this reason, we use a magnetic tape-based system where the operator can input the story onto magnetic tape that is then transferred to the tape transport on the APS-4-100 to be typeset.

"The computerized typesetting system has saved the employees a significant amount of time. We have been able to push back editors' deadlines and still get the paper printed and distributed on time," he pointed out.

"It now takes an average of four minutes to run one page of the *Times* classified section through the entire typesetting procedure. The stock page takes two and a half minutes. Typsetting itself takes only seconds."

Many of the decisions that were made by the *Times* personnel, such as hyphenation and line justification, are now made and carried out by the computer system, Malcor noted. Because of this, the paper has been able to redirect employees to other tasks.

Furture plans? "We don't have any plans to expand this system to other applications. But the *Times* is a progressive newspaper and plans could change," Malcor concluded.

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Line Sensor Guards Units on 115 Vac Lines

PLEASANT HILL, Calif. — Calex Manufacturing Co., Inc. has introduced an ac line sensor designed to safeguard equipment attached to a 115 Vac line.

The Model 829 is used as a window comparator, according to the company. A voltage variation, either above a preset high or below a preset low, will cause the unit's output to be switched off normal, thus protecting sensitive equipment from over- or under-voltage conditions.

The unit is available in two models: the relay-output Model 829-R and a transistor output Model 829-T. Both can be used to detect a low-voltage condition ranging from 90- to 110 Vac, and a high-voltage condition ranging from 120- to 140 Vac, a spokesman noted. In addition, the two units can respond to changes in average line voltage in as little as 100 msec, the spokesman added.

The 829-R costs $68 and the 829-T, $89, from the company at 3355 Vincent Road, Pleasant Hill, Calif. 94523.

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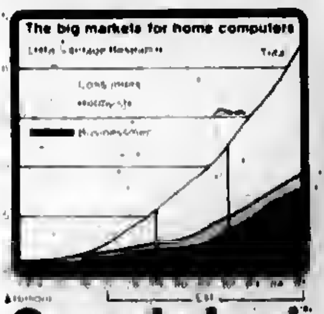

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CPU, Peripheral Replacements Let Cycle Maker Rev Up Throughput

MILWAUKEE — One of the country's leading sellers of heavyweight motorcycles, AMF/Harley-Davidson Co., Inc. (H-D) here, recently revved up its computer throughput by replacing its IBM communications equipment, disk drives and mainframe with Memorex Corp. CRTs and disk drives and an Itel Corp. plug-compatible CPU.

By replacing an IBM 370/145 with an Itel AS/4; IBM 2314 and 3330 disk drives with Memorex 3675 drives; and IBM 3277 communications gear with Memorex 1377 CRTs, the company was able to increase its throughput by a factor of 2.5 over its previous configuration, according to Ron Durchslag, manager of computer operations for the company. "We achieved this with no increase in hardware costs," he noted.

H-D's computer center processes a variety of applications for manufacturing, marketing, sales, service, accounting and parts and accessories distribution. Before settling on its current configuration, the company went through several conversions.

The first step was swapping the mainframe for the Itel 2M-byte unit. After this, the disks were replaced, then the CRTs.

Savings of $20,000/Mo

"To have upgraded our IBM mainframe, terminals and disks to get the kind of performance we are getting with the new system would have cost us in excess of $20,000 a month more than we're now paying. The Memorex equipment contributes greatly to these savings," Durchslag said.

H-D converted to Memorex CRTs for several reasons, he added. "Our users liked their style and ease of use, and our analysis showed they are the most error-free of all the terminals we investigated."

Durchslag decided on the Memorex 3675 drives, with a storage capacity of 400M bytes and a data transfer rate of 806,000 byte/sec, mainly because of their price/performance.

"The IBM drives performed quite well," he noted, "but we've actually had fewer problems with the Memorex modules. In addition, we've been able to use the Memorex two-channel switch option, which increases throughput by reducing I/O wait time."

H—D also uses a Comten, Inc. front-end processor to control the company's teleprocessing networks, a tape subsystem and two high-speed printers. For data entry, a Four-Phase Systems, Inc. minicomputer, with 14 Four-Phase terminals, front ends the mainframe.

The company uses six teleprocessing networks for data transmission within the home office and between the home office and the various manufacturing, distribution and parts and accessories warehouses both in Wisconsin and Pennsylvania.

The 35 on-line Memorex 1377 terminals give users instant access to the various data bases, allowing a wide range of applications from order entry and verification to credit checking, sales projections and parts inventory.

Of the firm's various data base applications, the sales and parts and accessories systems are among the most advanced. The sales system uses two data bases: dealer services and vehicle order entry.

The dealer information data base contains all pertinent dealer information, while the vehicle order entry data base contains all dealer orders. The latter data base, with information on vehicle type, date needed, special options, colors, quantities and so on, contains the information needed for the beginning of the manufacturing process.

As the dealer due date for a particular vehicle approaches, orders to build are transmitted over the manufacturing network to the factory in York, Pa. When completed, the vehicles are shipped directly from there to the dealer. Shipping information, along with registration and vehicle identification information, is transmitted to the Milwaukee headquarters. The invoices are sent to the dealer from Milwaukee.

"With the complexity of processing and communications that our applications involve," Durchslag said, "reliability and speed are important for customer service. We feel our current system ensures both."

Free Literature Offered

Several vendors have announced the availability of free literature that might be of interest to DPers.

- Tally Corp., 8301 S. 180th St., Kent, Wash., is offering a booklet called "How to Select the Printer You Need." The booklet is said to cover available types of medium-speed printers and features to look for when purchasing a unit. Intangibles influencing cost-effectiveness and best value are also discussed, the firm noted.
- A Booklet from Compudraft, at 1818 Market St., Philadelphia, Pa. 19103, discusses interactive computer graphics. The brochure enumerates the benefits of interactive computer graphics in a variety of drafting applications, the company noted, and details some historical aspects of this relatively new technology.
- Floating Point Systems, Inc., P.O. Box 23489, Portland, Ore. 97223, has issued a brochure discussing the use of its AP-190L array processor with IBM 360s and 370s.

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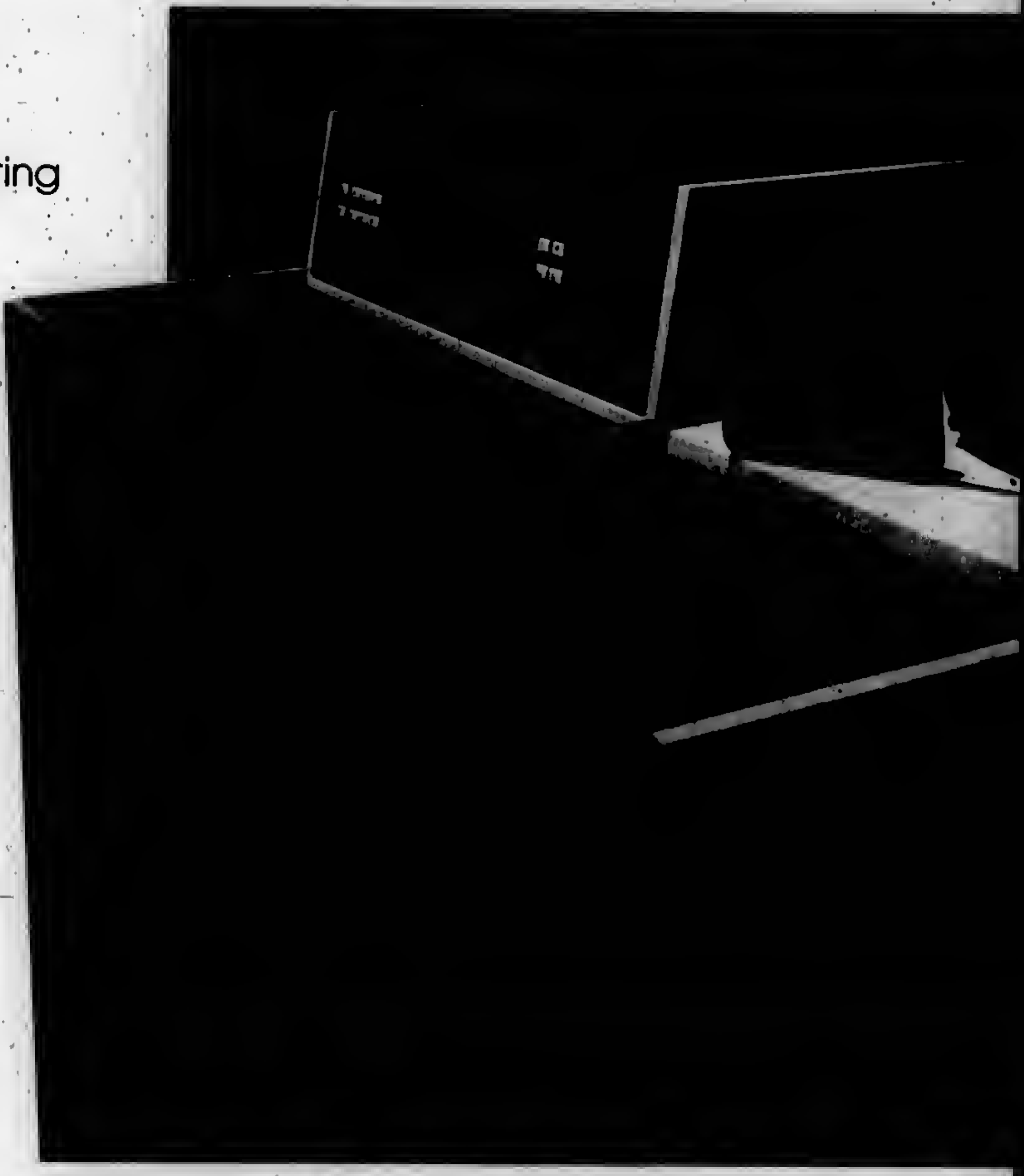

Consider the operating cost of the Kodak laser printer versus the operating cost of a paper-impact printer.

Consider, for example, the cost of generating a 1000-page, 3-copy report.

Three-part stock paper costs about $22.30* per 1000 pages. But you can put the same report on microfiche for around $1.50.

So, from the standpoint of materials alone, paper is about 15 times more expensive than microfilm.

Time and labor costs are important factors, too. Especially in a DP department. Which is why you should know that it would take almost 50 minutes to decollate, burst, bind and package a 1000-page report. It would take only 9 minutes to print, duplicate and package the same report on just 4 microfiche.

A Kodak laser printer can save you money in other ways, too. With a paper printer, you'd have to load at least 12 boxes of paper to print the equivalent of one cartridge of 16-mm film. Compared with fiche, the margin of difference is even wider. You'd need 31 boxes of paper to print the equivalent of one fiche cartridge.

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In fact, when you add up the savings in materials and labor, you'll find that printing with a Kodak Komstar laser printer is about 87% cheaper overall than printing with a paper-impact printer.

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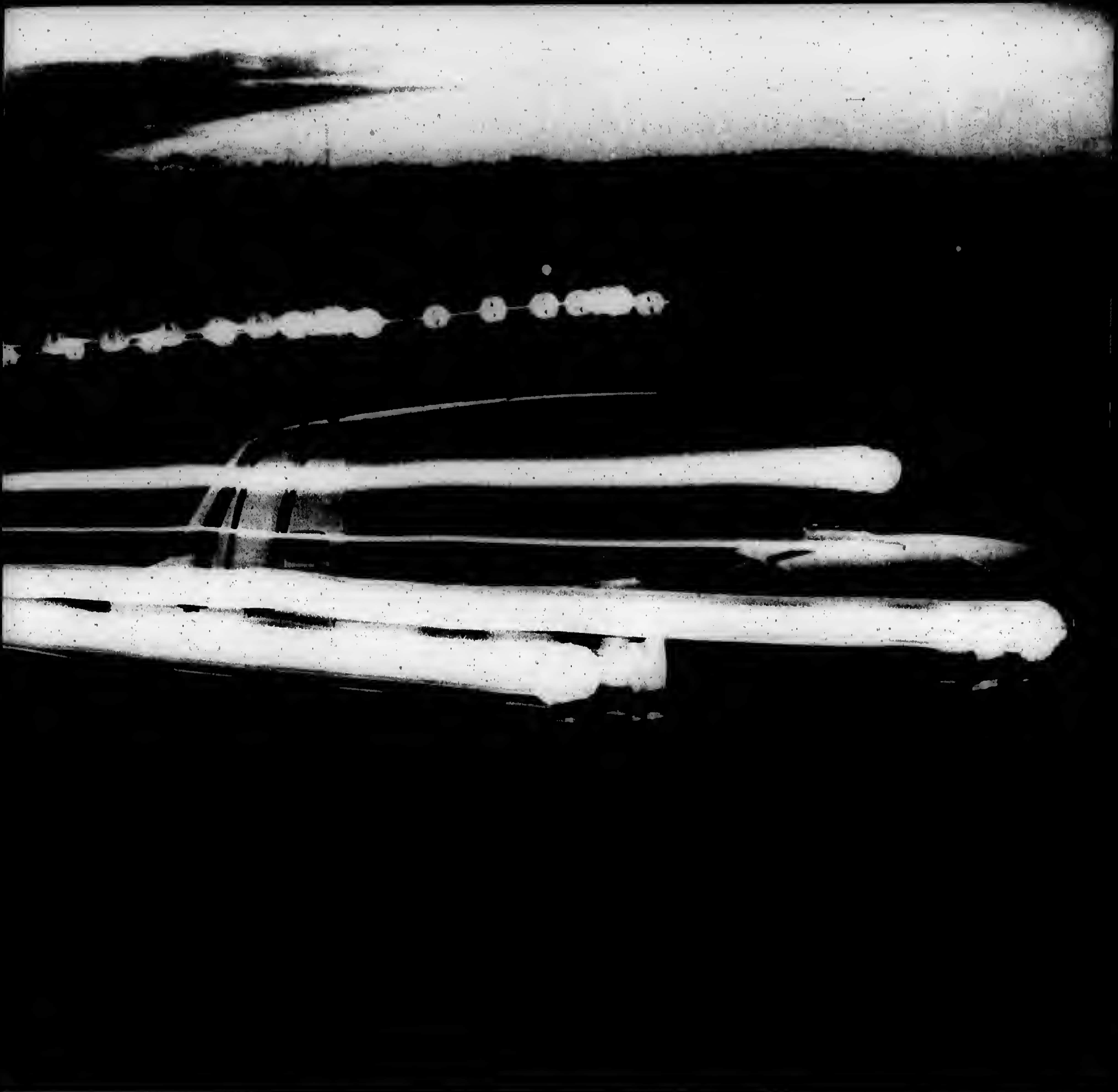

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Handles Data Entry on Field Test

Key-to-Disk Unit Goes on Army Maneuvers

FT. BRAGG, N.C. — Humidity from almost daily rain, unscheduled power shutdowns and near-freezing temperatures at night — not the ideal environment for computer equipment.

In March of this year, however, a key-to-disk system handled all the data entry requirements of a U.S. Army combat service support unit on an eight-day field test in the North Carolina woods and is continuing to help the unit save time and increase productivity at its base here at Ft. Bragg.

The Army's 18th Airborne Corps is a tactical combat force ready to support U.S. action any place in the world. One of its major subordinate commands, the 1st Corps Support Command (Coscom), uses an IBM 360/40 mainframe to provide all administrative and logistical information handling for a corps force that can exceed 100,000 personnel as well as for its helicopters, weapons systems, tanks and other equipment.

Prepared for providing tactical combat service support for a military operation of any size, Coscom can assemble its mainframe on two specially equipped 45-ft tractor trailers for movement within two to four hours. The computer, once in the field, handles various processing tasks as it would at the garrison.

Data comes in from the combat divisions, for example, on the availability of troops for tactical decision-making or on inventory control to speed delivery of supplies to combat units.

Punched Card Problems

In the past, support units used keypunch equipment, which they also brought into the field for input to the mainframe. Under "combat" conditions, however, punched cards created their own particular problems.

"In a humid environment, the punched cards swell and cause jams in the reader," according to Lt. Col. Gerald Hicks, assistant chief of staff of management information systems for Coscom. "We also had trouble losing cards. In one cycle, we would use from three to five trays — or 9,000 to 15,000 cards — for input.

"Often, by the time the cards got from the keypunch truck to the mainframe, we would be missing a tray. Not only did this slow the cycle, but we were left with missing information."

In January of this year, Coscom's Material Management Center (MMC) replaced its four IBM 029 keypunches with an Inforex, Inc. Model 1303 key-to-disk system to handle its numerous transactions in overseeing the supply of clothing, repair parts and other commodities to the corps.

"We wanted to have state-of-the-art equipment and increase our productivity," Hicks remarked. "We checked out Inforex with people using its equipment, and they were pleased with it. The Army also has a requirements contract with Inforex, and we knew that would speed approval since we are the first tactical unit to use such a system."

According to Hicks, the transition from keypunch equipment to the key-to-disk system — with five workstations, processor, tape drive and card reader — went smoothly. "It's very easy to train the operators. We received the system in January, and our people were operating it within two to three days. We've experienced a 20% increase in our productivity rate; the error rate has decreased to almost zero."

Approximately 60% of the processed data coming into the MMC on keypunch worksheets is generated by Coscom's commodities unit, which receives and maintains an authorized stock list of items for supply to the various divisions. This information is used to identify stock, keep track of inventory on hand — its condition and place of storage — and list inventory on order.

Prepunched cards in the form of requisitions, status requests, delivery notices and so on make up the other 40% of input. These come in from supply units which deal directly with the combat divisions and from national inventory control points, which supply the stock for the commodities unit.

The information is processed on the mainframe's Standard Army Intermediate Level Supply (Sails) system and used to direct the flow of materials for the corps as well as generate reports to senior staff and agencies of the Department of Defense for analysis and policy planning.

System on Maneuvers

While watching the delivery of the Inforex equipment, Hicks and his maintenance technician got the idea to use the system on maneuvers, as they had the keypunch equipment. "When we saw that the miniprocessor was actually shipped via commercial carrier on casters and wrapped in a plastic bag, we wondered why we couldn't deploy and operate the system from a van as well as from the garrison.

"Chief Warrant Officer Ed Gidley, our computer technician who maintains the 360/40 and other electronic equipment, sat down and looked over the van and the system. Using whatever was on hand, including styrofoam, rubber matting, heavy nylon strapping and metal rings obtained from an airborne unit, Gidley worked out the details."

The system was strapped into the back of a standard M313 expandable van — a 2.5-ton truck whose body can expand by 4 ft on either side — and driven over 35 miles (approximately eight of which were unpaved) to the Camp McCall field location.

Usually, equipment like the key-to-disk system must be studied and tested by a battery of Army experts before it can be "authorized" for general Army use. However, since this process can take several months to several years, the Army has authorized use of off-the-shelf equipment to save time and take advantage of computer technology.

"We stay prepared to support any worldwide contingency," Hicks commented. "My feeling is that if we have the equipment that does the job — and does it well — then that's what we want to take."

Readiness Training Test

The eight-day field exercise for the corps included an operations readiness training test for the MMC and the 14th DP Unit. The units are given the setting and logistics of an operation in a particular world location, then expected to perform their required tasks from that location as they would on a contingency mission.

"We tried to go out with a positive attitude," Hicks noted, "but we did have a fear of failure. We were making an effort to protect against any failures on our part, and we wanted to learn some lessons on what problems to expect in the future."

The key-to-disk system provided benefits in the field as well as at the garrison. "With the Inforex system we only handled one magnetic tape rather than trays of cards; it's faster and much easier to read into the computer," Hicks remarked.

"Operating conditions in the field were very poor," he commented. "The van was dusty, and the humidity was very high from almost daily rain. Temperatures ranged from the 70s during the day into the 40s at night. We used heaters and they put out some smoke — when they worked. When they didn't work, the equipment operated in near-freezing temperatures.

"Any of these conditions could have caused a system failure, yet the equipment continued to operate without any major problems. Overall, the test was a resounding success."

Coscom has ordered another Inforex 1303 for its personnel service center and eventually will get a distributed processing system for even greater availability of management information.

The Inforex system offers more than cost savings; it offers combat readiness. "With the sophisticated weapons systems in use, as well as helicopters, trucks and tanks, a failure or even a delay in getting supplies to a unit could mean a tremendous loss of combat effectiveness in a short amount of time," Hicks concluded.

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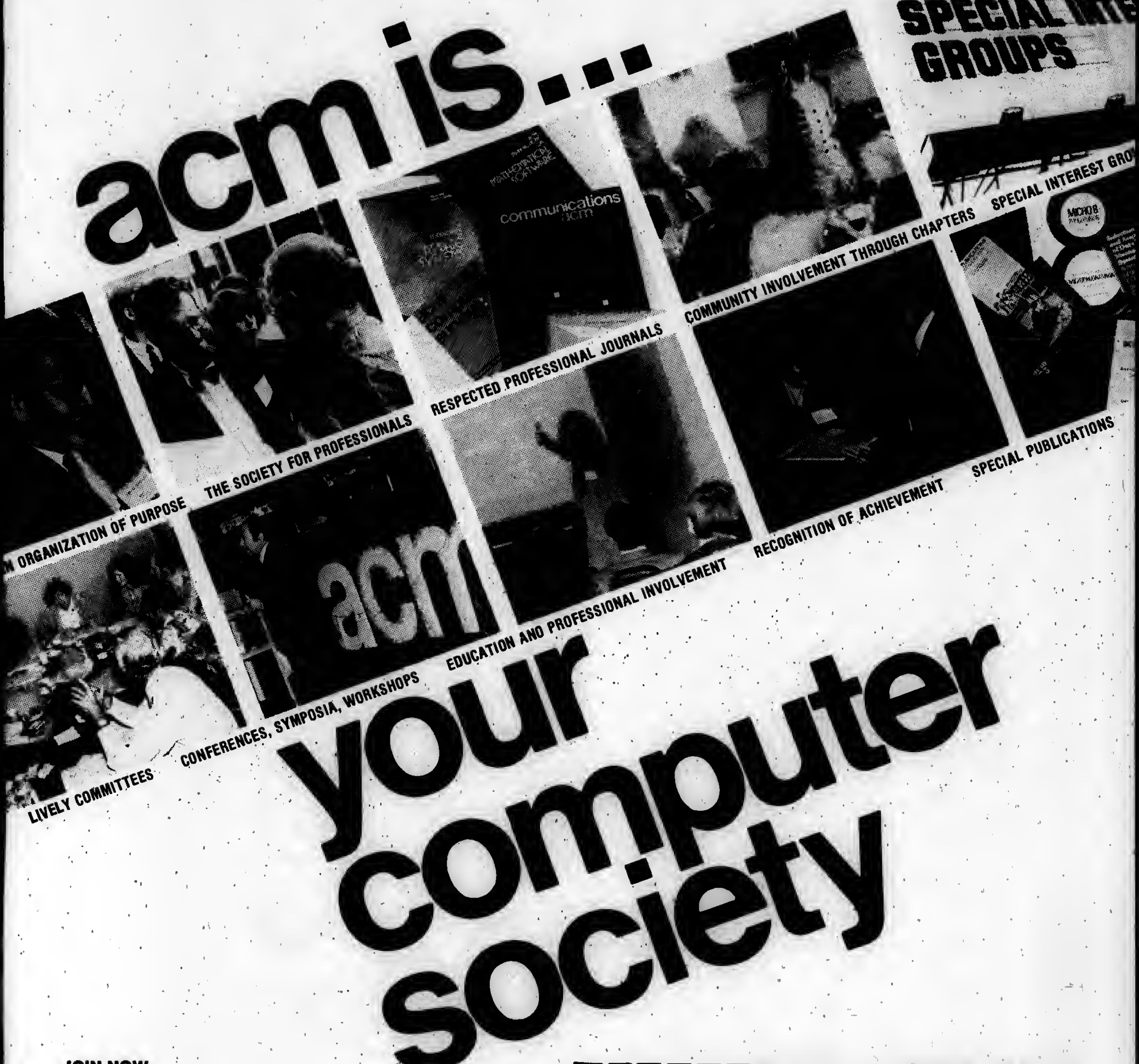
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Service Tracks Each Vehicle in Corporate Fleets

(Continued from Page 59)

200,000 vehicles. Data on each vehicle is current to within 24 hours.

Typically, an operator keeps a car in a fleet for about 28 months before selling it; trucks are usually kept longer. In order to meet tax and other reporting requirements, Gelco retains information about the vehicle on-line for a year after it leaves the road or is sold. After that, while not required to update the data about the vehicle, it keeps the information on microfiche for several more years.

"Once the basic decisions on quantity, manufacturer, models, destination and financing terms have been determined, computerized transaction processing takes over," Lever explained. Gelco's staff enters the customer order using a CRT; some details relating to options are entered later, according to parameters predetermined by the customer.

Once the vehicle order for an entire fleet is recorded in the system, Gelco's system completes the order by adding preference information such as color, then relays the order directly to the manufacturer in Detroit.

"It's all computer-to-computer from this point," Lever said. "The system has been programmed to emulate a data entry device within the automobile manufacturing firm. Thus, when we ordered 4,300 automobiles from a single manufacturer over three evenings and fixed the delivery schedules with each factory closest to the final destination, our system communicated with the manufacturer's computer with no problems."

Gelco also tracks each vehicle through the production cycle, monitoring its status until it is finally delivered to the dealer nearest the customer's employee who will operate the vehicle. Once a serial number has been established, Gelco starts the registration process with the state in which the car will be based, he said.

Data Base Integrity

Data security provisions have been established between Gelco and the auto companies. Gelco customers who have terminals of their own and who have appropriate data identifiers can dial into the Gelco computer to check the status of individual vehicles on order. "This capability, however, is on a 'read-out only' basis," Lever noted.

"To change the specifications on an individual vehicle, the customer must notify Gelco," he added. "Thus the integrity of the data base is protected, assuring a minimal amount of interruption to the entire fleet order and preventing unauthorized tampering with sensitive information."

The entire operation from vehicle selection through order and delivery schedule determination is called the Direct Order Entry System (Does). The Does software was developed by Lever's 25-person programming department to take advantage of Honeywell communications (Network Processing Supervisor), data base (Integrated Data Store/II) and program development (Management Data Query System) executive software systems.

The Network Processing Supervisor coordinates network communications over 25 lines among Honeywell CRTs, teletypewriter units and a Honeywell Level 6 Model 43 located in Toronto. That minicomputer is used for document entry and fleet maintenance of vehicles in the Canadian market.

The company's 384K-word system includes eight tape units, 24 disk units containing 200M bytes of mass storage each and printers, readers and punches.

Does was implemented first in 1975, when Gelco installed its first Honeywell Level 66 system. In 1977, the order status retrieval system was introduced to give domestic customers up-to-date information on their vehicles.

Maintenance Management

Another service program, called Maintenance Management, encompasses regular service and emergency repairs. Using CRTs, mechanics make maintenance and repair decisions that take into consideration prices, quality, repair location, possible downtime and warranty coverage.

A combination of 14 Wats lines and nine local lines connect the maintenance administrators with fleet users throughout the U.S. on a 12-hour basis. Incoming call notices are directed to the administrator responsible for the appropriate geographic region, who then uses a CRT to retrieve the appropriate data before accepting the call.

"Using his mechanical background, information available from the calling driver and the vehicle's maintenance history, the administrator provides a preliminary diagnosis," Level explained. "A 50,000-firm vendor file is consulted for the reputable service facility nearest the driver, and an estimate is made of the cost of repair.

"Once the problem is diagnosed and the vehicle is in the proper repair facility, the administrator performs all negotiations necessary to issue a purchase order."

The maintenance administrator then generates a purchase order authorizing the work. The order contains an estimate and the name of the service facility.

"Without the computer, we'd never be able to provide these services for our corporate customers. Our capabilities and growth have been paced by the upgrades and improvements in computer services," Level said. "Otherwise, we'd be just another fleet leasing and management firm."

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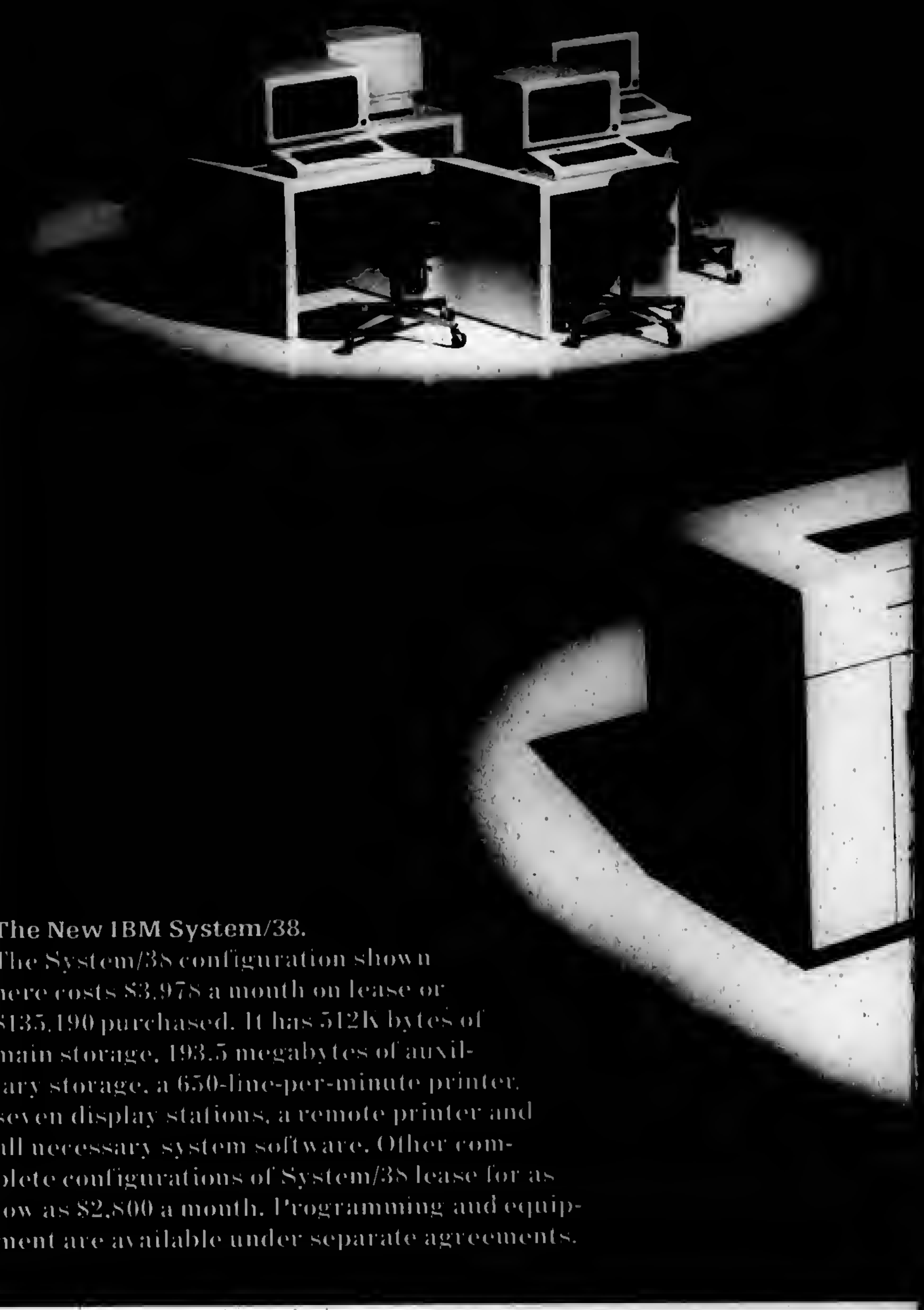

The New IBM System/38.
The System/38 configuration shown here costs $3,978 a month on lease or $135,190 purchased. It has 512K bytes of main storage, 193.5 megabytes of auxiliary storage, a 650-line-per-minute printer, seven display stations, a remote printer and all necessary system software. Other complete configurations of System/38 lease for as low as $2,800 a month. Programming and equipment are available under separate agreements.

IBM thought on a very big scale.

And System/38 can have a large impact in stepping up the efficiency and profitability of the organizations which use it.

Big computer functions in a small system

System/38 is designed to let any organization enjoy the productivity advantages of online applications typical of large-scale computers.

Specifically, IBM sought to incorporate in a simple-to-operate smaller system advanced functions that make work station applications easy to design, install and maintain.

Functions like an integrated online data base with data base management. Single level storage. Simplified computer-aided programming. Total system management through a central control facility. Real-time inquiry and update. Online training capability. Data integrity and security.

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Yet IBM System/38 has *all* the features listed above – and more. Not just some of them. Every one of them.

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Let's review them briefly.

Distributed online work stations

One of the biggest advantages of System/38 is that users don't have to come to the computer to get the vital information needed in their jobs. Instead, the computer comes to them where they work, by means of online display stations and printers called work stations.

As many as 40 local work stations – as well as additional remote work stations – can communicate with System/38 interactively. They can bring the power of the computer to people doing totally different jobs. At executive desks, in departments, plants and warehouses. Across the hall or across the country. And the same up-to-date information will be available concurrently to all authorized users for real-time inquiry, change or update.

The value of System/38 in keeping everyone up to date can scarcely be overestimated. It can mean hundreds of thousands of dollars saved in operating efficiencies.

A self-managed system

There are two aspects to computing: processing the data itself and managing the system that processes the data. System management can consume a great deal of expensive time and talent.

System/38, however, has a remarkable internal facility that eliminates much of the complexity of system management. Called the Control Program Facility, it monitors and manages system activity – including the flow and processing of data. As a result, users and programmers are free to concentrate on their own jobs, rather than worrying about how the computer performs its tasks.

Central online data base

Instead of having separate data files for each application – one for or-

Photo is of design models and display screens are simulated computer displays.

der entry, for example, and another for inventory – System/38 lets you combine data for related applications into a single online data base. The integral Data Base Data Management facility presents data in whatever format and sequence is required by the user.

Every user can be in touch with the same central source of information. When data is updated for one application – say order entry – it's available for all others using that information, such as production, shipping, accounts receivable and inventory. Duplicated and conflicting data can be eliminated. Information is easier to retrieve, revise and use.

Streamlined programming

Both new and experienced programmers will find their work simplified and speeded with System/38. Thanks to advanced technology, many functions that ordinarily require programming have been absorbed by the system.

For example, System/38 offers a powerful "query" function which can break out data in the data base as required by the user and present it in the desired sequence and report format – without conventional programming. Executives can use a work station at their desks to obtain special management reports in minutes, rather than days or weeks.

And with RPG III, an advanced version of the familiar RPG language, programmers are given new freedom to tailor processing of data and flow of logic to the needs of an application. Moreover, new application programs can be compiled, tested and "debugged" from any work station – in real time and using real data samples – while regular processing continues without being

More on System/38, turn the page ▶

affected. This means that a programmer is no longer burdened with manual coding, card punching and waiting for test time and results.

In short, System/38 can mean greater programmer productivity. Streamlined programming like this benefits both the programmer and the user who want results fast.

Single level storage

Another feature that makes for operating efficiency is an extension and simplification of the virtual storage used in larger computers. In System/38, IBM has taken this technique a big step further with the concept known as Single Level Storage Management.

It treats *all* storage – both main and auxiliary – as a single unit or level and automatically keeps track of everything stored in it. Users, particularly programmers, no longer need be concerned about program size or location or any other aspect of storage management.

Online training

As more employees become involved with the computer, training them in its operation becomes an important task. With System/38, your people can get "hands on" experience at live work stations, using actual data files – without fear of record destruction and without interfering with the use of the system by others.

And the prompting and guiding messages flashed on the screen can aid both trainees and regular users alike. There is even a "HELP" key for use whenever further assistance is needed.

Data integrity and security

System/38 provides an extensive range of security levels. They vary from simple basic precautions to an advanced plan which assigns a personal identification code to every user.

Under this plan, the information any individual can access, change or process is carefully designated and restricted according to a user "profile" stored in the data base. In a multiple work station environment, with large numbers of users, this kind of positive individual control can be particularly helpful in assuring the integrity and security of computer data.

Behind System/38: a technological breakthrough

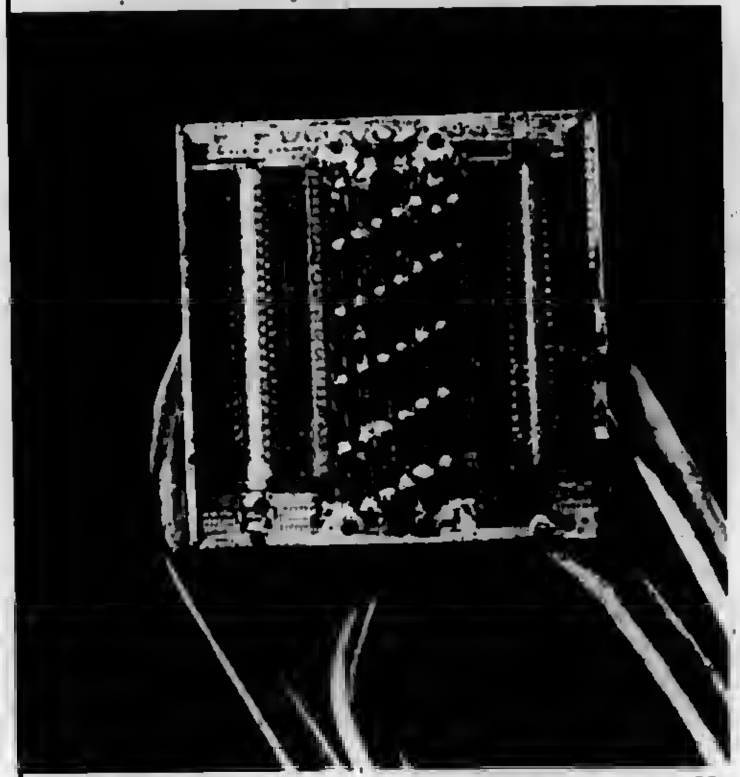
At the heart of the major price/performance improvements of IBM System/38 are two pace-setting technological advances.

The system's memory uses a new silicon chip technology with up to 64,000 "bits" or elements of information per chip. A speck of silicon less than one-tenth of a square inch in size, the 64K chip is the most densely packed chip yet employed as a standard computer component.

And in the processing section itself, System/38 uses a logic chip with up to 704 circuits – more than 25 times the capacity of the processor logic chips employed in IBM System/3.

But that's only part of the story. A totally new architecture, incorporating advanced features new in themselves, was developed for System/38. Through it, it became possible to shift some of the customary software of the computer operating system to internal handling by System/38 itself. In turn, the operating system took on functions that ordinarily call for programmers to write special instructions.

System/38 thereby relieves programmers of much tiresome and repetitive work. And the convenience of compiling, testing and "debugging" programs at work stations – interactively and in real time – can mean greater programmer productivity and faster computing results.



Shown about seven times actual size, a 64K chip is depicted on a paper clip.

Conversion from System/3

Conversion to System/38 from an IBM System/3 can be aided with conversion utility programs. They allow the user to do as much as possible of the conversion process on his System/3 prior to installation of System/38. These programs are designed to make conversion easier, faster and less expensive and protect the user's investment in software.

Growth with IBM support

Once installed, System/38 is designed to grow with your business. New capacity and components – such as added work stations or additional storage – can be attached quickly and easily, without recompiling existing programming to accommodate the new configuration. And most maintenance can be performed while the system continues to operate.

Moreover, wherever you're located – in midtown Manhattan or mid-Nevada – you know that IBM support is responsive. The IBM commitment to customer service goes far beyond simply supplying hardware. IBM *stays* with you.

With totally new architecture and dramatic advanced functions, System/38 can be an investment that will pay dividends for many years to come. To get the full story on System/38 and what it can do for you, call your nearby IBM General Systems Division office. Or write P.O. Box 2068, Atlanta, GA 30301.

A small computer can make a big difference. IBM®

Mini Bits

Interface, 64K Memory Replace Interdata Units

CRANBURY, N.J. — Users of the local memory bank interface system for Interdata's 7/32 minicomputer can reportedly replace that unit with a compatible memory bank interface system from Dataram Corp. Among its other features, the interface system operates with Dataram's recent 64K-byte core memory module that replaces its 64K-byte, single-board Interdata counterpart, according to a spokesman.

The interface system consists of a 14-in. rack-mountable chassis and an interface board that drives the chassis's memory modules. Like its Interdata counterpart, the system provides 16 slots for memory boards and assorted peripheral controllers.

Eight of these slots hold any of Interdata's current core memory modules or Dataram's 64K-byte DR-717 core memory boards. With all eight memory slots occupied by the DR-717 modules, the interface system stores a maximum of 512K bytes.

In addition to operating with the interface system and the 7/32 minicomputer, the Dataram 64K-byte core memory boards plug into the Interdata models 50, 70, 6/16, 7/16, 8/16, 8/16E and 8/32 minis, the source added. Available in 32K-byte as well as 64K-byte configurations, the memory modules cycle in 750 nsec and allow users to set parity through an on-board DIP switch.

The interface system costs $4,800, compared with $3,040 for the 64K-byte DR-717 and $1,985 for the 32K-byte version. Dataram is located at Princeton-Hightstown Road, Cranbury, N.J. 08512.

Papers Sought for Mini Symposium

DALLAS - The Association for Computing Machinery has issued a call for papers to be presented at its Second Annual Symposium on Small Systems, which will take place Oct. 1-3, 1979, at the Hilton Inn here.

Authors who wish to present papers at the symposium, nicknamed Sigsmall '79, should submit their completed texts by April 1, 1979, according to conference officials. Topics to be covered at the symposium will include business and industrial applications for microprocessors, small system applications in entertainment and education, distributed processing with small systems and minicomputer and microcomputer software advances.

Prospective speakers should send abstracts to Dr. Fred Maryanski, Computer Science Department, Kansas State University, Manhattan, Kan. 66506.

Controller Links to Dual-Head Disks

SUNNYVALE, Calif. — Users of dual-head, double-density disk units can reportedly connect their equipment to Data General Corp., Digital Equipment Corp., Hewlett-Packard Co., Interdata, Varian and other vendors' minicomputer systems with a disk controller from Advanced Electronics Design (AED), Inc.

Besides supporting 1.2M bytes per diskette, the 6200LD provides a programmable format, MFM recording, eight interfaces, cycle redundancy check, initial program load and drivers for DEC PDP-11 and LSI-11 processors, according to an AED spokesman. In its 7-in. high cabinet, a standard 6200LD incorporates two disk drives to which users can add two additional drives.

Available with drives or in kit form, the controller costs $2,000 in OEM quantities and can be ordered from AED at 440 Potrero Ave., Sunnyvale, Calif. 94086.

Systems Outdo Series/1, Sell for Half the Price

By Jeffry Beeler
CW Staff

CINCINNATI — Computer Systems Development, Inc. (CSD) has coupled 16-bit microprocessor technology with an integrated software system to produce a Series/1-like small business system family that reportedly delivers an average of 25% more processing power than its IBM equivalent for roughly half the price.

The introduction of the Sentinel series marks the first use of Intel Corp.'s 16-bit 8086 microprocessor chip in a commercial system, a CSD official claimed. He cited the 600-nsec device as one reason for the line's reported price and performance advantages over the Series/1.

CSD, formed earlier this year after Cincinnati Milacron, Inc. shed its Electronics Systems Division, also credits the Sentinel family's competitive edge to its software system, which was developed for the Champion International, Inc. paper company by Cincinnati-based Tominy, Inc. Named Champion Distributed Processing System (CDPS) by its developer, the software integrates an operating system, a Cobol-like programming language tentatively known as Champtalk and utilities plus a "full-function," multitasking data base management system, according to the spokesman.

With CDPS, users can reportedly compile application programs on a Series/1 processor and then run them on a Sentinel series

(Continued on Page 82)

One of four members of CSD's Sentinel line, the Model 30 can provide either stand-alone DP capability or replace the IBM Series/1 in 370-based distributed processing networks.

Exec Urges Regular Checks Of DP Security Procedures

PISCATAWAY, N.J. — Because minicomputer fraud has become an accepted fact of life, DP security systems require periodic evaluation to ensure they continue to meet their users' needs, according to Systematics, Inc. marketing manager Robert Lawrence.

Security systems installed several years ago may have grown "totally inadequate because of changes resulting from expansion or in the configuration of the computer facility," warned Lawrence, whose firm makes an identification card system that controls access to DP sites.

"Usually revisions are made when some fault is detected, which may be too late. Periodic reevaluations of security personnel, systems and hardware are mandatory if the new sophistication in computer fraud is not to continue to take an unacceptable toll," Lawrence said in a recent interview here.

Although users can discourage computer crime with the right combination of hardware and software, that precaution alone constitutes only a partial remedy to a growing problem. To safeguard computerized data bases from theft or misuse, users must also carefully restrict employee access to computer facilities and the sensitive files they contain, he maintained.

Whether their hardware manages competitive business information, national defense data, personnel files or financial and accounting data, users must rigorously screen each DP employee before authorizing that individual as a systems operator or manager.

Particular care should accompany the screening of high-level employees, Lawrence urged. Personnel knowledgeable and technically proficient enough to purloin printed or magnetically stored data are usually not found in the lower DP echelons but among top administrators, whose positions demand almost unrestricted access to a company's confidential data files.

Unfortunately, many users balk at the suggestion that they scrutinize prospective DP employees more closely, and this reluctance particularly applies to those high in the corporate computing hierarchy, he said.

Why the Reluctance?

Why do many users feel so uneasy about investigating a job applicant's background and evaluating his character? Part of the squeamishness stems from an unwillingness to admit that "personable and clubbable" professionals would commit on-the-job crime, Lawrence said.

The reluctance also stems in part from the psychological need to support members of "the team" and give them every benefit of

(Continued on Page 74)

Cassette Recorder Debuts

NEWTON UPPER FALLS, Mass. — Using its read-after-write capability, a cassette recorder from Memodyne Corp. allows users to monitor data as it is written and thus ensure integrity, a spokesman said.

The Model 764-8EU also reportedly accommodates variable block lengths and provides an automatic reversal feature that permits users to record on both of the unit's recording tracks without reversing.

Compatible with American National Standards Institute and European Computer Manufacturers Association tapes, the recorder rewinds and searches at 100 in./sec, records and plays back at 800 char./sec and stores a maximum of 2.2M bits, equivalent to 1,600 data blocks/track, the spokesman said.

In OEM quantities, the recorder costs $865 and is available from Memodyne at 385 Elliot St., Newton Upper Falls, Mass. 02164.

Memodyne 764-8EU Recorder

Memory System's Capacity Three Times That of MJ11

IRVINE, Calif. — Although it occupies half the space of the Digital Equipment Corp. MJ11 core module, an MOS memory system from Plessey Peripheral Systems, Inc. reportedly provides three times the capacity of that DEC counterpart.

Intended for the DEC PDP-11/70 system, the PM-SJ11 comes in two standard versions: a 256K-byte model expandable to 1.5M bytes and a 128K-byte model expandable to 768K bytes, according to a Plessey source.

Other features include error correction code, which spots and rectifies memory errors before they go to the CPU, and an error logging register (ELR), which records errors that arise during memory access.

With the ELR feature, the PM-SJ11 provides the address and bit locations for single-bit errors and address information for double- and multiple-bit errors, the spokesman continued. The system then displays these errors on its control panel, which uses colored indicator lamps to distinguish between single- and multiple-bit errors.

The memory system's main modules include one to six memory boards and two controller boards, which provide parity control, error correction, memory timing and error logging circuitry, plus an electrical interface for the PDP-11/70 main memory bus.

These modules as well as an integral power supply, cooling mechanism and front panel fit into a 5.25- by 19-in. chassis that mounts in the CPU's memory bay, the spokesman explained.

A fully equipped 256K-byte version of the PM-SJ11 system costs $10,055 from Plessey at 17466 Daimler Ave., Irvine, Calif. 92714.

Exec Advises Regular Checks

(Continued from Page 73)

the doubt. A third factor is the fear that overly rigorous screening methods might send job candidates running to the competition.

Finally, users fear poor community relations — the company gets the reputation of being paranoid on the question of security, he added.

The syndrome that brings insufficiently examined professionals onto the scene is easy to describe, Lawrence said. A candidate approaches a prospective employer highly recommended by a friend or acquaintance of a manager.

References are checked cursorily, and if one or two cannot be located, they are not pursued. As a result the employee gains authorized access to critical information without undergoing adequate screening, he explained.

To rectify this potential problem, users need not institute special "star chamber" procedures, but instead, establish a firm management policy for all job candidates at management, professional and security levels, he recommended. This program should be spelled out in printed form proclaimed to every job applicant.

It should state that all references will be thoroughly checked and any discrepancy, however seemingly trivial, will need to be satisfactorily explained.

All candidates in these categories should be subject to professionally structured lie detector tests, and failure to comply with this requisite should effectively bar the candidate from further consideration, Lawrence asserted.

These precautions become onerous only when they are selectively applied and thus appear directed at particular individuals. When they are universally applied, no one can justifiably charge discrimination, and security is certainly enhanced, he said.

Although Lawrence conceded his suggestions might sound drastic, he justified them as necessary for national security and corporate survival.

Looking back.
And ahead.

All indications have it that 1978 will go down as another banner year for the computer industry. User spending for 1978 should at least match the IDC — projected $42+ billion, up 15% from 1977. Budgets in almost every major category show increased growth over 1977, and 1979 is shaping up to be a repeat performance.

Our December 25/January 1 Combined Issue Special Report takes a look back at the year in computers, as well as a look ahead for 1979. The *Computerworld* editorial staff will take a break from the holiday season just long enough to give you some hindsight and foresight on topics like:

- *The impact of inflation on computer use and configuration*
- *User-vendor relations*
- *Market trends — products projections for '79*
- *The year in court — IBM and Memorex*

If you're concerned with the trends in the computer industry, you won't want to miss our Year-End Review and Forecast. And if you market products for the computer world, here is a good place to advertise. Color close is December 8; black and white close, December 15. Your *Computerworld* representative can give you all the details, and assistance in ad planning. Or, to reserve space, call Terry Williams at (617) 965-5800.

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REGINA, Sask. — The cost of maintaining a telephone service order system at Saskatchewan Telecommunications, Inc. has shrunk by more than $16,000/mo since the firm implemented a distributed system that links corporate headquarters to key departments in eight of this Canadian province's cities.

Designed to provide overnight processing of changing customer data, the telephone service order network incorporates a central 192K-byte Digital Equipment Corp. PDP-11/70 minicomputer linked in a star configuration to eight 124K- or 96K-byte PDP-11/34s, one here and one in each of seven district offices.

In addition to linking the remote computing sites with Sask Tel's marketing and customer billing divisions here, the Information Gathering, Retrieval, Editing and Distribution (Ingred) system transmits data between 92 terminals in the district offices' commercial, plant assignment, plant dispatch, warehouse, traffic and directory services departments.

Before it installed the Ingred system early this year, the company wrote service orders for this city and Saskatoon by hand, punched the order data onto paper tape and then verified and transmitted the orders to headquarters through a 300 bit/sec teletypewriter network, Sask Tel's systems and programming supervisor Bob Hockings recalled.

The company forwarded service orders from smaller districts by mail. At the main office, clerks punched paper tapes, which they then converted to magnetic tape for batch processing on an IBM 360/50.

Turnaround Too Long

Under this earlier system, however, the phone company had to endure unacceptable turnaround times and experienced significant encoding or transmission errors, Hockings explained. Printing orders and mailing them to the appropriate departments typically took three to four days.

Even longer delays occurred during the winter months when storms hindered mail delivery.

Realizing that their previous system no longer suited a firm where service orders totaled 240,000 a year and volume grew 10% annually, Sask Tel officials decided to search for an alternative.

In traditional service order systems, phone companies either link remote terminals to a central mainframe or rely on service bureaus. After considering both alternatives, Hockings concluded that "implementing such systems was beyond the rational economic resources of the company. It was apparent that all companies with these systems had a larger subscriber base than Sask Tel, in a much more densely populated geographical area."

As a result, the company opted instead for a distributed minicomputer network with remote processors and terminals linked to a headquarters minicomputer. Such an alternative would cut operating costs and provide remote computing capabilities, Sask Tel officials reasoned.

Moreover, if any part of the distributed network malfunctioned, the rest would remain unaffected.

After investigating several prospective minicomputer-based networks, the phone company finally chose a Digital Network (Decnet) system from DEC. That hardware was chosen over rival systems primarily because DEC's "broad minicomputer line offered a selection of equipment to suit both large and small districts," Hockings explained.

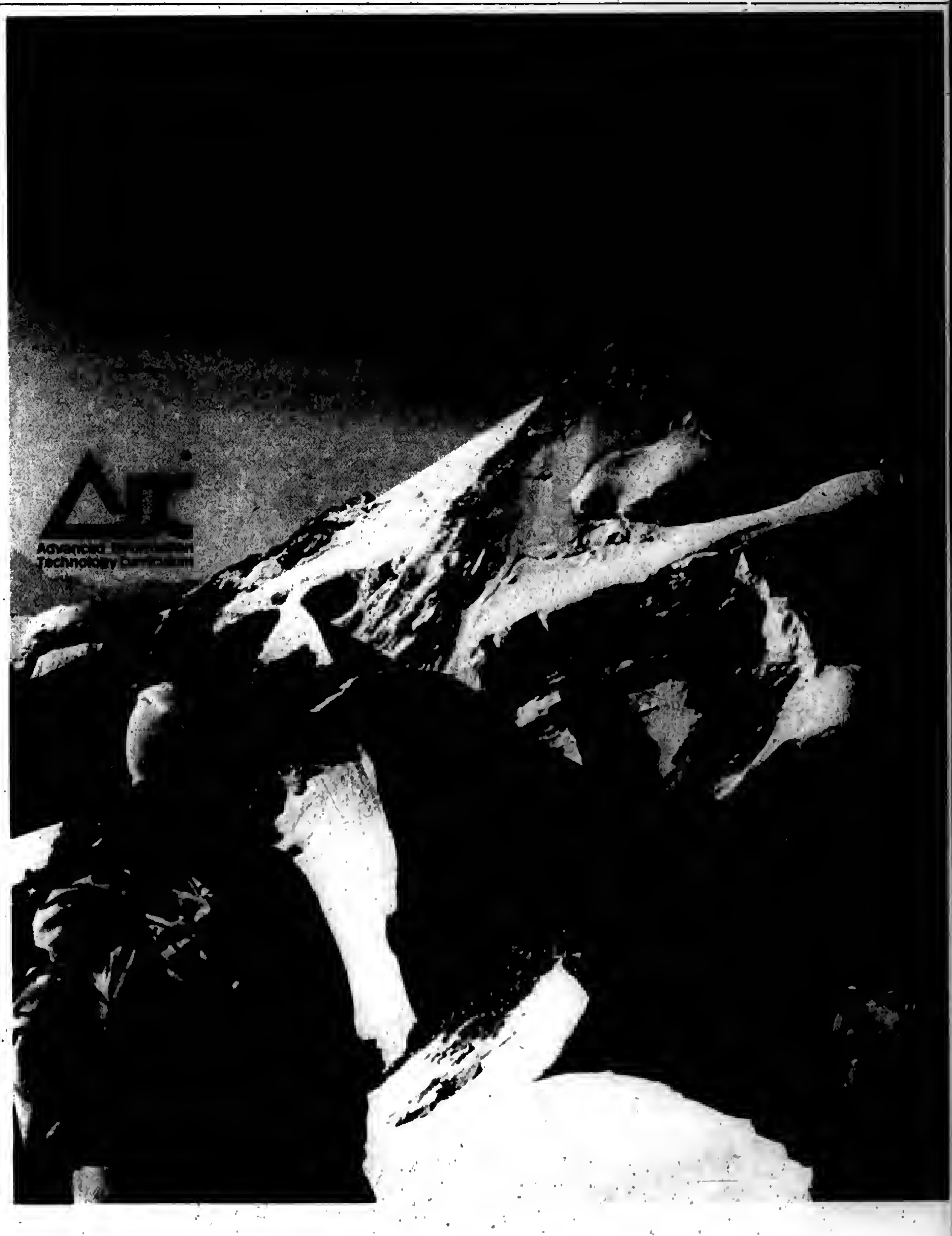
Moreover, "the Decnet software provides the communications capability to support our internally developed applications programs."

At corporate headquarters, the central PDP-11/70 supports two 88M-byte DEC RP04 disk units, two DEC LA180 printers, two 800 bit/sec TE16 tape units, one LA36 Decwriter II and one Vucom 3 CRT terminal.

At the Saskatoon office, a 124K-byte PDP-11/34 supports three 5M-byte RL1 disk units and 13 CRT terminals plus 12 printers and printing terminals.

Each of the remaining PDP-11/34s at the smaller Yorktown, Prince Albert, Swift Current, North Battleford, Moose Jaw and Weyburn district offices incorporates a 96K-byte main memory and supports two 2.5M-byte RK05 disk units, three LA36 printer terminals and four Vucom 3 CRTs.

Each remote system uses a Decnet protocol to communicate at 4,800 bit/sec with the central minicomputer.



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Retailer Adds System, Eliminates Record Loss

BOSTON — Besides improving its financial and merchandise control, a large local department store has eliminated misfiled and lost purchase orders, receipts and sales checks by switching from manual recordkeeping to an on-line minicomputer system.

Allied Stores Corp. earns $1.9 billion per year by supplying merchandise to 175 department stores in 27 states. Each of those stores offers products ranging from apparel and cosmetics to housewares and furniture.

One of its department store clients is Jordan Marsh Co., a well-known New England retailer for many years. Jordan Marsh shipments arrive at its one million sq-ft warehouse in North Quincy, Mass., for delivery to 16 stores and thousands of customers throughout Massachusetts, Rhode Island, Maine, Connecticut and New Hampshire.

One of Jordan's most challenging management problems arises in the home furnishings area, notably in furniture and major appliances. This area requires broad support in purchase order management, customer service, inventory control and timely management information.

Big Ticket System

The equipment that provides this support is known as the big ticket system. The real challenge with any big ticket system lies in satisfying the often conflicting requirements of salespeople, customers and warehouse and delivery personnel.

To provide Jordan Marsh with such comprehensive support, Allied looked to computerization to replace its manual DP system. Before June 1977, Jordan Marsh maintained a customer history file by retaining all its sales checks, according to Steve Nezer, Allied's project manager for DP systems.

"When a customer telephoned with an inquiry, someone would have to search through the files for a copy of the sales check," Nezer recalled. "It was a long process that did not allow us to respond immediately to a query."

With 60 to 70 daily calls that ranged from reserving a piece of merchandise to complaining about a product defect, the manual system proved untenable.

"With so many transactions, misfiling was not uncommon and records could be lost forever," Nezer said.

In addition, the volume of paperwork and filing continually increased, Nezer explained, because of Jordan's policy of maintaining active and inactive sales check files for several years. "Stock locator cards were also held on file so we could respond to questions concerning missing merchandise for up to six months after a sale," he noted. Beyond that time, the sales check was the only record.

Wanted It All

"We wanted a cost-effective system that could satisfy all our complex needs, yet be simple to program and operate," Bill Stapleton, Allied's DP director, explained.

By closely watching developments in the minicomputer market, Allied became aware of Wang Laboratories, Inc.'s intention to introduce its VS system last year. The VS system seemed to satisfy all of Allied's "wish list" requirements, and a prototype was installed at Jordan's North Quincy warehouse in June 1977.

"It became operational within a week," Stapleton said. In addition to a 2200 VS processor, the system includes two 600 line/min Model 2263 printers, one 120 char./sec Model 2231 matrix printer and 21 interactive workstation terminals.

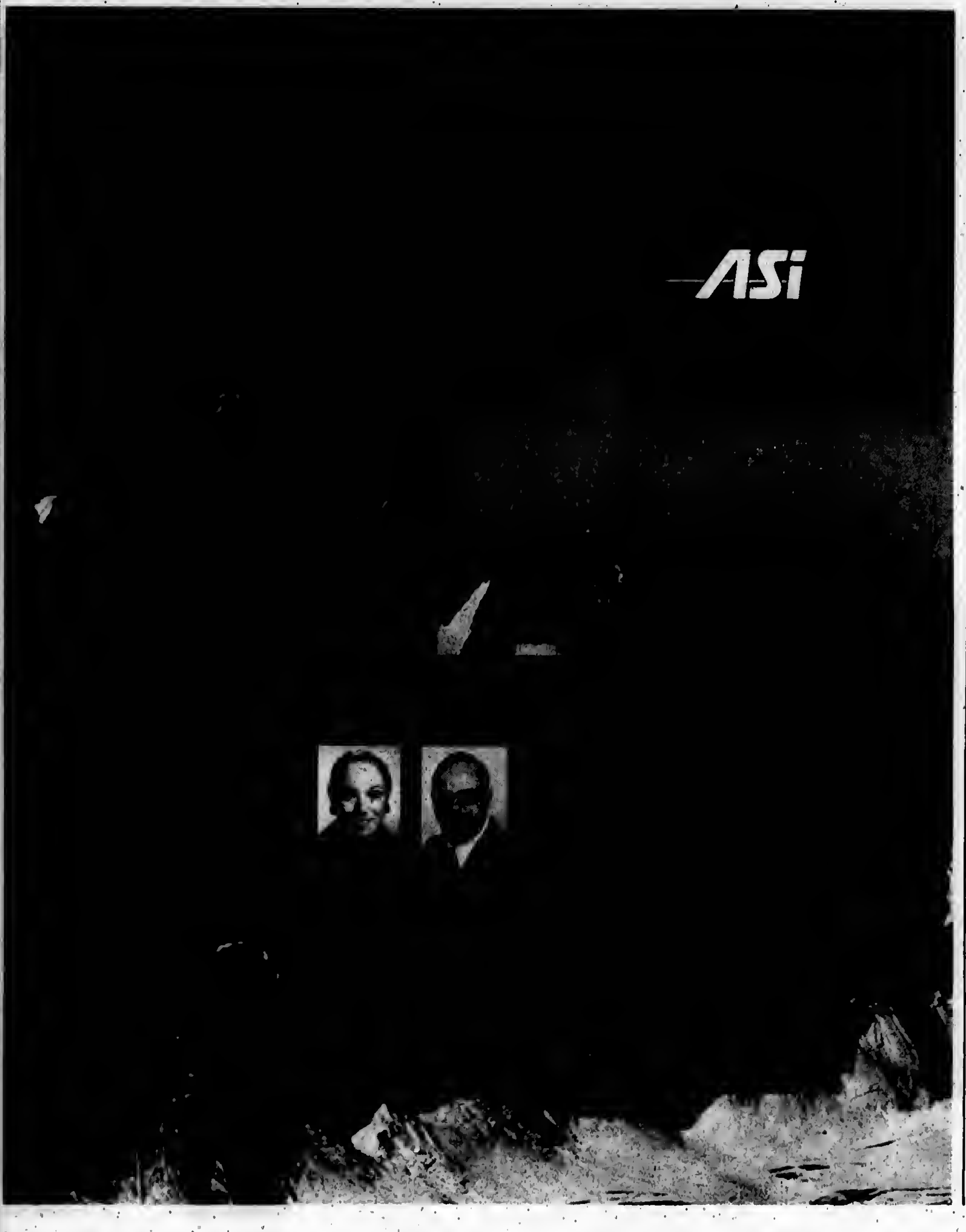
Approximately 50 purchase orders per day are generated by Jordan's big ticket buyers. An original goes to the vendor, and a copy goes to the Central Control Unit (CCU) in the distribution center.

Purchase order information at the CCU is then keyed into the system at one of the VS workstations and stored for future use. As new merchandise is received at the warehouse dock, the receiver sends a packing slip by pneumatic tube to the CCU.

"The VS prints a copy of the purchase order for checking to ensure that all quantities and styles in the original purchase order match the merchandise received," Nezer explained. The information is then automatically updated in the system's data base.

After merchandise has been checked in, data about problems and damages is input into the system for a permanent record. The Model 2263 then prints four-section tear-apart merchandise tags listing ID number, description and warehouse or store destination information for each item.

All merchandise status information, which indicates whether an item is on hand or on order, is immediately accessible to any of Jordan's home furnishings salespeople at any of its stores.



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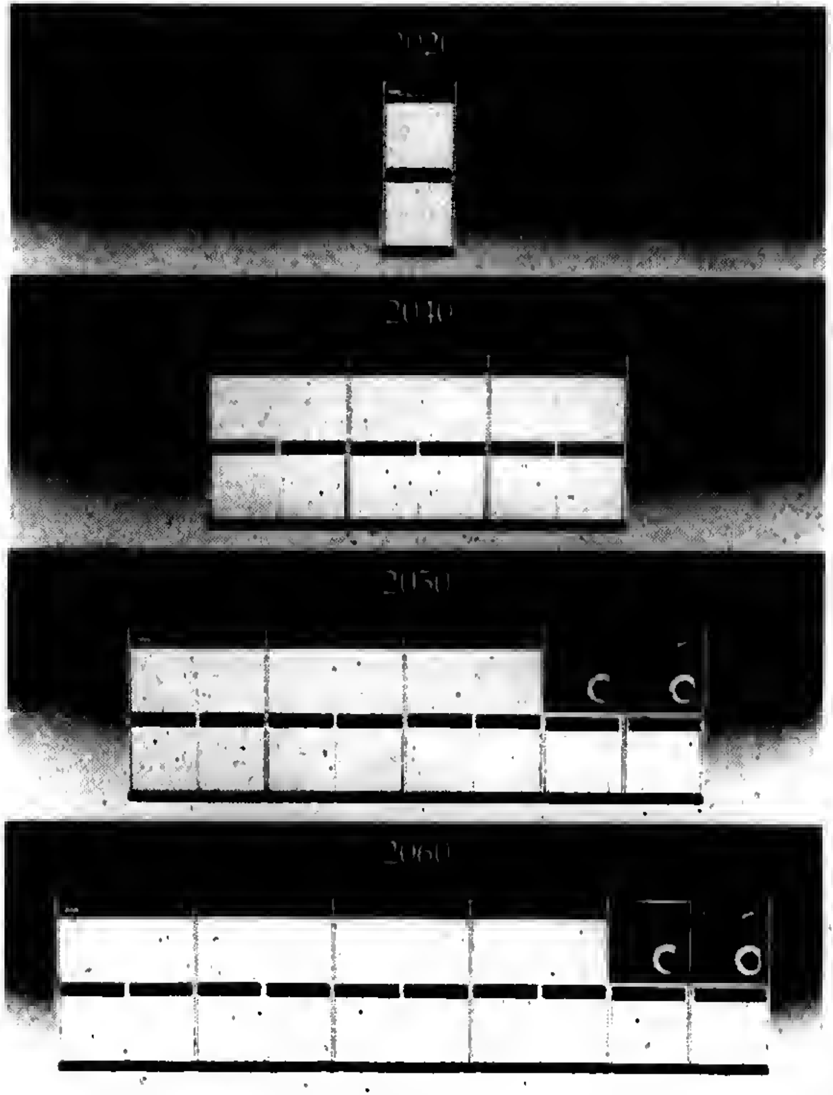

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Micros Tighten Car Dealer's Business Control

AUGUSTA, Ga. — Rather than having to endure processing delays as long as one day, a user here can obtain key information about its business activities almost immediately and correct errors just as quickly, thanks to two in-house microcomputer systems the company installed recently.

Spokesmen for Bob Richards Chevrolet, one of this state's largest automobile dealerships, credited the dual micro systems with tightening management's control over its business operations. Unlike most mainframes and some minis, which are physically separated from their users, Richards' systems literally operate alongside the clerks, mechanics and accountants who rely on them.

Built around two 64K-byte Pertec Computer Corp. Mits microcomputers, the systems perform general accounting functions, maintain sales records and control and the spare parts inventory for the auto dealership's service department.

Looking for Control

Before Richards acquired the current systems, its only involvement with computers was through accounting service bureaus that managed the company's billings.

"But with sales exceeding 2,000 cars and trucks a year and a parts inventory in excess of 10,000 part types, some sort of system to bring things under tighter control was needed," dealership owner Bob Richards recalled. "The problem was that almost every system we looked at — mostly minicomputer-based or time-shared mainframes — seemed to remove more and more control from the dealership."

For a year and a half, Richards searched for his firm's first in-house DP system, only to discover to his frustration that the more expensive the hardware, the less control he felt he would have over it, particularly its costs.

To increase Richards' frustration, most of the minicomputer systems he considered threatened to swell his costs rather than reduce them. For the jobs he wanted done, a minicomputer would have cost at least $20,000 and the software another $20,000 to $30,000, with additional hardware and software maintenance costs of about $400 to $500 a month.

"Once we committed ourselves to a system like that, we would have been wedded for life," Richards observed.

Two Different Micros

But with the help of the Computer Systemcenter of Atlanta and consultant Dale Wingo of Aiken, S.C. - based Sandlapper Systems, Inc., he finally found and subsequently bought the two Mits microcomputers, one of which is dedicated to bookkeeping and accounting and the other to parts inventory control.

"I expected to spend $40,000 for a single system," Richards explained. "Instead, I got two systems for a little more than half that cost, and they do the job of some systems costing $80,000 to $90,000."

In addition to the two processors, the system incorporates three Hazeltine Corp. 1500 CRT terminals, two 10M-byte hard disk units and a 120 char./-sec Decwriter III printer that is shared between the two applications. The system also uses a Basic language system called Disk Extended Basic.

Richards and his consultant opted to do all the programming themselves rather than buy ready-made programs. "Compared with some of the standard software packages offered by some minicomputer firms, the Mits software was incredibly inexpensive," Richards recalled. "We felt the applications were unique enough that it would be to our advantage to write programs tailored to our specific needs."

Accounting Subsystem

The accounting subsystem, in addition to the standard functions such as general ledger, accounts payable, accounts receivable and payroll, performs jobs unique to the auto sales business. Some of these jobs include maintaining vehicle inventories, producing repair orders and keeping daily, weekly, monthly and yearly sales records broken down by salesman and auto number.

The system is programmed "to keep track of each customer after he has bought a car, and it notifies the dealership on the birthday of the customer, the anniversary of the sale and when servicing is necessary," the consultant explained. "It even prints out the cards that can be sent to the customer."

In operation, the subsystem's disk storage unit is initially loaded with the data about member accounts. At the end of each day, all transaction data is entered to update the disk file.

To provide the dealership's management with a day-to-day reading of business activities, the system automatically prints a daily operation control report. The accounting subsystem hardware consists of a CPU, memory, disk unit and shared printer, whereas the parts inventory subsystem incorporates two CRT terminals in addition to the other units.

"One CRT is located on the customer counter for the clerk and one in the repair area for the mechanics," Wingo said. "Each time a mechanic uses a part in an auto being serviced or a clerk sells a part, each is required to fill out a simple form that appears on the CRT terminal. The system then updates the inventory list, checks inventory and lets management know when it is time to order new parts."

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Memory Subsystem Bows

READING, Mass. — Two processors can independently access up to 1M byte of common virtual memory with a multiprocessing memory subsystem from Datacube SMK, Inc., the vendor said.

Compatible with its National Semiconductor Corp. counterpart, the random-access RM-117 subsystem provides a 20 bit-wide internal memory address that is generated either through virtual memory or through its dual Intel Corp. Multibus interfaces.

The dual-port memory subsystem reportedly contains on-board control logic; and it provides control and memory mapping functions through I/O output commands to eight contiguous addresses. With access contention transparent to the user, the subsystem cycles in 350 nsec for one port and in 750 nsec if users simultaneously access both ports.

The RM-117 costs $1,200 each and $995 in quantities of 10. Datacube is at 670 Main St., Reading, Mass. 01867.

Series of ac Power Conditioners Protect Gear From Line Surges

PLAINVIEW, N.J. — Users can reportedly protect their minicomputers, microcomputers, point-of-sale terminals, word processing equipment and other sensitive electronic units from more than 99% of a power line's surges, spikes and high-energy transients with a series of ac power conditioners from Pilgrim Electric Co.

The three Voltector Series 5 conditioners include the Model 7872, at 1A and 120 Vac; the Model 7873, rated at 2A and 240 Vac; and the Model 7874, rated at 3A and 360 Vac, according to a Pilgrim Electric source.

By limiting 2,500V spikes to safe levels, the three units allow users to run their computer hardware with primary power lines and thus eliminate the trouble and expense of installing dedicated lines.

All three models accommodate 60 joules of transient energy and are said to provide both common and transverse model protection against pulsed, continous and intermittent power line noise.

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The models 7872, 7873 and 7874 cost $142, $147 and $156, respectively, and are available with a five-year warranty from Pilgrim Electric at 29 Cain Drive, Plainview, N.J. 11803.

Systems Outperform Series/1

(Continued from Page 73)

system or vice versa. The integrated software system, which IBM is expected to introduce this month as a Series/1 installed user program, also allows users to write and compile programs on any 370 series model and then download them to a Sentinel system.

Thus, the software permits the CSD family to replace Series/1 systems as remote processors in 370-based distributed computing or distributed data base management networks, the official explained.

But despite its networking capabilities, the Sentinel systems line will primarily serve as a stand-alone DP product, he stressed.

The Sentinel family systems come in four versions: the Models 10, 20, 30 and 40, which differ primarily in the peripherals and peripheral controllers they incorporate.

All four models incorporate the same CPU and, because of their microprocessor technology, accommodate up to 1M byte of main memory. In addition to an 8086 microprocessor, the Sentinel's CPU incorporates an Intel 8085-based controller that permits the CSD small business systems line to interface up to eight of Shugart Associates' latest disk units, including four of the company's 800K-char. floppy disk systems and an equal number of its 14.5M- or 29M-byte Winchester hard disk units.

A standard Sentinel desk enclosure provides enough space to accommodate up to four 800K-char. floppy disk units and up to two 29M-byte Winchester disk units for a total capacity of more than 60M bytes. With additional cabinetry, the business systems family can support more than 120M bytes of mass storage per control board. Moreover, the CSD series can accommodate several of these controllers simultaneously, the spokesman said.

In a basic configuration, each of the four Sentinel models incorporates a CRT terminal controller that accommodates up to four CRT displays. With multiple interface boards, the systems typically include 16 terminals, he added.

A standard Model 10 system serves primarily as an intelligent data entry station and incorporates a minimum of 32K bytes of main memory with a 1,920-char. CRT terminal and two dual-density 800K-char. floppy disk units or optional 1.6M-byte floppy systems.

The standard Model 20, by contrast, mainly suits stand-alone DP and provides at least 64K bytes of addressable memory plus a choice of 150-to-180 char./sec printers. Otherwise, the Model 20 includes the same hardware modules as the bottom-of-the-line system.

Like the Model 20, the Model 30 requires at least a 64K-byte central memory. But unlike its floppy disk-based sister system, the Model 30 incorporates a 14.5M-byte Winchester hard disk unit as standard equipment as well as a 300 line/min printer. A standard Model 40, meanwhile, provides 29M-byte Winchester disk systems plus a 300 line/min printer and a 64K-byte minimum main memory.

Users can upgrade their systems within the Sentinel line by merely plugging the appropriate memory and controller boards into their CPU chassis, the official explained.

The four CSD models will typically perform standard financial accounting functions for businesses whose annual revenues total $100 million or less, he noted.

Among its communications features, the Sentinel family offers two controllers that permit asynchronous and bisynchronous transmissions at up to 9,600 bit/sec. The bisynchronous control board incorporates a microprocessor that reportedly accommodates IBM 2770, 2780 and Hasp remote job entry workstation communications.

Application programs now available with the CSD small systems line include four horizontal software packages for accounts receivable, accounts payable, general ledger and payroll. In addition, the vendor is said to be currently developing two packages for the construction industry and certified public accountants.

Basic Model 10, 20, 30 and 40 configurations cost $9,950, $19,900, $24,900 and $34,900, respectively, with leasing arrangements available. First shipments of all four Sentinel versions begin in January from CSD at 4154 Crossgate Drive, Cincinnati, Ohio 45236.

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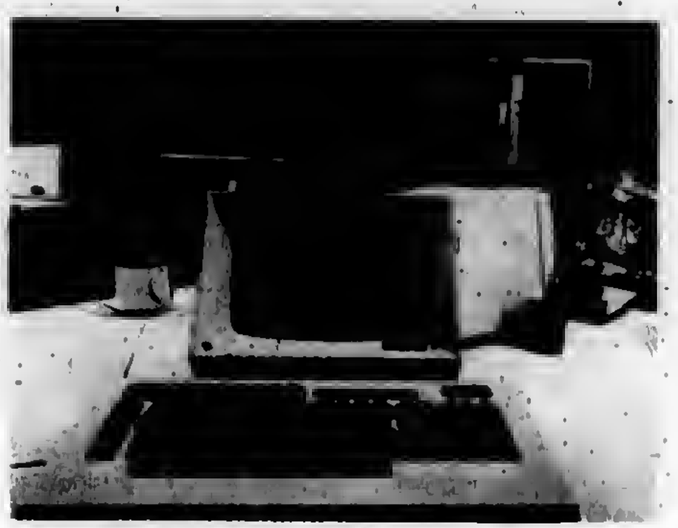

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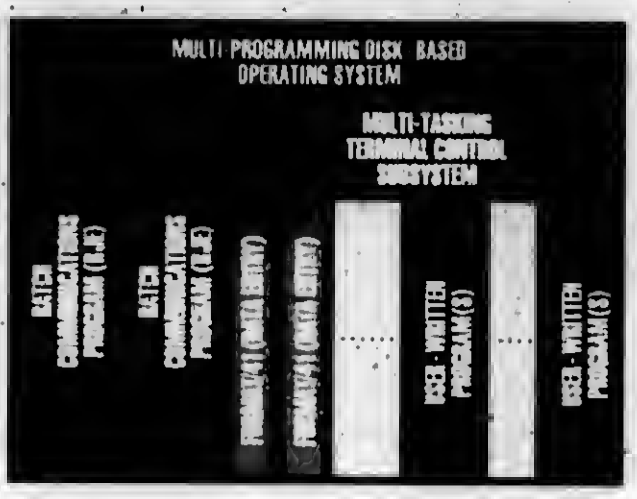
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Cuts Station's Overhead

Micro System Handles Radio Scheduling

By Ann Dooley
CW Staff

ANAHEIM, Calif. — Listeners of radio station KEZY here have a microcomputer-based system to thank for the smooth scheduling of that station's music, commercials and disk jockey chatter.

An AM/FM rock station on the air 24 hours a day, KEZY has used a mini-based automated system for the last seven years to cut down on overhead. It also eases the deejays' workload, leaving them free for promotion and production tasks, according to Mark Moseri, operations manager.

The station moved to a microprocessor-based system two months ago to get more flexibility in switching as well as more reliability, he explained. The new Basic A system is made up of three Intel Corp. 8085 microprocessors and was put together by IGM, a division of Northwestern Technology, Inc.

KEZY uses the system to handle all its switching, music selection and switching decision-making. The system can schedule the sound recordings played over the air for up to 4,000 audio events including songs, commercials and announcements. It also controls up to 16 audio devices such as time and temperature announcers, open-reel tape decks and cartridge tape players.

Little 'Live' Programming

The KEZY audience of 24,000 to 35,000 can listen to musical selections from cartridge tapes, station IDs, time announcements and disk jockeys without actually hearing a live voice for most of the programming period. The system can run for hours without human intervention, Moseri said, adding that the station does go live two or three times each 24-hour day.

The Basic A is programmed sequentially and keys the deejay patter, commercials and music over the air according to a schedule, he said.

The system can display the events coming up next to be broadcast on a color or black-and-white CRT. From a keyboard, the operator can add or change scheduled events or display any event or group of events that is needed. The scheduling is originally done on a weekly basis but programming changes occur almost daily.

The Basic A uses broadcaster's English instead of numbers, which makes things easier, according to Moseri. In order to notify the operator of an available time slot, for example, the system displays "Avail" on the CRT. The CRT can be color-coded for further ease of use, he said.

The Basic A's three 8085s communicate with each other via RS-232 interfaces.

One micro acts as a system controller and the broadcast schedule is stored in this processor's Random-access memory (RAM). The processor keeps track of clock time, sends commands to the other two processors and communicates with the operator.

The second microprocessor, called a monitor controller, lets the operator preview recordings before they are selected or listen to what is currently being played. The third 8085 acts as a device controller for the audio playback equipment.

KEZY originally chose an IGM system because the company was one of the first in the field and was known for its reliability, Moseri said. The Basic A is especially reliable because the system functions are shared among the three processors, an important feature in a real-time controller, he noted. The monitor controller was also designed to act as a back-up system controller if the regular one fails.

Although mishaps still occur from time to time on the air, most of the problems result from disk jockey error or programming error, he said.

The microprocessors run Assembler language programs under RMS-80, Intel's real-time software support system. Since the RMS-80 is modular, Itel supplied only the functions that were needed, so the system is customized, Moseri said. For the Basic A, the RMS-80 modules were used for task switching, real-time clock, serial I/O control and system resource allocation. Eight tasks run under the RMS-80 on the main processor and other tasks run independently on the monitor controller and audio controller.

At this point, the station could not operate under anything but an automated system of this kind, he said. In addition to the cost savings, it makes things easier for the disk jockeys.

Micro Chips

AJA Software Offering Library Of Applications for TRS-80s

ORANGE, Calif. — AJA Software, developers of "ready-to-run" software programs for microcomputer applications, is now offering a library of application programs written specifically for the Radio Shack TRS-80 microcomputer.

Each program comes on diskette, is ready to run and has complete documentation, the firm said. Minimum system configuration includes TRS-80 Basic, one or more floppy disk drives and 8K of memory with an optional printer.

Included in the offering are programs for letter writing, accounts payable and receivable, payroll, general ledger, inventory, sales and sales analysis, a medical/professional billing package and TRS-80 Basic and Disk Basic Tutorial programs.

Each package is guaranteed to be "bug-free" and AJA will correct any problem that develops, it said.

The packages cost $35 each from AJA Software, P.O. Box 2528, Orange, Calif. 92669.

Selectric Conversion System Gains Interface

PLEASANT HILL, Calif. — Escon Products, Inc. has introduced an interface unit for its IBM Selectric typewriter conversion system that can interface to any microcomputer with an S-100 bus, parallel port, RS-232 or IEEE 488 unit.

A microprocessor is included on the circuit board for data flow control, formatting and character set selection. Installation on the Selectric is simple and does not affect normal typewriter operation, the firm said.

The S-100 bus interface costs $496 complete. The parallel port is $525, the RS-232 $549 and the IEEE interface $560 from Escon Products, Inc., Suite 204, 171 Mayhew Way, Pleasant Hill, Calif. 94596.

Artec Adds 10-Slot Version of Motherboard

SAN CARLOS, Calif. — Artec Electronics, Inc. has introduced a 10-slot version of its 16-slot, silent, totally shielded motherboard. Intended for use in compact systems with large memories, the 10-slot configuration allows the processor and peripherals to be condensed into a smaller package, without large amounts of spurious noise in the bus lines, the firm said.

The board features a special Artec technique that terminates each S-100 bus line in an optimum impedance without increasing the zero-state leading of the bus drivers. This eliminates "ringing" but does not decrease capacity, the company said.

The shorter design means users do not waste money or space on unused motherboard capacity, the firm noted. The 10-slot board costs $115 assembled and tested from Artec Electronics, Inc., 605 Old Country Road, San Carlos, Calif. 94070.

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NEC Unit Uses 8080A

WELLESLEY, Mass. — A single-board computer that uses the industry-standard 8080A microprocessor has been introduced by NEC Microcomputers, Inc.

The TK-80A combines NEC's own UPD8080AF MPU with 1K byte of random-access memory (RAM) and 1K byte of electrically erasable programmable read-only memory (EEprom). It can be expanded to 4K by 8K bytes of RAM and 8K by 8K EEprom, according to a spokesman.

The unit includes a Kansas City-type 300-or 1,200 bit/-sec. cassette interface and three 8-bit programmable I/O ports. The TK-80A costs $299 from NEC Microcomputers at 173 Worcester St., Wellesley, Mass. 02181.

Intel Adds 16-Bit Single Board

SANTA CLARA, Calif. — Intel Corp. has introduced the latest Multibus-compatible member of its single-board computer line, the ISBC 86/12.

Based on the 16-bit 8086 microprocessor, the board supports a 1M-byte address space. It enables, for the first time, both 8- and 16-bit single-board computers to be interfaced over the same bus in multiprocessing configurations as well as with other peripherals, the firm claimed.

In this way, a designer can create a low-cost design using an 8-bit single-board computer and enhance it over time, a spokesman noted.

The ISBC 86/12 is supported by the Intellec Series II development system and software that supports high-level language development, he added.

Interfacing Software

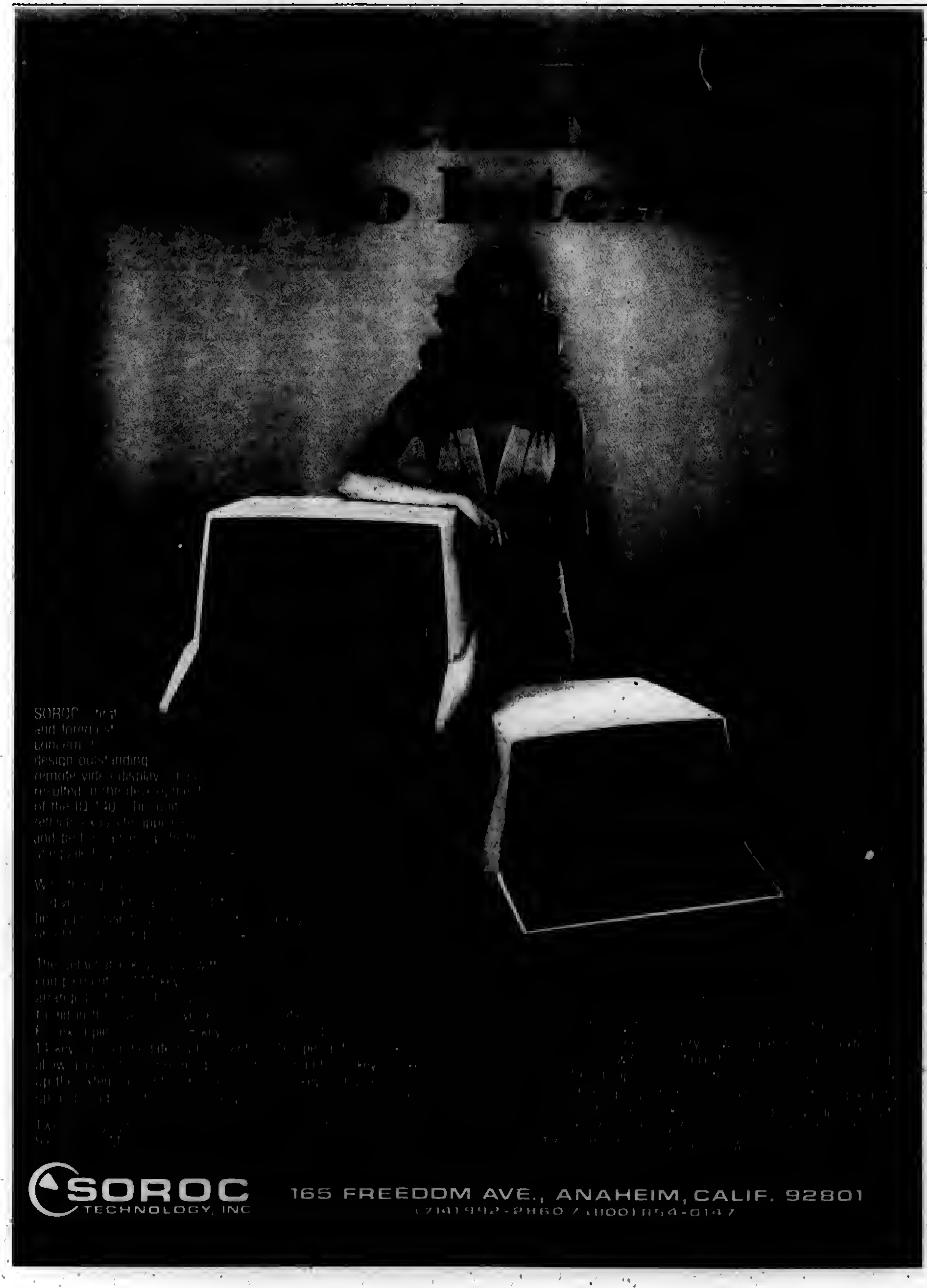
In addition to the 86/12, Intel has introduced the ISBC 957 interface and execution package that reportedly permits software modules developed on an Intellec development system to be downloaded into the 86/12 for full-speed execution and debug.

This enables the designer to begin system development immediately with the 86/12 using the same software as for the ISBC 80 products, the firm said.

To facilitate program development, the interface and execution package provides all the hardware, software cables and documentation required to interface the Intellec system to the 86/12 board.

The ISBC 86/12 includes the 16-bit HMOS 8086 microprocessor; 32K bytes of dual-port dynamic read/write memory with on-board refresh and sockets for up to 16K of read-only memory (ROM); interfaces for both serial and parallel I/O; and a full RS-232C interface. It provides nine levels of vectored priority interrupts expandable to 65 levels over the Multibus system.

The ISBC 86/12 costs $2,140 and the ISBC 957 package costs $2,145 from Intel Corp., 3065 Bowers Ave., Santa Clara, Calif. 95051.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'Taxpro' Works On IRS Forms

ROWLAND HEIGHTS, Calif. — Dicomp Business Programming is offering software for the professional tax preparer who has an 8080 microcomputer, North Star Computers, Inc. disk drive and printer.

The Taxpro package processes Internal Revenue Service (IRS) 1040 forms and 13 related schedules with the "least tax" approach, according to the firm. It prints in format on 1040 forms and prints other forms on plain paper.

A similar package for the home user is Taxpac, which processes IRS 1040 and up to five related schedules and forms. The display is on a CRT screen with dollar amounts listed in order by form number.

Taxpro costs $1,415 and Taxpac costs $39.95 from Dicomp Business Programming, P.O. Box 8272, Rowland Heights, Calif. 91748.

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With Stock Market Jumpy

Some Firms Postpone Stock Offerings

By Marcia Blumenthal
CW Staff

A jittery stock market and the uncertain economic outlook for the next year have resulted in some postponements of public equity offerings by companies whose offerings would have been effective by the end of the year.

While some firms have squelched their plans for public issues, others are forging ahead with the sale of their stock and still others are undecided, waiting for a bright sign in the market by year's end.

Display Data Corp. decided two weeks ago to postpone its public offering, which would have been its debut in the stock market. "We could go public tomorrow and sell out, but the issue is what price you get for that stock," Robert F. Barron, vice-president of finance, remarked.

The company's underwriters and management will determine when the time is right for the sale of the stock, Barron said.

According to the company's prospectus, the offering of one million shares had a tentative price of $14 per share. The five-year-old firm, which specializes in turnkey systems, had sales of $18.3 million for fiscal 1978 ended August 31. Earnings were $1.6 million.

Ramtek Going Ahead

In contrast, Ramtek Corp., which does not yet have a public market for its stock, is planning to go ahead with its first offering. In recent weeks, however, the company's management has been holding meetings with its underwriters to assess the exact timing for the issue.

The situation boils down to how much of a penalty Ramtek is going to have to swallow in a skittish market. "If we are going to be penalized 15% because the market is down, then that's probably tolerable. If we are going to get a bigger penalty in pricing our stock, then we will 'withhold,'" Ramtek's president and chairman of the board, Charles E. McEwan, noted.

Ramtek's prospectus anticipated the price of the stock would be between $10 and $12, but "we won't establish a final price until the night of the offering," McEwan said.

As far as McEwan was concerned when interviewed, his company is going ahead with the sale of the issue. "Our financial figures are based on a year-end audit in June; if we go beyond a six-month period for a full audit, our underwriters will probably require a

(Continued on Page 94)

Struggle With Debt Level Spurs Calcomp to Adopt Sales Accent

By Marcia Blumenthal
CW Staff

ANAHEIM, Calif. — An "overwhelming need" to ease an unmanageable debt level has caused management at California Computer Products, Inc. to shift the company's emphasis from manufacturing to sales and distribution.

To reduce its debt and minimize spending on manufacturing and research and development, Calcomp recently sold off its Memory Products Division to Xerox Corp. and established a separate minicomputer peripherals marketing department.

In addition, a revenue-sharing arrangement recently negotiated with Insac Data Systems Ltd. of London is under way. The two companies will share investment costs as well as the revenue gained from developing 15 application packages for Calcomp's IGS-500 interactive graphics system.

"The sale of the Memory Products Division raised enough cash to reduce debt," George Canova, Calcomp's president, explained. "In the new peripherals marketplace we can offer products manufactured by others without the R&D expense needed to develop those products or the working capital requirements for buying inventories or financing receivables."

Calcomp sold its Memory Products Division to Xerox for $25 million in cash. The lion's share of the proceeds from the sale will be used to retire debt, which recently stood at more than $42 million. The debt repayment will reportedly save Calcomp about $2.5 million in annual interest expenses.

"Stalled" was the word Canova used to describe the financial picture at Calcomp for the past four or five years. "We were profitable in 1978 and 1977, but for the three years previous to 1977 we incurred losses," Canova said.

He attributed those losses to R&D expenses and high debt costs. The journey into debt began in the early 1970s, when Calcomp began to diversify its profitable plotter and interactive graphics line, branching out into manufacturing IBM plug-

(Continued on Page 96)

For Third Quarter

DP Trade Balance Favorable

WASHINGTON, D.C. — Imports of computer and business equipment totaled $568 million in the third quarter of 1978, a 43% increase over the third quarter of 1977, according to statistics compiled by the Computer and Business Equipment Manufacturers Association (Cbema). Exports were $1.3 billion, up 29.1% over the year-ago quarter.

Those figures provide a favorable balance of trade for the industry of $749 million, a 20.2% increase over the 1977 quarter.

The first nine months of 1978 showed a positive balance of trade of $1.99 billion for the industry for an increase of 16% over the $1.71 billion reported for the first nine months of 1977.

Exports rose 26% during the three-quarter period, from $2.78 billion in 1977 to $3.62 billion in 1978. Imports, however, experienced an increase of 40% from the $1.16 billion reported in 1977 to $1.63 billion in this year's nine months.

Computers and related equipment account for more than 80% of the industry's current year-to-date export total, according to Cbema. Exports of that equipment for the first nine months had $1.9 billion value compared with $1.7 billion a year ago.

The level of exports for parts for computers and peripherals in the 1977 period was $658 million and rose to $1.1 billion in the first three quarters of this year. Imports rose 41% from $184.2 million during the first nine months of 1977 to $261 million for the same period in 1978.

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Fourfold Leap Predicted in CRT Graphics Mart

WELLESLEY, Mass. — Growing use of raster scan technology and emerging applications areas will set the pace for a four-fold leap to more than $1 billion in the CRT graphics market by 1983.

The $275 million interactive graphics market will skyrocket in the next five years as it gains a strong foothold in business applications, according to a Venture Development Corp. (VDC) market study.

Management information will be the single largest application for graphics in the early 1980s, when the business graphics market will hit $243 million — equivalent to the shipping of 111,000 terminals, the study predicted.

By that time, computer graphics will be available not only in virtually every engineering laboratory, but will also be used routinely for generating management reports, VDC said.

Raster Scan Market

Spurring the growth in CRT graphics is raster scan — or digital television — display technology, which will experience a surge of its own during the five-year period, according to VDC.

The raster scan display market will grow 60% per year, the study forecast, outpacing both random scanners (vector or strobe) and storage tubes as the most popular graphics display technology.

Currently holding 31% of the graphics market, raster scanners will capture the lion's share — 74% — by 1983. Random scan technology will climb 18% yearly, but its share of the market will decline from 30% to 16% by 1983, the study said.

Storage tube technology, originally developed by Tektronix, Inc., for storage oscilloscopes, will bite the dust as the leading graphics display technology, increasing a meager 1% annually in dollars into the 1980s, VDC indicated.

While its market share will dtop from 39% to 10%, direct view storage tubes will continue to be the most widely used technology in computer-aided design/computer-aided manufacturing (CAD/CAM) turnkey systems because of superior resolution.

Tektronix, however, is not counting on the storage tube alone to secure its hold as leading graphics terminal supplier, VDC noted. The vendor recently came out with both monochromatic and color raster scan-type graphics displays.

Raster Scan Benefits

Sales of raster scan terminals are taking off because they surpass both storage and vector technology in the ability to process photographic images such as those obtained from earth satellites and X-ray scans, VDC said. In addition, the raster scanner can selectively erase parts of a picture and display a wide range of color shades and intensities.

While competing display technologies provide better picture resolution, VDC noted raster scanners cost less at lower resolutions.

In fact, the prices of CRT graphics terminals will steadily decline as the cost of memories and semiconductor packages continues to plummet, the study predicted. Because interactive graphics terminals are cheaper to use, VDC said they already are displacing alphanumeric terminals in many applications.

Another advantage of CRT graphics terminals is that they do not require skilled labor to operate, VDC pointed out.

One indication of increased expectations for CRT graphics is the rapid growth of many companies in the industry. For example, VDC said, Computervision - the industry leader in turnkey CAD/CAM graphics systems — has been able to triple its stock price in the last nine months.

Although interactive computer graphics promises to be a hot business in the next few years, it will become harder to compete because of rapid technology changes and volatile prices. A number of CRT graphics equipment manufacturers that were active in the early '70s — including Photon, Data Disc and Computek — have since dropped out, the report said.

Suppliers to this industry will have to keep up with persistent advances in terminal speeds, resolution and intelligence, in order to stay in the running, VDC warned.

"The CRT Graphics Terminals and Systems Markets" report costs $1,375 from 1 Washington St., Wellesley, Mass. 02181.

Supershorts

Xitan, Inc. has consolidated all East Coast manufacturing, microcomputer hardware and software engineering and service operations into a 40,000 sq-ft facility in Hanson, Mass., to provide more production space for handling a backlog of more than $18 million.

— — —

Tratec, Inc. has increased its regular semiannual cash dividend by 20% to 4 cents a share.

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National Systems Analysts, Inc., a DP consulting firm, has acquired Quad Data Associates, Inc. Quad Data will operate as a subsidiary of National System Analysts and will provide programming services, turnkey systems and a municipal accounting package.

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Jilted by George, CSD Rallies With Own System

CINCINNATI — Computer Systems Development, Inc. (CSD) is expanding its corporate headquarters here and gearing up its manufacturing capability to produce its new small business system.

CSD was formed earlier this year in anticipation of buying Cincinnati Milacron, Inc.'s (CM) George line of small business systems. In July, CM refused to extend the time limit for the consummation of the sale to CSD [CW, July 17].

That refusal left a wake of disappointed distributors, at least one of which is suing CM, as well as a company without a product, according to CSD President Wayne Sennett, former manager of CM's Computer Division.

Now, however, Sennett's company has rallied and has introduced a microprocessor-based small business system for stand-alone or distributed processing use (see story on Page 73). Sennet claimed CSD's small business system is the first to incorporate Intel Corp.'s 8086 microprocessor design and is expected to compete directly with IBM's Series/1.

The processor will cost about half as much as the Series/1, according to Sennet. CSD's small business system line will be priced in the $10,000 to $35,000 range and will target the low-end system user.

Distributor Network

Although CSD's two-person marketing staff is still in its fledgling stage, Sennett anticipates selling CSD products through a distributor network similar to that used by CM. "After all, I was the author of Milacron's distributor network," he explained.

However, Sennett expects CSD will foster a closer relationship with its distributors than did CM. The company is looking into the possibility of forming limited partnerships with some companies signed on as distributors.

Sennett doubts that CSD will be able to pick up CM's distributor base because many of CM's distributors have taken on other small business lines.

Initially CSD will offer the standard business applications software for its systems, Sennett noted, but will introduce a construction package in January and one for certified public accountants in February.

Right now, CSD is gearing up to produce the small business system. According to Sennett, the beefing up of the manufacturing capability is being spurred by "interest in an intelligent interface control for rotating Winchester-type storage devices that are now in limited production."

Micro Growth Hinges on Chips: Pactel Report

LONDON — Despite advances in chip technology, the growth of microcomputers in Western Europe will ultimately hinge on how, when and if industrial designers use this technology.

Technological improvements and offerings of 16K-, 32K- and 64K-bit random-access memories (RAM) will not be enough to set the micro market off on its potential 31.9% growth cycle through 1986, according to a market report by PA Computers and Telecommunications Ltd. (Pactel).

Whether this $105 million market reaches a projected $832 million in eight years will depend largely on how successfully the micro can wend its way into new application areas, the report noted.

Currently, computers and terminals account for 61.5% of the European micro market, but Pactel predicted this percentage would drop nearly 50% by 1986, when telecommunications and the automotive industry become more committed to the technology.

Competitive Picture for Micros

The competitive picture in the microcomputer business appears to mirror that of other computer markets, Pactel noted. What IBM is to mainframes and Digital Equipment Corp. is to minis, Intel Corp. is to micros, with 52% of the European market and little erosion likely.

Competitors will decrease in number, Pactel forecast, because of inevitable acquisitions and mergers. To survive, suppliers as well as users will have to respond quickly to technology and market shifts.

Titled "The Microcomputer Marketplace in Western Europe, 1978-1986," the report costs $995 from Pactel, 33 Greycoat St., London SW1 P2QF, England.

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Philippine Islands Seen A Logical Site For Setting Up Central Pacific DP Capital

ANAHEIM, Calif. — The Philippine Islands are a logical site for the Central Pacific's computer capital, and the establishment of a strong computer industry there may be a reality by the mid-1980s, an industry executive predicted on his recent return from Manila.

The combination of low-cost labor and a highly educated populace makes Manila the logical place for establishing both manufacturing plants and sales offices, William Terry, vice-president of marketing for the Data Products Division of Lear Siegler, Inc., reasoned. "Even though the nation has been independent for 20 years, the basic psychology of the country is oriented to the U.S.," he asserted.

There are more college graduates per 1,000 people in the Philippines than in any other country outside the U.S., Terry noted, pointing out that an educated work force is in place. Morever, the pay scales are very reasonable.

"An industry chief executive who would command $75,000 in the U.S. would be paid $40,000 in Manila. A technical person paid $25,000 in Southern California would probably earn $8,000 in the islands," he said.

In addition, Philippine businesspeople usually speak fluent English. Terry concluded that the education level, pay scales and English fluency in the Philippines gave that nation "substantial advantages" over Hong Kong, Japan and Singapore.

There are 250 to 300 DP systems in operation in the Philippines today, Terry claimed, adding that the trend there is toward turnkey systems development.

Future Plans

Terry envisions a range of software exporting firms establishing bases in the Philippines by the end of the decade and a core of American manufacturers producing hardware there by the early 1980s.

The Philippine government is currently researching the capability to develop computer systems among the islands that comprise the nation.

Lear Siegler set up a distributorship in the Philippines last August and is exploring other business arrangements there, Terry said. The company exhibited its products at the recent Regional Computer Conference sponsored by the Association of Southeast Asia Nations.

"However, the kind of sales sophistication that we have in the U.S. doesn't exist in the Philippines or anywhere in Southeast Asia; for that matter," Terry observed. One solution to that problem, he suggested, was bringing Philippine college graduates to the U.S. for six months of specialized training.

Executive Corner

- Dennis M. Mannion has been named vice-president of operations at Documation, Inc.
- Alex Bernstein has joined the Brandon Consulting Group as a senior consultant.
- David C. Pixley has been named by the board of directors of Genesse Computer Center, Inc. as president and chief executive officer, and Kurt Enslein has been named senior vice-president and chief scientist.
- Robert B. Hawkins has been named executive vice-president of Control Data Corp.'s Computer Group. He will be in charge of managing the company's activities in international ventures and cooperative programs involving technology exchange.
- Paul J. Mozola has been named vice-president of the Midwestern region of Data Processing Security, Inc.
- Byrne O'Brien has been named director of administration and finance and Michael Nugent has been named staff attorney at the Association of Data Processing Service Organizations.
- Jack Robinson has been appointed regional marketing director for the Midwest and West Coast operations of Data Access Systems, Inc.
- Thomas Frenier has joined Dearborn Computer Co. as controller. Jack Hughes has joined as its manager for the Western region and Robert Meyer has joined as manager for the Northeast region. Another new employee, Robert Neumeyer, has been appointed product manager, and William Eick is the firm's new regional manager of software sales.
- Leland C. Fay Jr. has been named president of Evidex Corp., a Chicago-headquartered litigation support service company.
- John J. McElroy has been appointed president of Interactive Data Corp.
- R.E. (Bob) McKeon has joined ITT Courier Terminal Systems, Inc. as vice-president of field engineering.
- Daniel Toth has been named vice-president for communications industry marketing for the Infonet Division of Computer Sciences Corp.
- A.C. Rice has been elected to the board of directors of Tandem Computers, Inc.
- Juan A. Rodriguez has been appointed vice-president and general manager of Storage Technology Corp.'s Disk Division.
- Joseph J. Kroger has been named president of Univac's Marketing and Services Division and Paul J. Spillane has been named president of the firm's Products Division.

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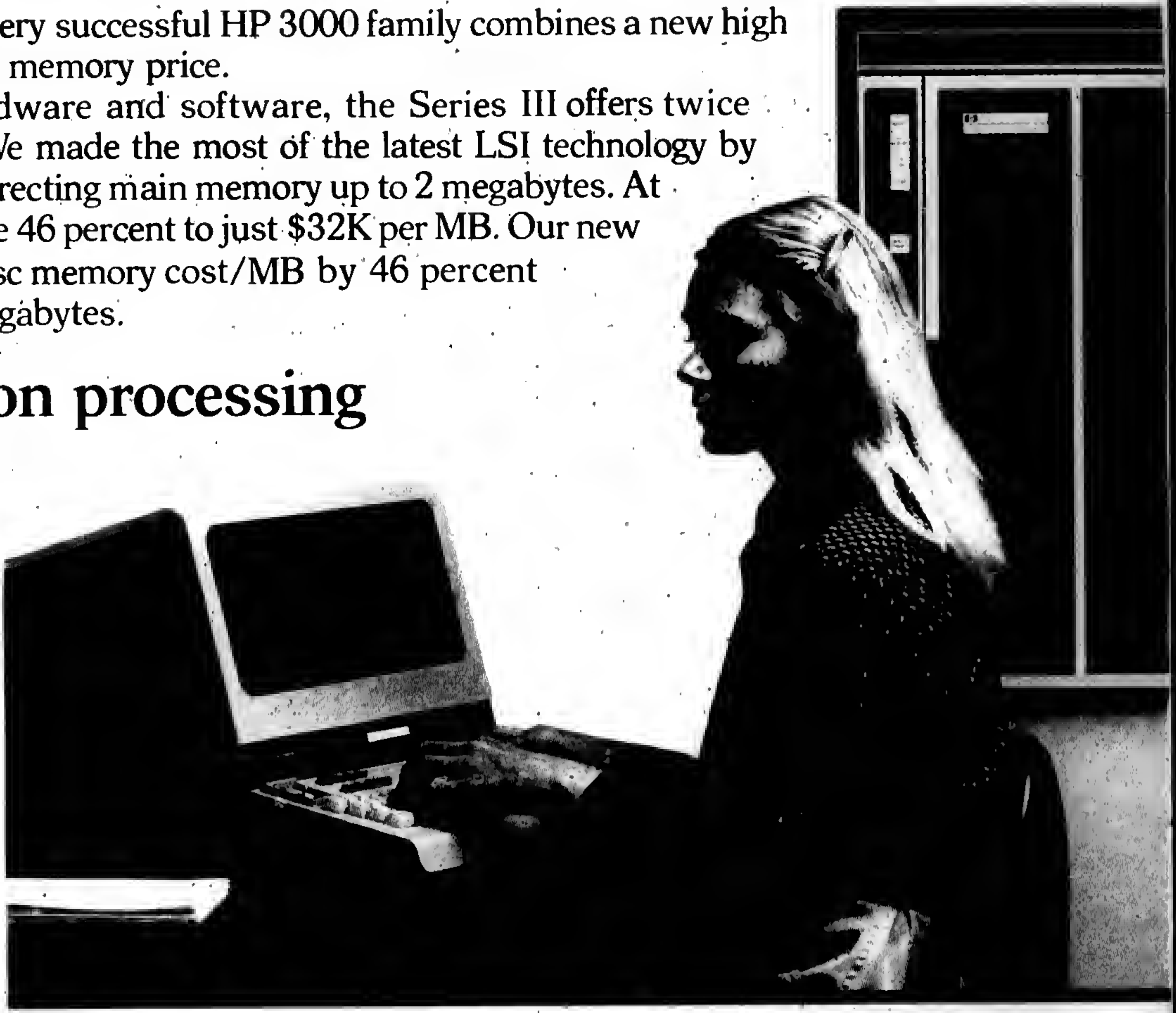

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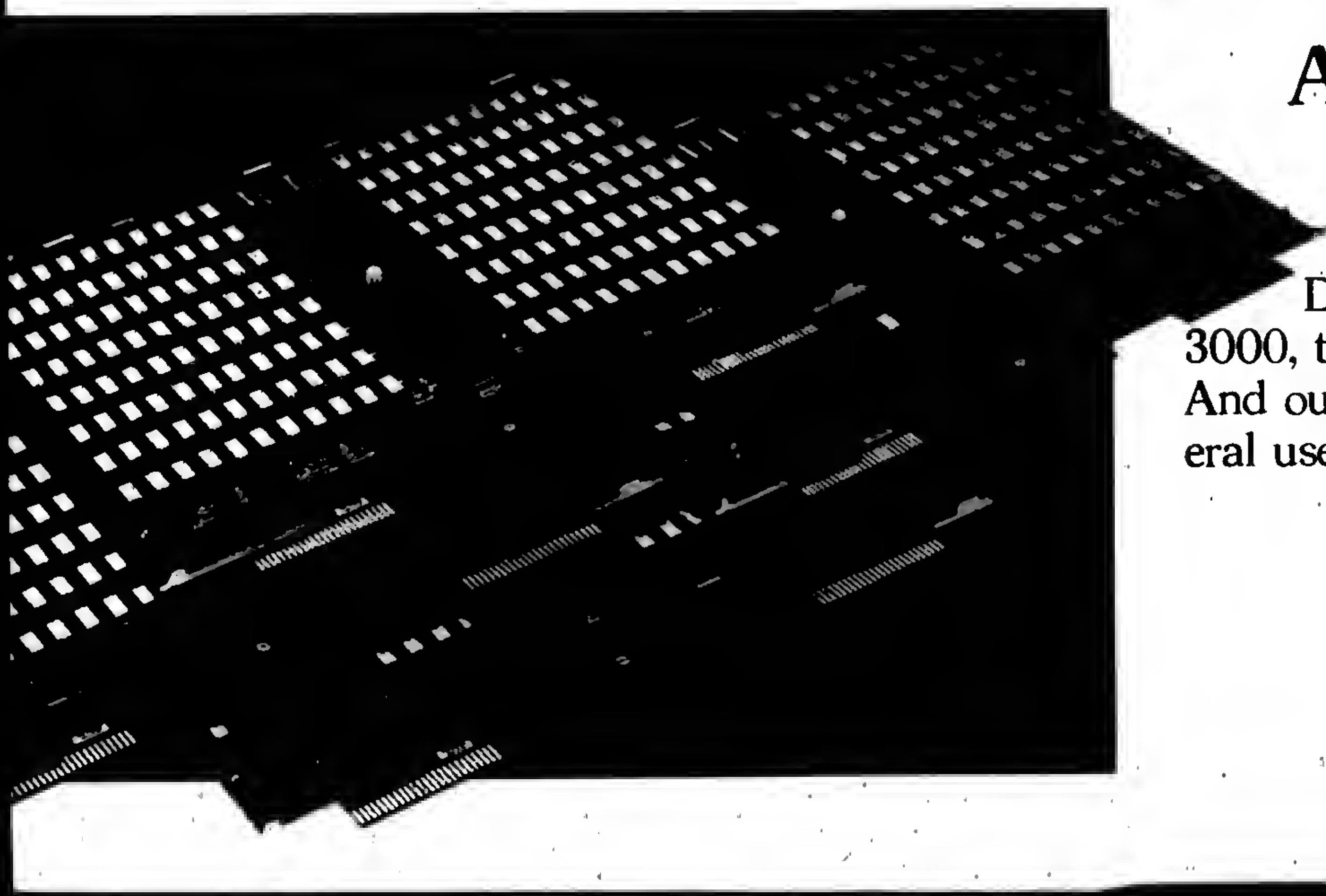

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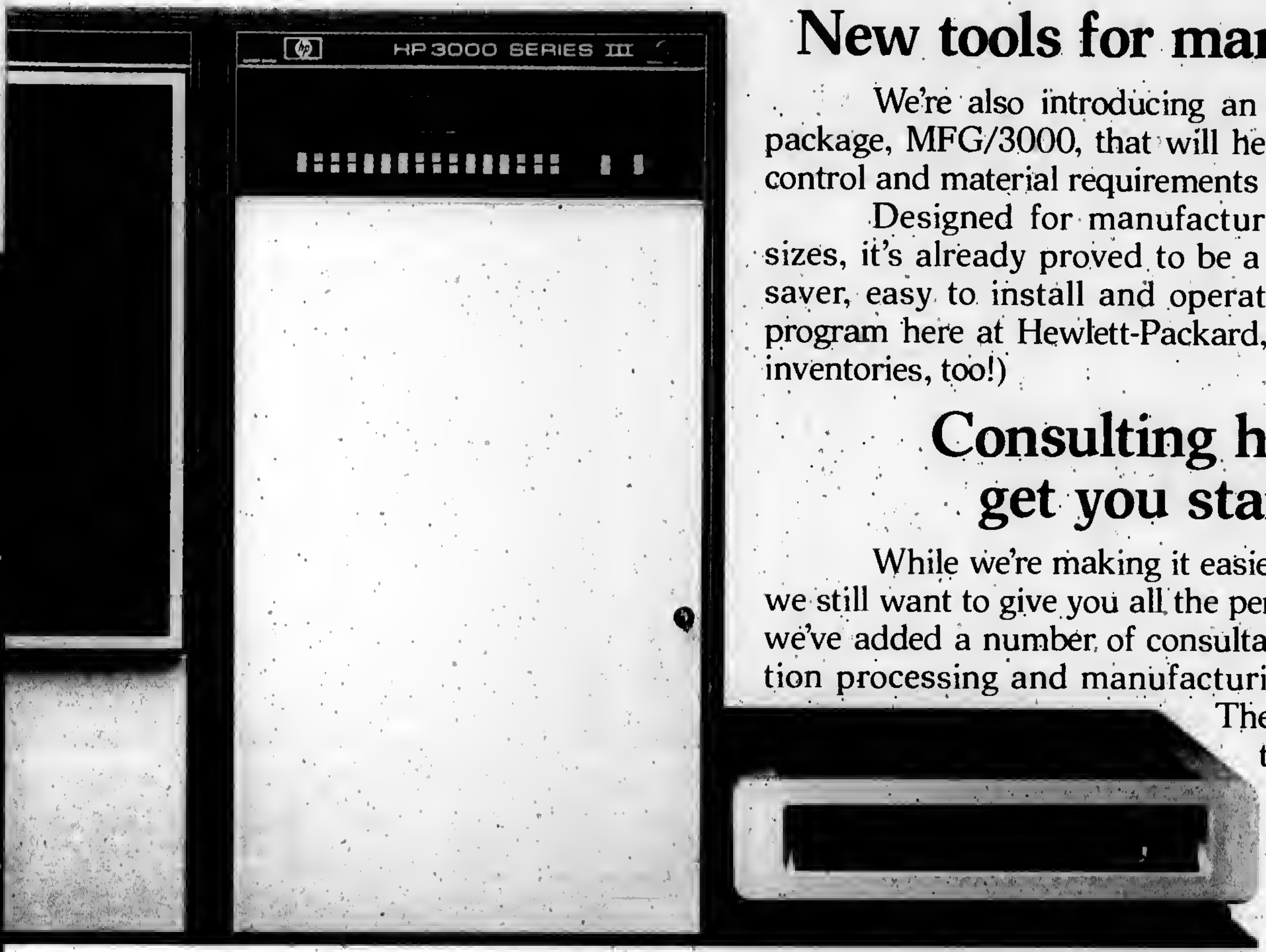

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Stock Offering Reactions Mixed in Jittery Mart

(Continued from Page 87)

reaudit," he pointed out.

Besides the problem of a reaudit, McEwan said, "we've been growing at about 35% to 40% per year. Retained earnings cannot sustain that growth rate. Our choice if we don't go public is to reduce our growth curve." He was not particularly happy about the prospect of reduced growth.

Modular Computer Systems, Inc., an established firm on the stock market, has withdrawn its stock offering, thereby limiting its opportunity for growth. The stock was trading at $15 a share earlier this year and is now priced at about $9.

Modcomp withdrew its offering for two reasons, according to Kenneth G. Harple, its president. "The main reason we withdrew was that the market was down and, since it was so close to the end of the year, our underwriters would have insisted upon reaudited financials," he said.

"Also, we had a large loss in 1976, but when we filed, the Securities and Exchange Commission questioned whether the loss was really incurred in that year. We are now doing an analysis, which is complicated because the records are so old."

The company's bank line will be adequate financing for the next one or two years, Harple added. However, bank financing will require running the company much more conservatively, he indicated.

With equity funding, Harple said, Modcomp could have looked for growth through acquisition, an option which the company will not now consider.

"We don't anticipate any serious cutbacks in our operation, but if we had the opportunity to double now, we wouldn't double, we would control our growth," Harple maintained.

Two Firms Undecided

Still looking for a clearing of the stock market clouds are Computervision Corp. and Data Dimensions, Inc. Data Dimensions' filing will be effective the week of Dec. 18.

"If the market is good and the stock is at a reasonable price, we will go ahead," Lester Gottlieb, president, said. On the day he was interviewed, Gottlieb said, "today I wouldn't do the deal."

Data Dimensions has not raised equity capital since its initial offering in 1969. The company's stock was recently trading at $5.50 per share, down from $8.75 when the firm filed with the Securities and Exchange Commission in August.

Data Dimensions' underwriting agreement states the firm does not have to go forward with the offering if the stock price is less than $7 per share. Should the company decide to withdraw its offering, it will not proceed with another offering until late spring, Gottlieb said.

The firm would use equity capital to reduce debt and for lease financing, he added.

Martin Allen, president of Computervision, isn't particularly concerned about whether there will be a market for the company's stock. The price is what bothers him.

"The stock is considerably underpriced based on any reasonable measure," he said. In August Computervision was trading at $25 a share. It later slipped to $18 and has since recovered to about $22.

While not proceeding with the public issue would require more careful asset management, the company is going forward with its expansion plans regardless of whether the stock offering is made, Allen said. Part of that growth plan includes the addition of about 350,000 square feet of space to various divisions.

MCI Going Forward

MCI Communications Corp. intends to go forward with its sale of stock. "The market is stabilizing from its rundown in October and November," V. Orville Wright, MCI president, said. The company's stock was trading at $5.75 in late September and was recently priced at $4.

The capital raised from the offering will be used for debt payments and for working capital for "market opportunities provided by two recent court decisions on Execunet," Wright said.

Regardless of the mixed bag of responses from companies planning public offerings, Roy Rogers of Hembrecht & Quist said the prices on the market have adjusted downward by about 20% to 30%.

As a whole, the market now is priced at an average of nine to 10 times projected earnings; earlier in the year, prices were based on 12 to 13 times projected earnings, Rogers noted.

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John Bock
Vice President, Systems Development, Itel Corp. Data Products Group
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Victor D. Poor
Senior Vice President, Research and Development, Datapoint Corporation
"Distributed Systems Architecture and Processors." Distributed functions, control, processing, databases: what are the present and future economic trade-offs?

Dr. J. Egil Juliussen
Senior Member, Technical Staff, Texas Instruments Corporation Engineering Staff
"Semi-Conductor Technology: Driving Force for Computer Systems." Can current computer architecture/designs effectively utilize 64K storage chips, bubbles, CCDs, fiber optic cables, etc.?

Dr. Eugene I. Lowenthal
Vice President, Advanced Product Planning, MRI Systems Corporation
"Database-Centered Architecture and Processors." The back-end file processor's impact on the user and vendor; strengths/weaknesses of the database-processor approach.

Asa W. Lanum
Director, Product Software Development, Amdahl Corporation
"User Opportunities to Improve Software Investment Pay-Off." Can new software be combined with old to produce more effective end-user operation? How does hardware enhance or stifle the potential?

C. Oakley Mertz,
Vice President, Research, International Data Corporation
"The User Customer Base and Systems Migration Dynamics; Impact of Distributed Processing." IDC's migration study—how fast are users moving to newer systems, networks (SNA/SDLC) and distributed processing? What is the likely impact on computer usage in the 1980's?

James E. Thornton
President, Network Systems Corporation
"New Alternatives in Systems Architecture." Will conversion/migration between non-compatible systems be easier by 1982/83? More or less costly? And what innovative architecture choices are open to users now?

James McGuire
President, Computer Division, National CSS
"Computer Services, User Hardware Hybrid Systems." Why are the service companies now supplying their own hardware? What's next?

Dr. James W. Jewett
Vanderbilt University, and President, Telco Research Group
"Communications Systems—Optimizing 1980 Alternatives." How can users select from new carrier offerings in the packet and satellite areas? What compromises and trade-offs are needed with existing communication network investment?

Additional speakers to be announced.

Richard L. Nolan,
Chairman, Nolan, Norton & Company
"Planning to Manage the New Systems Technology in the 1980's." Managing and adapting to fast-paced changes in technology and marketplaces; cost-benefits analysis and cost control.

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Energy Efficiency Up

WASHINGTON, D.C. — The computer and business equipment industry attained a 33.4% improvement in energy efficiency since 1972.

This figure and other statistics were part of a required report recently made to the U.S. Department of Energy by the Computer and Business Equipment Manufacturers Association (Cbema).

Since the 1972 base reporting year, space devoted to manufacturing has increased 17.5%, Cbema noted. However, total energy consumption in British Thermal Units (BTU) has decreased across the industry by 19.2%.

If energy conservation measures had not been taken by companies in the industry, total BTU consumption would have reached 22.4 trillion BTUs for the six-month reporting period. Instead, a decrease to 14.95 trillion BTUs occurred in the first half of 1978, the report indicated. Production space for 1978 was 107.4 million sq ft.

During 1972, BTU consumption was 18.5 trillion per half-year for 88.6 million sq ft of space.

A distribution analysis of the various energy sources indicated that although there was a light increase in the use of gasoline, the major energy source for the industry continues to be electricity. Electricity accounted for 48.8% of all energy consumption, natural gas for 32.54% and fuel oil for 17.47%.

CI Notes

Radio Shack Opening Modularized Stores

FORT WORTH, Texas — By the end of this week Radio Shack will have opened three modular concept stores which will feature separate department layouts for the company's three newest product lines in addition to standard Radio Shack products.

A computer department will be included in these "Super Shacks," as one spokesman dubbed the store concept.

"The modular area in the three new retail locations is not the same as the design or purpose of the Radio Shack Computer Centers we are opening in major markets," Radio Shack President Lewis Kornfeld said.

The modular concept stores will not carry the complete line of computer products offered by the centers, but will rather stock the more popular products. Some customers already know what computer products they want to purchase and do not require the full depth of expertise the Computer Center Stores offer.

While the company is not sure of the modular stores' final effect, the concept was designed to attract business, the spokesman said. The three stores will be located in New York, Washington, D.C. and Chicago.

Meanwhile, the company is also gearing up to establish 50 Radio Shack Computer Centers by the end of May, the spokesman said. To date seven centers are in operation.

Exhibit Bookings Set Record For Interface '79 in Chicago

CHICAGO — With more than four months left until the show, the Seventh Annual Interface Data Communications Conference and Exposition has already booked a record amount of exhibit space.

The sponsoring Interface Group reported that 172 companies have booked nearly 80% of the 834 available booths for the show, which will be held April 9-12 here at McCormick Place.

A total of 220 suppliers of computer/data communications hardware, software and services is projected to exhibit at the show, which would represent a 25% increase in the number of companies and 50% increase in the amount of space compared to Interface '78.

Attendance is expected to be a record 15,000, compared with 8,000 at Interface '78, according to Sheldon G. Adelson, president of the Interface Group.

Adelson attributed the growth of the conference to the increased computer and communications market and to Chicago's importance as a regional computer base. He said 25% of nonsalary DP budgets now go for data communications hardware, software, distributed data processing, networking, line charges and other communications costs.

The national Interface show is now the largest data communications conference in the world and second largest computer-related show in the U.S., Adelson claimed.

Interface '79 will be the only major computer conference in the Midwest next year, Adelson said. Other Interface Group conferences during 1979 will be the Federal DP Expo, March 9-21 in Washington, D.C., and Interface West, Oct. 30-Nov. 1 in Anaheim, Calif.

Electronic Arrays to Merge With NEC's U.S. Subsidiary

MOUNTAIN VIEW, Calif. — The shareholders of Electronic Arrays, Inc. have approved the merger of the company with the U.S. subsidiary of Nippon Electric Co. Ltd. (NEC).

The shareholders will receive $5 in cash per share in exchange for their Electronic Arrays common stock.

Electronic Arrays manufactures and markets MOS large-scale integrated semiconductor circuits.

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Struggling With Debt, Calcomp Stresses Sales

(Continued from Page 87)

compatible tape and disk memories.

"The rapid price changes and the kinds of competitive actions for which we sued IBM have affected our ability to compete in the plug-compatible marketplace," Canova lamented. Although Calcomp has now completely ceased manufacturing IBM plug-compatible equipment, it will continue to purchase that equipment from other vendors and sell it to both its existing customers and new sales prospects.

However, Calcomp will continue to manufacture its "bread and butter" plotter and interactive graphics products, Canova said.

The markets Calcomp is exploring, such as minicomputer peripherals and software packages, are being chosen "dependent on the amount of capital needed to exploit those markets and our company's strengths," he continued.

Canova described the minicomputer peripherals venture as essentially a distributorship. "We already are end user-oriented and have a large sales and field service organization throughout the country."

The difference is that now Calcomp will purchase a wide range of peripheral products from other manufacturers, put the Calcomp label on the equipment and offer local service. The new sales group is separate from the existing sales force and will not sell IBM plug-compatible peripherals.

Currently the minicomputer peripherals marketing department is touting a line of printing systems for use with Digital Equipment Corp.'s PDP-11 and Data General Corp's Nova and Eclipse computers as well as three disk storage subsystems for use with DEC's PDP-11.

The first in a group of products called the "Supermini Series," Calcomp is already selling these products in three major metropolitan areas.

Prices for the printing systems range from $10,200 to $29,800. The disk subsystems are priced between $20,800 and $33,900. In both cases installation is included in the purchase price. By 1979, Calcomp said it will introduce a magnetic tape system, add-in and add-on memory and terminals.

While these products do not offer appreciable savings over DEC or DG products, Canova noted that, in many cases, they offer higher performance and give users the "security blanket" of local service backing.

Excited About Venture

Canova is excited about the revenue-sharing venture with Insac. "We just shipped an interactive system to Insac so it can develop application programs," he said.

Supplying the equipment is Calcomp's investment in the software development project, he explained.

The venture calls for Insac to develop 15 application programs for Calcomp's IGS-500 system. The contract is likely to involve a team of about 20 people working in the UK for several years, an Insac spokesman said.

The first products, an isometric engineering drawing system and a utility mapping system, are scheduled for introduction in early 1979.

As Calcomp sells its graphics systems and the Insac software, the two companies will begin to share the revenues from those sales. "The revenues will not necessarily be split 50-50," Canova added.

With the realignment of its product line, Canova predicted Calcomp's revenues and earnings will grow "at least as fast as the computer industry — about 15% to 20% a year."

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United States	36,100	45.3%	1
Japan	8,331	10.0	2
W. Germany	6,527	7.9	3
United Kingdom	4,794	5.8	4
France	4,768	5.8	5
Canada	2,301	2.8	7
Italy	2,119	2.6	8
Australasia	2,044	2.5	9
Brazil	532	.8	17
Middle East	328	.4	22

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By Western Standards

Soviet DP Industry Still Lagging After 25 Years

By Irwin Ross
Special to CW

Although the Soviet DP industry marks its 25th anniversary this year, by Western standards it is still an upstart without the financial or technological resources to create a computerized society.

The best Soviet-made computers are believed to lag at least three years behind American systems in processing ability, eight years in memory capacity and a decade in peripheral apparatus.

Soviet software is said to be about a decade behind American capabilities.

Western experts estimate there are at least 80 computer-producing plants in the Soviet Union, with more than a half million workers assigned to the manufacture or use of computer equipment.

However, there are only about 25,000 computers in Russia, one-third of which are being used for nonmilitary purposes. By contrast, the U.S. has more than 300,000 computers, with three-quarters of them in commercial operations.

While the average American does business with a computer about 10 times a day, the average Soviet can go for months or even years without interacting with one.

There are no credit cards or charge accounts in department stores in Russia, no automated deposit and withdrawal systems at banks and no computerized reservation systems in hotels or on the domestic flights of Aeroflot airlines.

The situation would appear to be a promising one for American computer manufacturers, a handful of which maintain offices in Russia. But to date the Soviets have been bearish buyers, purchasing only a limited number of extremely complex systems and showing little interest in workaday machines that handle such pedestrian chores as payroll or DP.

As one Western computer salesman said of the Soviets, "They buy either for very big projects where they can't possibly get by without the latest models or for projects like the Olympics, where they have their prestige on the line and can't afford to look bad. They always buy a total package, with training and maintenance contracts included."

Kama River Plant

The foundry at the Kama River truck plant — the largest such facility in the world — is controlled by a $10 million IBM 370/145 system. IBM has also sold systems to the Intourist organization, which is finally going to automate its overseas reservations processing, and to the Soviet Olympic committee for use at the 1980 Moscow games.

Honeywell, Inc. syslems have been purchased by the state bank in Leningrad, the Zil truck plant in Moscow and the Izhevsk motorcycle factory in the Urals. Aeroflot's international operations are now being handled by a $5 million Univac system.

But for the most part, the slow-going, often slipshod computerization of Soviet industry is being accomplished with locally produced machines.

Hopes for Future

American representatives admit that sales have not lived up to the expectations they had when they first arrived in Russia, but what keeps them from packing up and going home is the belief that eventually things have to get better.

"This economy demands growth to keep it going," one American explained. "To get growth, the Soviets either have to put in new capital and labor or improve productivity.

"Capital is tight, and they can't count on increasing their labor supply much longer because the population growth rate isn't high enough. So that leaves only one option — improving efficiency and increasing productivity. The best way they can do that is to computerize industry.

"Take one example. Right now there is probably no machine-tool monitoring in Russia. They have no way of knowing just how fully their equipment is being utilized. How much longer can they go on like that?"

Nevertheless, no one expects the situation to improve dramatically in the future, since the Soviets are painfully short of hard currency and spend most of what they have on grain and oil and gas drilling equipment.

Lengthy Delays

Soviet-American computer deals cannot be finalized without a U.S. government export license, and manufacturers complain that sales are being hurt by unnecessarily long delays and cumbersome licensing procedures. Some sales take longer than one and a half years to be approved, while others are eventually turned down.

Analysis

For example, last year, Control Data Corp. was denied permission to sell the Soviets its ultramodern $13 million Cyber 76, which the Soviets said would be used in weather forecasting. The U.S. feared it would give the Soviets vital information about CDC's Cyber 74, which is the brain of the U.S. defense system.

Licenses generally impose certain conditions on sales, and the manufacturer frequently is required to monitor his machine for months or years to make sure the Soviets are using it only for the purpose listed on the license application.

In earlier years companies were often required to have an observer stationed at the job site, but today machines are programmed to make periodic memory drops that can be collected and sent to company headquarters.

Fundamental Problems

Western experts believe the shortcomings in the computer field in Russia result from the same problems that afflict Soviet industry in general: a debilitating research and development lag, a low level of technology and production techniques, a lack of communication and coordination between manufacturers and a lack of quality control.

In addition, the computer industry got off to a late start because it had to develop practically from scratch, since neither the machine industry nor the electronic equipment industry was well developed in Russia at that time. Also, the Soviet Union, unlike the U.S. and other Western countries, never developed a high-powered calculating apparatus industry.

The first Soviet computer was designed in 1948, but production was postponed until 1953, mainly because an ideological campaign was being waged against the new machines and the "bourgeois science" of cybernetics that had developed them.

The principal reason the Soviets are so far behind in computer design, experts believe, is their inability to master chip technology — placing large numbers of miniature circuits on tiny silicon chips or plates about one-half square inch in size.

U.S. engineers can cram up to 50,000 components on a single chip, while the Soviets have difficulty placing 2,000 components on a chip.

Own Problems First

At least one Western source believes the Soviets must iron out the bugs in their own computer industry before they will begin purchasing a significant amount of computers and computer-related equipment from the West.

"Most of their allocations for computers are going to be spent on developing their own capacity to satisfy their own need," the source said. "And from their point of view, that's the only approach that makes sense. Then they can worry about purchasing specialized equipment that is too expensive or too tricky for them to manufacture.

"And when that happens, Western computer firms are going to start making big money in Russia."

Ross is a Chicago psychologist.

Memorex to Supply NCSS

SANTA CLARA, Calif. — Memorex Corp. has received a $4.9 million contract from National CSS, Inc. (NCSS) for Memorex 677 disk storage drives, Model 1270 terminal control units, disk controllers and related services.

NCSS, a major time-sharing organization, will use the Memorex equipment in its 3200 distributed processing minicomputer system that employs IBM 370-compatible software for data base management and in-house timesharing applications.

Memorex started shipping the 1270s and 677s in June and will deliver the bulk of the equipment over a two- to three-year period.

Other Awards

Control Data Corp. has received a $1.2 million contract for a central DP system at Patrick Air Force Base, Fla. The system will provide range safety data for the Trident missile test program.

Computer Devices, Inc. has signed a contract to provide more than 400 desk-top time-sharing terminals to Interactive Data Corp.

Contracts

Applied Devices Corp. was one of two companies awarded an $18.8 million contract to provide and manage systems equipment for an electronic lottery game operated by Quebec province. The other company is Comterm Ltd., based in Pointe Claire, Quebec.

Computer Sciences Corp. has been awarded a $129.6 million contract to process claims for California's Medi-Cal program. The contract runs for 5 1/2 years.

The Software Co. has entered into a contract with Service Aids, Inc. for the purpose of designing, developing and installing an interactive software package.

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Sweda Gets Housewares Chain's POS Order

PINE BROOK, N.J. — Sweda International has received a $2.35 million order for 50 point-of-sale (POS) cash registers from Handy City, a retail houseware and hardware division of W.R. Grace & Co.

After a one-year study of all manufacturers' POS equipment, Handy City selected Sweda Model 800 cash register terminals and Model 8805 data collectors to help track its merchandise by product line, the firm said.

Sweda will deliver POS systems to Handy City's 23 existing chain stores and to 27 new stores by the end of next year.

Other Orders

American Medical International, Inc., which owns and operates more than 50 acute care hospitals around the world, has ordered 18 I-8200 systems from the NCR Corp. as part of a distributed processing network. The systems are valued at more than $1.3 million.

Peoples Drug Stores of Maynard, Mass., has placed a $1.1 million order with Data Terminal Systems, Inc. (DTS) for 500 Model 440 stand-alone electronic cash register systems. The Jack Eckerd Corp. has ordered 1,000 DTS Model 220 systems valued at $1.25 million. Eckerd is headquartered in Clearwater, Fla.

The General Services Administration has purchased 17 Model 1200 printing systems valued at $2,040,000 from Xerox Corp. They will be used in general business applications, such as accounting, inventory control and payroll.

Orders & Installations

Accounting Systems Corp. has ordered 21 Model 404 distributed data entry and processing systems from Sycor, Inc. The systems, with a value of approximately $185,000, will be used by large property management firms as part of an automated property management service.

K Mart Corp., a discount store chain, has ordered additional electronic register systems valued at more than $10 million from NCR Corp.

Wal-Mart Stores, Inc., a discount department store chain, has ordered 1,000 Model 440 electronic cash registers from Data Terminal Systems, Inc. for $2.75 million.

Tandy Corp. has ordered 250 System 70 small business systems from Applied Digital Data Systems, Inc. The order is valued at approximately $1 million.

Wiener Corp., a New Orleans-based retail shoe and apparel chain, has purchased 100 Model 2200 point-of-sale terminals and 100 Model 2300 OCR-A readers, with supporting polling and conversion and editing software, from Chase Computer Corp.

William M. Wilson's Sons, Inc., a manufacturer of gasoline pumps and fuel distribution systems headquartered in Lansdale, Pa., has ordered a 90/40 system from Univac for on-line purchasing, order entry, inventory control and engineering control.

Display Data Corp. of Hunt Valley, Md. has ordered 5000 Regent CRTs from Applied Digital Data Systems, Inc. The value of the agreement is estimated at more than $3 million.

Cole County, Mo., has ordered its first system, a Univac 90/30, which will be used for local government applications.

The Fermi National Accelerator Laboratory has ordered three Cyber 175 systems from Control Data Corp. The contract is valued at approximately $10.6 million.

CPU, Inc., a DP service bureau that serves credit unions, has ordered 100 Model 290 on-line CRT systems from Sycor, Inc. The total purchase value is estimated at approximately $1.6 million.

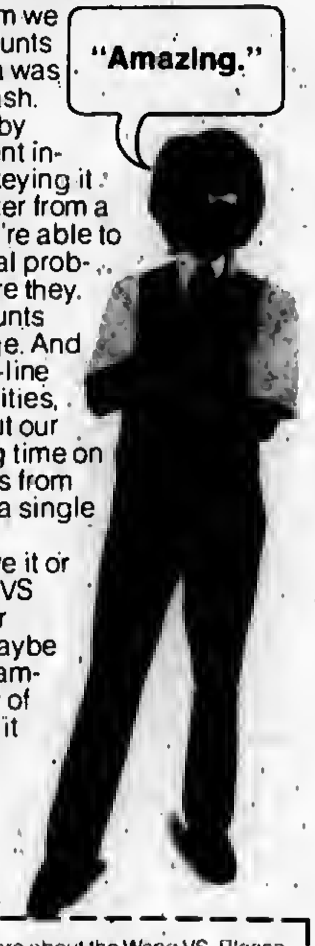
Ford Motor Co.'s Car Engineering Division in Dearborn, Mich., has ordered computer-aided design and computer-aided manufacturing systems from Computervision Corp. The orders are valued at $1.4 million.

NLT Computer Services Corp., a Nashville, Tenn., direct mail firm, has installed an IBM Model 3800 printer. A second 3800 is scheduled for installation within the year.

The Amplex Division of Chrysler Corp. has ordered two Model 445 distributed data processing systems from Sycor, Inc. The systems have a value of approximately $150,000 and will be used in the division's Detroit and Van Wert, Ohio, facilities.

Arby's, Inc. has ordered Model 2160 fast-food systems consisting of point-of-service terminals, a receipt printer, a slip printer and a microcomputer-based processor from NCR Corp.

'You've Neglected It . . .. It's Dying of a Broken Heart, Er, Terminal.'



EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer — the Burroughs B1700 — with card input sequential files and no video displays, we suffered long delays and storage constraints.

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds — all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested — all by only two people — and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software.

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it: Thanks to the programming power of the VS, I actually came up with more.

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."

EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason.

The VS is a remarkably sophisticated, fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment.

The VS provides for distributed data processing, thus avoiding costly consumption of mainframe resources. It's fast, responsive, ease to use and can support up to 2.3 billion bytes of on-line storage. What's more the VS speaks EDP people's language: COBOL, BASIC, RPG II and ASSEMBLER.

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One more thing: the entry level price of the VS is under $50,000. Which is perhaps the most remarkable thing of all about this computer.

For more information on the VS, return this coupon to Wang Laboratories, Lowell, MA 01851.

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- **Distributed Intelligence Architecture/Interactive Systems Software Architecture**
- **Fifth Generation OS Architecture/Interactive Systems Software Architecture**
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	Ind. Life-New England	to $25,000
Sr Analyst -	Ind. Life-Northeast	to $28,000
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Sr Programmer -	Ind. Life - ALC-Midwest	to $25,000
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Documation, a computer subsystems company experiencing explosive growth, has a corporate headquarters opening for an experienced Systems Engineer or Systems Programmer, to do selected customer software customization and pre-post sales software support.

REQUIRED experience includes a high degree of proficiency in IBM 360/370 BAL programming, and working knowledge of HASP or JES - preferably in an RJE environment. Data communication experience would be a plus.

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WHO ARE WE?

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WHAT TECHNOLOGY ARE WE USING?

A strong program that blends IR&D, contracts and internal projects gives us the opportunity to participate in technological developments at the leading edge of software science. Our current high-technology contracts include:

- ★secure operating systems development
- ★distributed data-base studies
- ★high bandwidth local computer networks

Here are some of the areas which are particularly important to Western Development Laboratories.

UNIX-based* Software Engineering
- —PWB/UNIX
- —Development support systems
- —Software development tools
- —Specification languages

(*UNIX is a trademark of Bell Laboratories)

Reliable Systems Technology
- —Formal specification & program verification
- —Secure computer systems
- —Test and validation

Distributed Systems Technology
- —Data base management systems
- —Real-time data collection
- —Local network prototypes
- —Network protocols

Operating Systems Architecture
- —Capability-based systems
- —Network systems (micro, mini, midi, maxi)

WHAT JOBS DO WE HAVE?

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You will use modern systems programming languages running in PWB/UNIX environment to develop operating systems, software tools, DBM's, and network implementations. These positions provide excellent opportunities for technical growth.

Operating System Designer
You will draw upon your experience with several operating systems, your academic training, and your aiblity to conceptualize and communicate in order to design and specify a new class of operating system. You will learn to express your design in a formal specification language and to subject your specifications to rigorous analysis.

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You will break new ground in design of test methods for provably secure systems. Using your familiarity with modern software testing methodologies, you will interact with the systems design team. As a result, you will become familiar with formal mathematical specification techniques for software.

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You will work in a PWB/UNIX environment to create tools to make the software development process more exact and less error-prone. Your major contribution will be the direction of research and development that leads to the next generation of software tools.

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Your knowledge of modern compiler-building technology and formal languages will be used in the evaluation and development of systems programming languages for use in support of our reliable systems technology efforts.

Modula Expert
You will provide theoretic and practical leadership in the design and implementation of visibility, efficiency, and maintainability extensions to a UNIX-based modula compiler. You will also consult and instruct on the use of modula and BCPL.

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You will use your knowledge of MIL-S-52779 and modern software QA systems to develop and apply WDL-wide software QA methodologies. Knowledge of modern systems development practices and high level systems programming languages is also required.

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Please send your resume and salary requirements to: Professional Employment, Dept. PF-11B, 3939 Fabian Way, Palo Alto, CA 94303. Or call (415) 494-7400, ext. 6601 for immediate consideration. We are an equal opportunity employer, m/f. U.S. Citizenship Required for most positions.

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Work with some of the most sophisticated installations in the country supporting our line of IBM OS, OS/VS and MVS System Performance and Programmer Productivity products. Qualified candidates will have demonstrated an ability to work with people and should have solid experience in two or more of the following: OS COBOL programming, JCL and utilities, OS, OS/VS system tuning techniques or user training.

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You will have a degree in CS or EE; 2-5 years exclusively in design/development of a processor and/or system (not application) software.

- The working environment is highly stimulating with high visibility, receptivity to ideas and opportunity for advancement.
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- We enjoy a fabulous location near the ocean in Brevard County, with Florida attractions such as Disney World and Kennedy Space Center nearby. The living is great year-round.

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Demonstrated experience in the design and implementation of large business systems combined with manufacturing or financial applications design experience in a data base/data communications environment (CICS/DL-1, etc.) are required for this position.

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Your background should include either 2 or more years' experience in data base applications (IMS, TOTAL, DL-1, IDMS, etc.) with the desire to become a data base administrator or actual experience with data base design, gens, file security, error recovery and backup.

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PROGRAMMERS

1 or more years' experience utilizing CICS/VS, DOS/VS and ANS COBOL is required. Experience in a manufacturing environment with systems 3 or 32 is especially desirable.

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For a confidential evaluation of your professional qualifications, send your resume to: Russell C. Karpick, AVX Ceramics, P.O. Box 867, Myrtle Beach, South Carolina 29577. AVX is an equal opportunity employer m/f/h.

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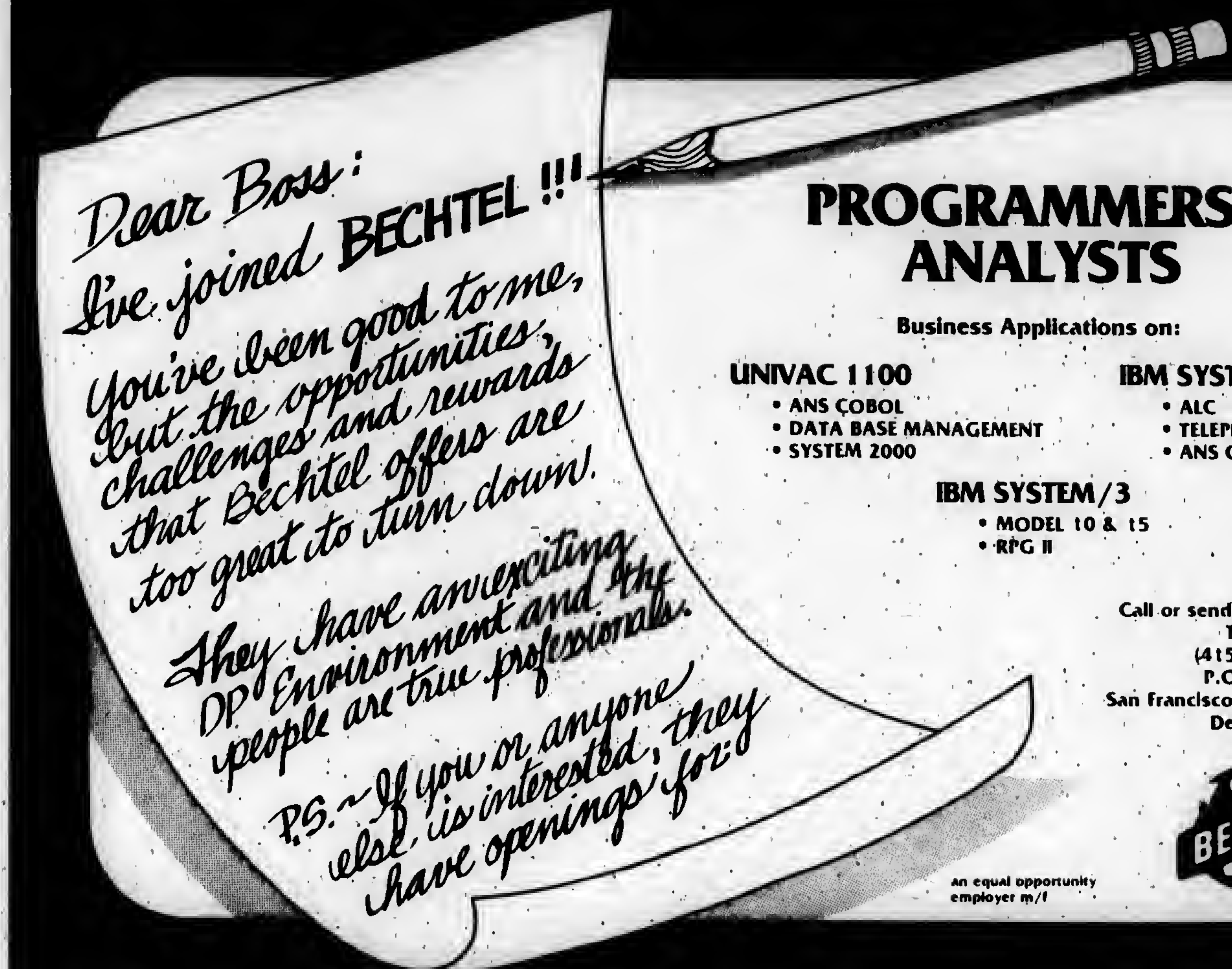

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- ALC
- TELEPROCESSING
- ANS COBOL

IBM SYSTEM/3
- MODEL 10 & 15
- RPG II

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Miami, Florida 33169
Telephone (305) 685-[illegible]

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Los Angeles, California 90010
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— are interested in an excellent salary, bonus, mileage and expenses
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As a result of our continued growth and expansion programs, openings now exist in all regional areas of the United States. If you would like to be considered as a new member of our team, call one of our regional managers in the region that interests you to arrange for an interview. Yes, we do have a relocation policy. Selected candidates should provide a detailed resume of their work history and accomplishments to:

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(313) 478-2640

Eastern Region:
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377 Route 17
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(201) 288-6560

Western Region:
Ken Felderstein
1055 S. East Street
P.O. Box 4883
Anaheim, CA 92803
(714) 778-4800

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An opportunity exists for an individual who has field or training experience as a Customer Support Person.

Your duties include:
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- Development of advanced programs.
- Working with Word Processing Marketing Organization to coordinate up-date training of internal Personnel.

Qualifications:
- Minimum of 2 years of field or training experience as a Word Processing Customer Support Persnn.
- Ability to take on Project responsibilities.
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- College education desired, but not necessary.

To apply for these and other positions we have available for computer professionals, send your resume including salary history and requirements to:

Linda G. O'Connor, Career Opportunities
(617) 851-4111

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Computers
WANG
Word Processing

Project Manager Manager Technical Support Sr. Systems Analyst

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Essential requirements include several years experience with ANS/COBOL/OS operating systems, and knowledge of JCL. Also preferred is a background in IMS/DL1, TSO, RJE and MARK V. Exposure to manufacturing application areas will be a valuable asset.

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THE FACTS: Harris Corporation designs, produces, and markets high-technology communication and information processing equipment and systems. Its products are used throughout the world in voice and video communications, data processing, data communications and graphic communications.

Fiscal 1978 was another record year in sales and earnings for Harris. Sales increased 35% to $872 million. This trend reflects the growing importance of the communication and information processing industry in the world economy, and the emergence of Harris as a broad-based producer of equipment for that industry. For the first time new orders received in fiscal 1978 exceeded the billion-dollar milestone.

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THE FANTASY: Where better to live and work than Florida. America's year-round vacationland and fast emerging technical community. Melbourne, Florida, home base for Harris, provides easy access to a wealth of educational, recreational and cultural facilities and a cost of living profile the envy of almost any U.S. city. The scenic beachfront community of Melbourne is only an hour's drive from Disneyworld, a short hop from the Florida Keys or even a 20 minute flight to the excitement of the Bahamas.

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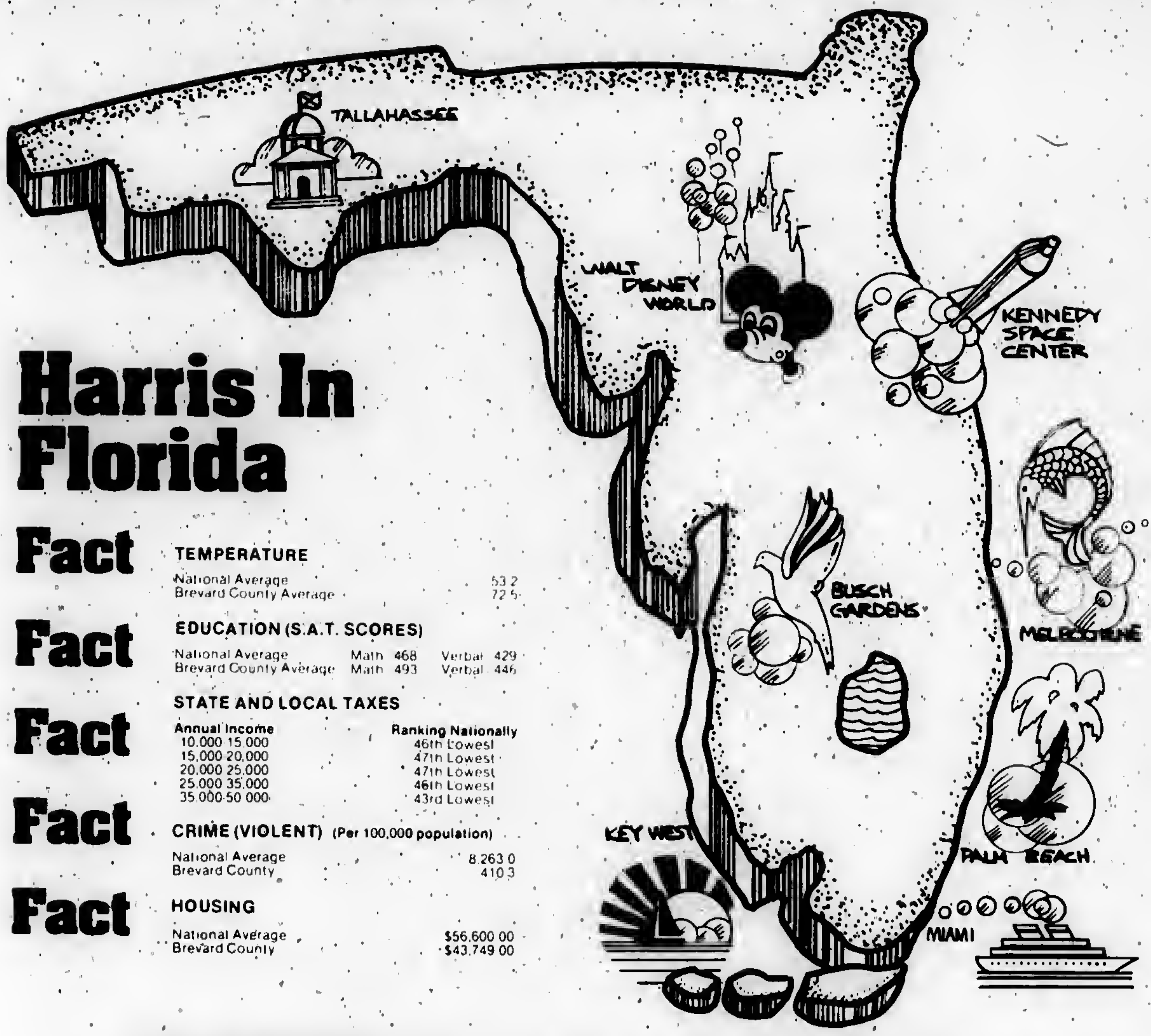

Harris In Florida

Fact TEMPERATURE

National Average	53 2
Brevard County Average	72 5

Fact EDUCATION (S.A.T. SCORES)

National Average	Math 468	Verbal 429
Brevard County Average	Math 493	Verbal 446

Fact STATE AND LOCAL TAXES

Annual Income	Ranking Nationally
10,000-15,000	46th Lowest
15,000-20,000	47th Lowest
20,000-25,000	47th Lowest
25,000-35,000	46th Lowest
35,000-50,000	43rd Lowest

Fact CRIME (VIOLENT) (Per 100,000 population)

National Average	8,263 0
Brevard County	410 3

Fact HOUSING

National Average	$56,600 00
Brevard County	$43,749 00

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- Time Sharing (VM/CMS)
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A requirement is a B.S. degree in Computer Science, Mathematics, Engineering or related fields.

For immediate consideration, call 1-800-243-3342 toll free or send your resume (including salary history) to Professional Recruitment, Office 124, Pratt & Whitney Aircraft Group, East Hartford, Conn. 06108.

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Mr. Robert L. Lenington
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Diagnostic Prog **dev. software programs**	**to 23K**

Many positions lead into management and all are with outstanding companies. We are where the action is . . . let us make it happen for you! Dig out that old resume and call J. Lefkowitz collect at 305/891-4801. Corporate Advisors, Inc. 12955, Biscayne Blvd., Miami 33181.

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We need an experienced programmer for a cardless System 3, Model 15D, with CCP. RPG II and on-line (CCP) experience mandatory. Manufacturing experience desirable. Excellent salary and benefits. Send detailed resume including salary requirement to:

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Little Rock, ARK 72219

ASSISTANT DIRECTOR OF EDP

STATE OF FLORIDA

State agency recruiting for Assistant Director of EDP in Tallahassee, Florida. Requires graduation from accredited 4 year college or university and 6 years professional experience in the development or administration of electronic computer systems, 3 years of which must have been in a supervisory capacity. Progressively responsible experience as required above may be substituted on a year-for-year basis for the required college training. Beginning salary $23,552.64. Qualified applicants submit resume to Recruitment Officer, Department of General Services, 433 Larson Building, Tallahassee, Florida 32304 (904) 488-2707.

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Client cos pay all employment costs. Contact in conf Don Owens, 215/561-6300. FOX-MORRIS PERSONNEL CONSULTANTS, 1500 Chestnut St., Phila, PA 19102

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Syst Prog (VS1 or CICS)	To 28K
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50 CALIFORNIA STREET, SUITE 3550
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Product Planning Group Leader

THE POSITION

Staffing and organization of a Product Planning Modeling Lab. The purpose of the modeling lab will be to synthesize Functional Models (breadboards, prototypes) which will demonstrate the functional aspects of the end product. This department has been budgeted for 2-3 additional professionals.

This group will interact with the members of Product Planning in providing technical support in terms of components, peripherals, operating software, costs and schedules and also participate in scenarios and planning sessions to determine the future impact of new developments on the market place.

THE CANDIDATE

This position will require a BS in EE, Physics or Computer Science and at least two years of experience designing, constructing and testing of functional products using digital electronics and microprocessors. Supervisory experience will include a minimum of two years of supervising a group of professionals. The ideal candidate will have completed a project utilizing minicomputer or microprocessor development systems including hardware and software integration.

THE COMPANY

Monroe is a division of Litton Industries and is an international supplier of calculating and desk top computing equipment to the business market. The position would be in the World Headquarters in Morris, Plains, New Jersey.

We'll provide a commensurate salary and outstanding benefits as well as unusual potential for professional development and career growth. Send resume, including salary history to: Mr. Barry A. Depew.

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VERSATEC, on the SAN FRANCISCO PENINSULA, the leading manufacturer of electrostatic printer/plotters, currently has a challenging opportunity in the unique area of graphic software development for a

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Initially, you will assume responsibility for developing graphic plotting software on mini-computer systems while gaining a broad knowledge of several popular mini-computer systems. 1-2 years previous FORTRAN and assembly language programming on Hewlett Packard 2100 computer system helpful.

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PROGRAMMER/ANALYST
Denver, Colorado

Industry leader has position open that offers ground floor opportunity in development of on-line, integrated general ledger, inventory, accounts payable and specialized management reporting systems using TOTAL DBMS on a PDP11.

Qualifications:

1. One year solid experience in applications programming under RSTS/E on PDP11.
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3. Ability to work and communicate well with both EDP and user personnel.
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Special consideration for anyone with TOTAL experience. If you are interested in this rare opportunity, send your resume to:

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Will have total responsibility for all system software. Must have DEC 20 or DEC 10 experience.

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Any DEC or timesharing experience. Will train.

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System Sciences Division
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Silver Spring, MD 20910

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THE POSITION: We will be opening our new computar rafurbishing center soon in a desirable Minneapolis suburb, and need a person to configure, test and stage IBM GSD computer equipment (primarily system/3) prior to deliver. Some installation in the field is required. Excellent salary, complete benefits including moving expenses.

THE QUALIFICATIONS: The ideal candidate will be technically knowledgeable of the IBM GSD products, primarily System/3. Experience from either IBM or a 3rd party maintenance firm is acceptable. We need a career minded, self starting individual with a problem solving attitude.

THE COMPANY: Data 3 Computer Corporation is a leader in the purchase, sale and leasing of IBM GSD products. The new computer refurbishing center will enable us to maintain rapid growth in this dynamic industry. For information and an appointment, call Bob Johnson Collect. ALL INOUIRIES WILL BE HELD IN STRICT CONFIDENCE.

DATA 3 COMPUTER CORPORATION

P.O. Box 266 **(612) 682-4884 Buffalo, MN 55313**

MINICOMPUTER SOFTWARE ENGINEERS — International software co. needs software engineers for design and development of mini and micro software in areas of TP and real-time systems. Duties involve analysis, design, implement systems software. 3-4 yrs. exper. on mini's (ICL, PDP-11, Nova) and/or micro's (8080, 6800), salary range mid-teens - low 20s. Europe travel possible. PARAMIN LTD., 141 Linden St., Wellesley, MA 02181 (617) 235-0495.

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WE OFFER:

- Excellent salary and benefits
- Profit sharing
- Orlando Florida location
- Paid relocation

We are seeking a data processing professional with a minimum of 4 years' experience in COBOL programming. Additional prerequisites include exposure to systems design and project leadership in a 370 environment.

If you qualify send your resume with salary history to: Dept. RBG, Red Lobster Inns of America, Inc., P.O. Box 13330, Orlando, Florida 32859.

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SYSTEMS ANALYST

Armour Dial has immediate opportunity for an individual with approximately 2-4 years programming experience in a real time, multi-programming environment. This new position is an integral part of a state-of-the-arts data acquisition, control, and management information system being installed in our food operation. A computer degree is desirable but proven experience is the key.

Responsibilities will include real-time operating systems enhancement and maintenance, systems analysis and software systems consultant to members of the computer systems department. Some application programming in Fortran and/or assembly language may also be required.

This position located in the pleasant river community of Ft. Madison, Iowa offers challenge, visibility and the opportunity to work with a team of aggressive professionals. You are invited to submit a resume and salary requirements specifying hardware and software experience in assured confidence to:

Employee Relations Supervisor

ARMOUR DIAL COMPANY

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DATA BASE ADMINISTRATION

Honeywell 6600

Commitments to comprehensive computer systems development utilizing Honeywell's DMIV software have created a need for additional data base specialists within the Corporate Data Base Administration department of a leading Management Service Organization.

DATA BASE ADMINISTRATOR - Requires previous experience as either a DEA or DBMS software support specialist, including at least 3 years of IOS and TOS responsibility. Some travel required. Responsible for physical design, implementation, and support of totally integrated, corporate-wide data base utilizing DMIV.

APPLICATION SUPPORT ANALYST - A strong application programming background with a minimum of 3 years experience utilizing IOS and TDS is required. Will act as technical consultant to the Systems and Programming department.

Initial assignments (long term) will be with our Wilton, Connecticut based Relocation Management subsidiary. Full DMIV training will be provided. Offer includes competitive salary, liberal benefits, a comprehensive relocation package and a professional working environment with excellent career opportunities. Qualified applicants are invited to send resume, in confidence to:

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These positions are career openings with excellent opportunities for rapid advancement and professional development. Starting salaries are commensurate with education and experience. An advanced technical degree or management degree with an information systems specialization is required. Please submit resume and current salary in confidence to:

Dr. Craig M. Cook
ARTHUR YOUNG & COMPANY
1025 Connecticut Ave. N.W
Washington, D.C. 20036
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ARTHUR YOUNG

PROGRAMMER/ ANALYST

Corning Community College is now accepting applications for the position of Programmer/Analyst in its computer center. Duties require experience in DOS, Power, Cobol, RPG and Fortran. Minimum requirements: Associates Degree in Business Data Processing with one year actual programming experience or minimum of three years actual programming experience. Interested candidates should submit a detailed resume with salary requirements to:

Director of Personnel
Corning Community College
Corning, New York 14830

Deadline for filing applications is December 11, 1978.

Corning Community College is an Equal Opportunity/Affirmative Action Employer, adheres to the guidelines of Title IX, and does not discriminate against handicapped.

COMPUTING CONSULTANT

Mississippi State University invites applications for the position of computing consultant in the Department of Computer Science. Responsibilities of the position include assisting university faculty and staff with various computing and programming projects. Applicants should have experience and/or training in computing and should have an ability to work with others. A bachelor's degree is required, but a master's degree is preferred. Applicants should forward a resume and a list of references to:

Prof. Gerald A. Matthews
Crdtr of Computing Services
Dept. of Computer Science
Mississippi State Univ.
P.O. Drawer CS
Mississippi State, MS 39762

Mississippi State University does not discriminate on the basis of race, color, religion, national origin, sex, age or handicap.

DATA PROCESSING OPPORTUNITIES

Progessive, dynamic, credit insurance company looking for programmer analyst capable of management opportunities. Educational and/or work experience in finance accounting/management areas of value. Finest fringe package available. Salary open.

Send a detailed resume and salary history to P.O. Box 300, Southfield, Michigan 48037, Attn: Robert Cahill

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Wanted

to work with the academic activities of a college computer center. Position involves programming and consulting in a variety of computer languages. Salary $14,000-17,500 (based on qualifications) with one month vacation and State benefits. Minimum requirement of a Bachelor's degree (or equivalent) and significant computer experience. **Apply before December 22, 1978 with resume to: Dr. Lee T. Bryant, Computer Center, State University College, Geneseo, NY 14454.** An Affirmative Action/Equal Opportunity Employer.

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INFORMATION SYSTEMS ANALYST responsible for developing an integrated university-wide student system. Candidates must have the ability to communicate with a diverse group of administrative users and be able to specify system requirements to the administrative computing department. Minimum requirements include a bachelor's degree and experience in systems analysis and design. Salary: $15,000-$17,000. Send Resumes to: Dr. Frank Birtel, Acting Provost, Office of the Provost, Tulane University, New Orleans, Louisiana 70118, by January 31, 1979. Affirmative Action/Equal Opportunity Employer

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Data Processing

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For confidential consideration, send resume (including salary history) to: KAMAN SCIENCES CORPORATION, Attn: RS, P.O. Box 7463, Colorado Springs, Colorado 80833.

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ATTN: FL
P.O. Box 7463
Colorado Springs, CO 80933

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Put Your Experience To Work For You In Building A Better Career Opportunity

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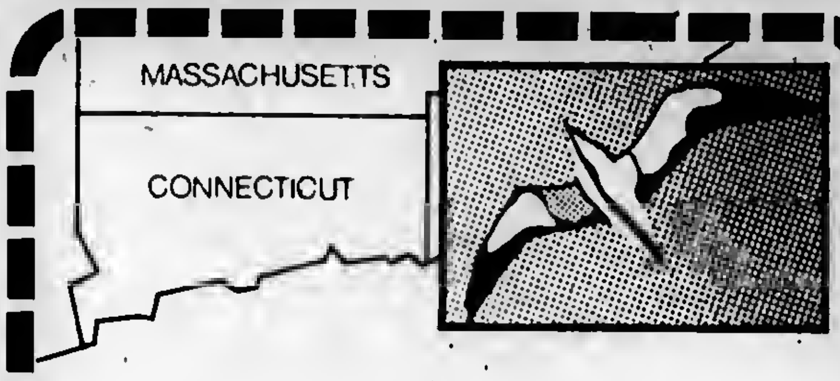
We are a large, rapidly expanding food processing company located in Seattle, Washington with an opening for an experienced Programmer/Analyst. We are looking for an individual with accounting, order entry and inventory control background. This person will assume responsibility for maintaining and enhancing current systems on a Datapoint 5500. The ability to document systems is a plus.

Our company offers good job security, competitive salary and company-paid benefits. Company pays relocation expenses. If interested, please send your confidential resume with salary history and requirements to **Pacific Pearl Seafoods, 1450 - 114th Ave. S.E., Bellevue, WA 98004.** An Equal Opportunity Employer.



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For a high-level review of your qualifications, and a prompt briefing on the exceptional career opportunities and lifestyle you can enjoy at NCR/Columbia, call Mr. Kenneth Uhlig, toll free: 1-800-845-0586. Or send your resume and salary history to him at: NCR Corporation, Engineering & Manufacturing, Department S50, 3325 Platt Spring Road, West Columbia, South Carolina 29169.

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A Fortune 200 manufacturing corporation seeks a qualified individual to contribute in a senior staff capacity tu the improvement of corporate wide information systems plans and methodologies for computer application development and EDP hardware/software and related telecommunications use.

The person selected should hava previous experience in the use of structured analysis/programming techniques, and be capable and interested in guiding their introduction and use. First-hand involvement in EDP technical training, standards development, or herdware evaluation is a definite asset.

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Our client, a well-recognized, expanding Mid-Atlantic technical services firm, seeks an experienced manager to direct its computer center. The successful candidate will heve a strong ability to manage a minicomputer installation, to convert user requests into operational systems, and to provide technical guidance. Background should include a degree with 5-10 years in a technical or service environment. Knowledge of Fortran, RPG II and COBOL would be an esset. All employment costs, including our fee, ere paid by the client. Please respond in strictest confidence by resume or phone to Bob Mansfield at (701) 947-6920.

FOX-MORRIS
Personnel Consultants
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Programmer/Analyst

Minimum 3 years EDP systems and programming experience in the manufacturing industry. Must be proficient with COBOL and thoroughly familiar with IBM 370 systems using OS/VS2 SVS and HASP. Requires a minimum of 2 years systems design and analysis experience. An excellent opportunity with a rapidly growing company with the EDP staff located at corporate headquarters.

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(213) 922-6311

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Affirmative Action Employer

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Applications ere being accepted by the Fairfield-Suisun Unified School District for Programmer/Analyst. Applicants must have experience in COBOL in a time-sharing environment. DEC Experience valuable. Contact the Personnel Office, 1025 Delaware Street, Feirfield, CA. 94533 (707) 422-3200, Ext. 36. Applications will be eccepted thru Wed. Dec. 27, 1978.

PROGRAMMER/ ANALYST

City of Roanoke, Virginia

Performs complex work in development, design and preparation of computer programs under the general supervision of the Systems and Programming Supervisor.

Must have education and experience equivalent to graduation from an accredited college or university with major work in Computer Science and considerable experience in Computer Programming. Cobol experience required

Salary: $15,431.00 - $19,734.00. Send resume to: C.N. Patterson, Jr., Dept. of Personnel Management, Room 207-A Courthouse, 210 Campbell Ave., S.W., Roanoke, Va. 24011.

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PROGRAMMER

Any combination of training and experience equivalent to college graduation in business administration, engineering or methematics, plus 2 years of applicable computer programming experience. Experience with large-scale computers in a timesharing environment is preferable.

Liberal fringe benefits. Must be a U.S. citizen. Replies held confidential.

Send resumes to: Ms. Trudie L. Rainey, M/S 567, Reynolds Elec. & Eng. Co., Inc., P.O. Box 14400, Las Vegas, NV 89114

Leading medical facility in Central Texas has vacancy for experienced programmer analyst. Fast growing data processing shop. Analyst will be thrust into ambitious development schedule in a DOS/VS, CICS, OL/1 and distributed processing environment. Applicants must have minimum of 5 years Programmer Analyst experience and must have OB/DC and COBOL skills. Salary negotiable. Excellent benefits including free parking and 100% free outpatient medical services on self and dependents.

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TWA
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PARS FILE SUPPORT

Perform file reorganizations database conversions; enhance/maintain file support programs; working knowledge of the PARS file support programs, database organization, and 3340 based storage systems.

PARS TEST VEHICLE SUPPORT

Perform test systems generation, enhance/maintain test vehicle programs and test tool programs; working knowledge of PTV, realtime trece facilities.

ACP SYSTEMS SUPPORT

Maintain ACP realtime software, evaluate new support requirement/enhancements, develop modifications; working knowledge of internals of ACP release 8.1 and beyond to include 3340 and Hypervisor support.

PARS COMMUNICATION SOFTWARE SUPPORT

Enhance/maintain CCP, CCP support progrems, 3705 EP, Network Control programs, PARS Message Switching programs; familiarity with communications data base structure; working knowledge of airlines line control, BSC end IATA link controls.

MVS/JES3 SYSTEM SUPPORT

Perform system measurement/tuning using GTF, RMF, SMF and/or other tools; Perform system generations enhancements, maintenance and provide local user support; Must be familiar with COBOL, FORTRAN and/or PL/1 language in a virtual system environment.

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Must have working knowledge of one or more of IBM telecommunication subsystems - NCP, VTAM, TCAM; IMS; Perform system maintenance, tuning, enhancements, and provide OBA/application support using COBOL, FORTRAN and/or PL/1 languages.

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Perform system generations and maintenance of the VM operating system; develop and maintain enhancements to support local user needs.

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We seek a creative systems analyst with excellent technical and communications skills. The candidate should have 2-5 years of systems analysis experience with demonstrated abilities in the design and implementation of new financial/accounting systems in a corporate environment.

Prior exposure to minicomputers, distributive processing and data base environments is important. A Bachelor's degree in a business related field required. Prior programming experience with exposure to mining, construction or transportation industries would also be helpful.

Good benefits. Salary range $18,000 - $22,000 per annum depending on experience and training. Please submit resume including salary history to NORTHERN ENERGY RESOURCES COMPANY, Personnel, 529 S.W. Third, Portland, OR 97204. An equal opportunity employer.

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NCR San Diego launches major new corporate data base programs.

Your immediate involvement will be with systems ranging from small to large, utilizing advanced technology. This will include the design and implementation of Data Base Management Systems including Data Dictionary Facilities, Query/Update Languages, DDL Compiler, Data Manipulation Languages, and Data Base Utilities.

The programs are broad in scope and apply to a wide range of products that will be fully integrated with NCR's present and future systems.

This ground-floor opportunity offers a creative environment and high visibility within the corporation.

To qualify, you'll need a minimum of two years experience in Data Base Systems. COBOL experience is a plus.

The facility itself is centered within the major San Diego area. It sets atop a hill and covers 114 acres. The off-job living is ideally suited to those who like the outdoors. It is one of California's finest recreational areas and includes 70 miles of beaches, from San Juan Capistrano to the Mexican border. It is close to major metropolitan cultural centers.

For complete information, call collect (714) 485-3356 and ask for Mr. Walt Kleffel, or send your resume and salary history, in complete confidence, to him at NCR Corporation, Systems Engineering, Department **S50**, 16550 West Bernardo Drive, San Diego, California 92127.

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Prestigious consulting firm seeks sharp EDP auditor with degree in acctg. & bus. programming exp. Bank or ins. apps. pref. Must have excellent bearing & communication skills. Hi-visibility pos. in a diversified environment. Salary to $23,000. Contact Gerry Battista. (Fee Paid)

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FACULTY OPENINGS-
-INFORMATION SYSTEMS

Information Systems Department - Anticipates at least one faculty opening (contingent upon funding) starting September, 1979. Assistant to Full Professor. Salary dependent upon qualifications. Qualifications include a doctorate or a willingness to pursue same, sincere interest in teaching, 3-5 years experience in either systems design, data base management, small business computers, or EDP auditing. Closing date for application is January 15, 1979. Equal Opportunity Employer. **Send resume to: Dr. David G. Foley, Acting Dean; School of Business Administration; California State Polytechnic University, Pomona; 3801 West Temple Avenue; Pomona, CA 91768.**

DATA PROCESSING PROFESSIONALS

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Astute data processing management recognizes the value of a strong quality control effort in assuring achievement of systems goals, utilization of standardized methods to design and implement systems, and optimal performance of both software and hardware. Such management is extremely supportive of quality assurance and provides appropriate authority for performing the function. Such management exists at Dominion Bankshares Corporation.

Your challenge as a Quality Control Analyst will be to assist the Manager, D.P. Standards and Quality Control in building a new department to coordinate the planning and implementation of all hardware or software changes to ensure compliance with standards in a twin IBM 370-158 OS/VS1 environment. Responsibilities include reviewing systems during the feasibility, design, programming, testing, and conversion phases to ensure high quality of systems; reviewing general controls; advising project teams on design and programming technology; and coordinating systems changes between Systems and Programming, D.P. Operations, and Technical Support.

While an ideal candidate would possess intensive knowledge of review techniques, our search is directed towards individuals who are personally convinced of the importance of quality assurance and who are willing and able to devote the necessary effort to make the function successful. You must possess a thorough understanding of systems design and programming (at least five years experience in this area); exposure to operations and technical support is a plus. Understanding of internal controls and strong verbal and written communications skills are also essential.

If you are interested in embarking on a new, expanding career path that will provide you with excellent exposure to all areas of data processing, thereby enhancing your growth potential, send a resume including salary history to Barry L. O'Donnell, Assistant Personnel Officer, DOMINION BANKSHARES CORPORATION, P.O. Box 13327, Roanoke, VA 24040.

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INDIANA UNIVERSITY
DIRECTOR OF MANAGEMENT SYSTEMS

Indiana University invites applications and nominations for the newly created position of Director of Management Systems. The Director will report to the University Director of Information and Computer Services.

Responsibilities:

The Director of Management Systems is responsible for the design, development, implementation, maintenance, and evaluation of new, or significantly revised, management information systems throughout Indiana University. Related management responsibilities include customer and internal training plans and programs and the development of internal management systems and procedures. The Director will supervise 38 full-time positions. The primary computer supporting these systems is an IBM 370/158-3AP with 5 megabytes of memory. Software includes MVS, CICS, MARK IV, and SYSTEM 2000.

Qualifications:

Training and experience in information systems design, management of computing applications, data base technology, ten years of progressively successful management experience in a large scale organizational and/or project management situation, preferably within a university environment. Five years of successful management experience in a position directly responsible for the development and implementation of management information systems, within a university environment. Superior written and verbal communication skills. Management and financial expertise.

Desirable Characteristics:

Manager or associate in such university functions as registrar, admissions, financial aids, student services, university planning, budget management, faculty records, personnel, accounting.

Appointment:

Twelve month, liberal fringe benefits, this position is open and available.

Salary: Open, depending upon background and experience.

Effective Date:

Mutually agreed to, but wish to appoint effective September 1, 1978, or earlier if possible.

Closing Date for Receipt of Application: December 22, 1978.

Contact:

Thomas W. West, Selection Advisory Committee
Bryan Hall, Room 7, Indiana University, Bloomington,
Indiana 47401. Phone (812) 337-1053

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SYSTEMS PROGRAMMERS

Here is your chance to take advantage of a full range of exciting opportunities that currently exist at the First National Bank of Boston for experienced IBM OS/VS Systems Programmers and Assembler Programmers. While providing quality systems software support to our Data Center and User community, you will be working with MVS 3.7, JES2, making extensive use of TSO on IBM 3032, 3350, and 3800 hardware.

The individuals we are seeking should have several years of OS and BAL experience and the ability to develop and present creative solutions to technical problems. On-line experience would be a plus, as we are consolidating our 3 major networks using the INTERCOM teleprocessing monitor.

The First National Bank of Boston offers a flexible working environment combined with an excellent salary and benefits to provide you with considerable latitude for personal and professional growth. If you are interested in utilizing your skills with a challenging and rewarding environment of one of the leading financial institutions in the Boston area, please forward your resume, including salary history, in confidence, to J.S. Allschwang, The First National Bank of Boston, P.O. Box 1976, Boston, MA 02105.

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Staff Assistant/Computer Programmer to work in a time sharing environment (CDC CYBER 72/NOS) assisting with development of an on-line Fiscal Management System, Student Information System, and in support of other Administrative and Academic DP needs.

REQUIRED: 3-5 years COBOL experience in management systems with good oral and written communication skills.

DESIRED: Bachelor's Degree; familiarity with SPSS, FORTRAN, TOTAL, Financial Accounting, on-line DBMS, and CDC hardware/operating systems.

SALARY RANGE: $12,935 - $18,350 + excellent benefits

APPLY TO: Screening Committee - Computer Programmer c/o Affirmative Action Office, Salem State College, Salem, MA 01970

DEADLINE: Applications must be received by January 8, 1979

SSC is an Equal Opportunity-Affirmative Action Employer and is in compliance with Title IX of the Federal Laws.

Programmer

We are seeking a qualified programmer who has demonstrated a proven background in COBOL programming, preferably with IBM 360's or 370's. Minimum of 1-2 years' experience needed. To work in medium-sized installation with IBM 370/138, DOS/VS. This is an opportunity to write and maintain programs in COBOL as well as perform systems-type duties. Competitive salary and excellent employee benefits. Send resume with salary history and requirements to: Personnel Department, Wilmington Medical Center, 501 West 14th Street, Wilmington, DE 19899. (302) 428-2774. An Equal Opportunity Employer.

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systems representative

An industry leader in minicomputers has an immediate opening for a Systems Representative in its BALTIMORE OFFICE. Major responsibilities include pre- and post- sales support, customer installation, project management, and technical assistance.

The position requires 2-3 years' experience with small on-line business computer systems, a solid understanding of accounting principles, project management, programming (BASIC preferred), and systems design. Excellent oral and written communication skills are essential. Degree is preferred.

We offer an excellent starting salary with full company benefits as well as career potential. If interested, please send resume complete with salary history in confidence to:

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For confidential consideration, please send resume to:

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Attn: WB
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Colorado Springs, CO 80933

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Major forest products company has a challenging opportunity in its San Francisco Headquarters Office for an individual with experience in development and implementation of program for a large diversified computer environment.

A position offering career growth with the company provides for exposure and interface with various levels of management. Ideal background would include College degree or equivalent, 7-10 years data processing experience, 3-5 years supervisory experience and 2-3 years audit/disaster recovery planning experience.

Excellent salary and benefits package. Please send resume and salary requirements to Bess Jones, Professional Employment, Room 802M, CROWN ZELLERBACH, One Bush Street, San Francisco, CA 94119. An equal opportunity employer M/F.

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Experience with on-line systems (CICS, ROSCOE, TSO, etc.) or knowledge of DOS or OS internals is a definite plus. If you have participated in the development of any type of software packages—system, utility, or application—we would really like to talk to you.

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5 years ago, we developed a serial tasking operating system for the industry's first 32-bit mini. We currently offer a multi-tasking operating system that can support scientific, simulation and transaction processing environments concurrently. This same OS offers an interactive program development environment.

If you seek the ultimate in technical challenge and operating systems is your specialty, join us as we continue to exploit our current and future hardware capabilities.

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Our commitment over the years to make continuing improvements in our software is evident with the recent introduction of our FORTRAN VII system. Our globally optimizing compiler is the finest ever developed. Fast execution time, comprehensive error analysis, and fast and simple program compilation added to our 32-bit architecture equates to technical sophistication we're proud to be responsible for.

If you would like to participate in ongoing development with our group of specialists responsible for the industry leading FORTRAN VII compiler, and have strong knowledge of compiler techniques, FORTRAN, and assembly language programming, we'd like to hear from you.

The above positions require a minimum of a Bachelor's Degree, with advanced degrees preferred. We offer excellent benefits and unlimited growth opportunities. For prompt consideration, call collect (201) 747-7300, or send resume including salary history to: Mr. William C. Beattie, Jr., PERKIN-ELMER, Interdata Division, 106 Apple Street, Tinton Falls, New Jersey 07724.

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The Telecommunications Engineering Division of Siemens Corporation in Cherry Hill currently has the following opportunities for highly motivated individuals who desire to begin or expand their career in the field of Text and Data Systems Development.

Positions are available at all levels of experience in the following areas:

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Previous experience with message, packet or circuit switching is a definite attribute for all positions.

Siemens, an international leader in electronics offers a comprehensive company paid benefits program including dental plan and life insurance, and provides an excellent work environment.

Please send a resume, including salary requirements to: Personnel Manager, Telecommunications Engineering Division, Siemens Corporation, 18 Olney Avenue, Cherry Hill, NJ 08034, An Equal Opportunity Employer, M/F.

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Telecommunications
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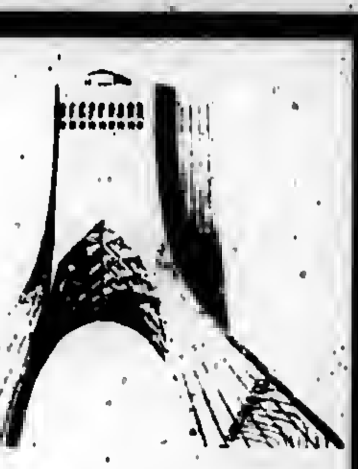

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You will develop advanced information systems in Tehran in a modern American environment. Work with the best Honeywell Systems Pro's in the field. And you will be earning, learning and seeing the world. Your personal income package will meet or exceed $50,000 Family housing provided free. USA per year, tax free of US or foreign taxes, with excellent fringes & benefits (family tours, too).

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ANALYST

This position will work closely with data system users to develop specifications for data systems to support the administrative functions of the Institute; is responsible for the total project live cycle which includes forms and file design, program specification and support, system testing, user training and documentation. The first major effort will be the successful implementation of a Alumni/Development records system. A minimum of 3-5 years of data processing experience, a B.S. degree in Computer Science or equivalent experience/training, at least two years in COBOL experience and excellent oral and written communication skills. Highly desirable attributes include: data base experience with TOTAL, on-line application experience, knowledge of MARK-IV, large mainframe (360/370) experience and higher education system in the Financial and Alumni Records applications. We offer an excellent salary and a liberal fringe benefit package. If you're interested send a resume including salary history and requirements in confidence to: Manager of Recruitment, RPI, Pittsburgh Building, Troy, NY 12181.

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Scientific Programmer

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Position involves working the design, programming, and implementation of real-time data acquisition software and data reduction software on a minicomputer. Additionally it may require some scientific programming in FORTRAN on a COC 6400. Applicant should have a BS in Computer Science, engineering, or the physical sciences in addition to at least three years hands-on experience with any minicomputer. Extensive knowledge of assembly language programming a must. Ability to work independently and to thoroughly document your work is required. Salary in range $14-25K, with liberal fringe benefits. Send resume including salary history and requriements to Personnel, Kitt Peak National Observatory, P.O. Box 26732, Tucson, AZ 85726.

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SYSTEMS PROGRAMMER
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Leading educational institution seeks Systems Programmer for its professional staff. Duties will include first level maintenance responsibility of the IBM 360 MFT Operating System and developmental programming on both the IBM 360 and OECsystem10 computing systems. Applicants should have a bachelor's degree (or equivalent work experience), experience with assembler programming on the IBM 360 and OECsystem10, experience in maintaining OS and HASP, work experience with FORTRAN, and skill in the area of documentation. The appointment which will begin on or about January 15, 1978 will be one-year fixed term and may be renewable. Starting salary is $14,000 to $17,000.

Send resume by December 25, 1978 to:

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To 36K—Florida

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We are consultants to management. For immediate and confidential consideration, please send resume and salary history to: **Gary R. Schultz, One Maritime Plaza—Suite 1350, San Francisco, California 94111. (415) 956-7120.** Employer assumes fee.

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Systems Programmer

Battelle, one of the world leaders in research and development, has an immediate opening for a Systems Programmer who is looking for a broad range of opportunities. Experience in CDC, OEC, or large-scale IBM systems is preferred. You should possess excellent technical and communication skills.

The Battelle Computer Center supplies computing resources to support a large variety of research, development, and educational activities. We provide telecommunications capabilities on a worldwide basis, linked to two large CDC computers and a VAX 11/780. You will have the opportunity to participate directly in many interesting research and development projects involving computer technology. Salary will vary from $18,000 to $26,500 commensurate with experience and capabilitiy. Send resume in confidence to:

Dick Shaw, Personnel Advisor

Battelle Columbus Laboratories
505 King Avenue
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The Wharton School of the University of Pennsylvania is seeking an individual to manage its computer center. The individual will be responsible for:

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teaching and administering an introductory MBA-level computer course

The individual should have experience in managing a service organization and have solid understanding of the principles of interactive computer operation and hardware. Knowledge of several major computer languages is essential, preferably APL, FORTRAN and/or COBOL. Specific experience with DEC-10 computers is desirable. Applicants should possess an MBA, or other advanced degree, or comparable job experience.

Resumes and related material should be sent to:

Director Search Committee
Wharton Computer Center
The Wharton School
University of Pennsylvania
E-108 Dietrich Hall CC
Philadelphia, PA 19104
Attn. Mrs. Jacqueline M. Schreyer

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3-5 yrs exp w/ good DB/DC bkg'd. Heavy user interface $21K to $25K.

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Mark Fuller

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INST. OF DATA PROCESSING

Applicants must hold a bachelor's degree, master's preferred; be able to provide evidence of teaching ability and have at least two years experience in COBOL with exposure to Assembler and/or RPG. FORTRAN also helpful as well as some experience in systems development. Academic year contract. Full-time beginning January 16, 1979. Salary commensurate with education and experience. Application deadline — postmarked no later than December 15, 1978.

Send resume and credentials to: Personnel Office, Parkland College, 2400 W. Bradley Avenue, Champaign, IL 61820.

AA/EEO Sec. 504 Employer

SENIOR PROGRAMMER ANALYST

City of Garden Grove, Orange County, California. 1366-1664 per month, excellent fringe benefits. Plans, develops and modifies complex programs and systems to be processed by the City's Micro-Data Reality System. Apply at **11391 Acacia Pkwy., Garden Grove, Ca. 92640. Or call (714) 638-6763.** E.O.E.

TELECOMMUNICATIONS ANALYST

Major data processor for credit unions has an opening for a Telecommunications Analyst. This position involves financial administration, analysis and optimization of lease line networks and terminal equipment. 2-5 years experience is required and a degree is desirable but not necessary. Salary will be commensurate with experience.

Send resume including salary history and requirements to: **Personnel Officer, CUNADATA Corporation, 6902 Odana Road, Madison, Wisconsin 53719.**

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COMPUTER PERSONNEL

Sedgwick County has installed an IBM 370/178 computer system and are in the process of staffing qualified computer personnel in the area of OS/VS1, CICS, DL1, COBOL and a number of applications such as Accounting, Payroll, Personnel, and Justice Information Systems.

Any persons interested in participating in the development of this new computer center should send resumes with salary requirements, or contact the following:

Ted E. Jones,
Director of Data Processing
510 North Main
Wichita, Kansas 67203
Phone: 316-268-7968
or
Michael A. Mueller
Sedgwick County Personnel
510 North Main
Wichita, Kansas 67203
Phone: 316-268-7178

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SYSTEMS ANALYST
COMPUTER PROGRAMMER
COMPUTER PROG/ANALYST

FOR THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Experience needed in system design, documentation and programming for on-line administrative systems. Skill in structured system design, modular COBOL programming, OS/VS JCL, IMS DB/DC and PANVALET preferred.

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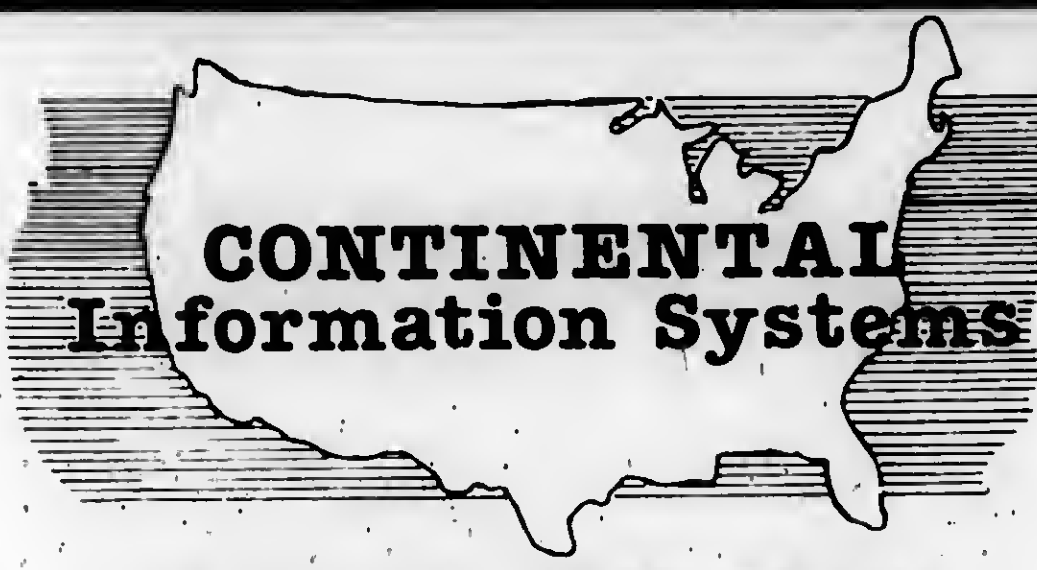

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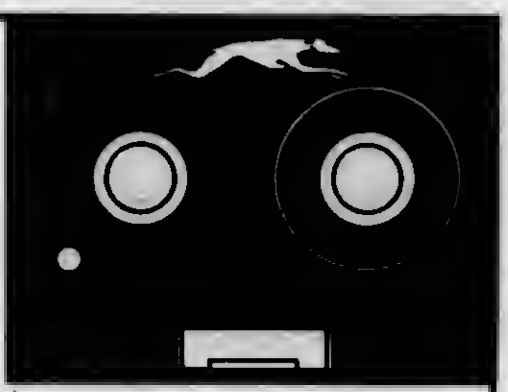

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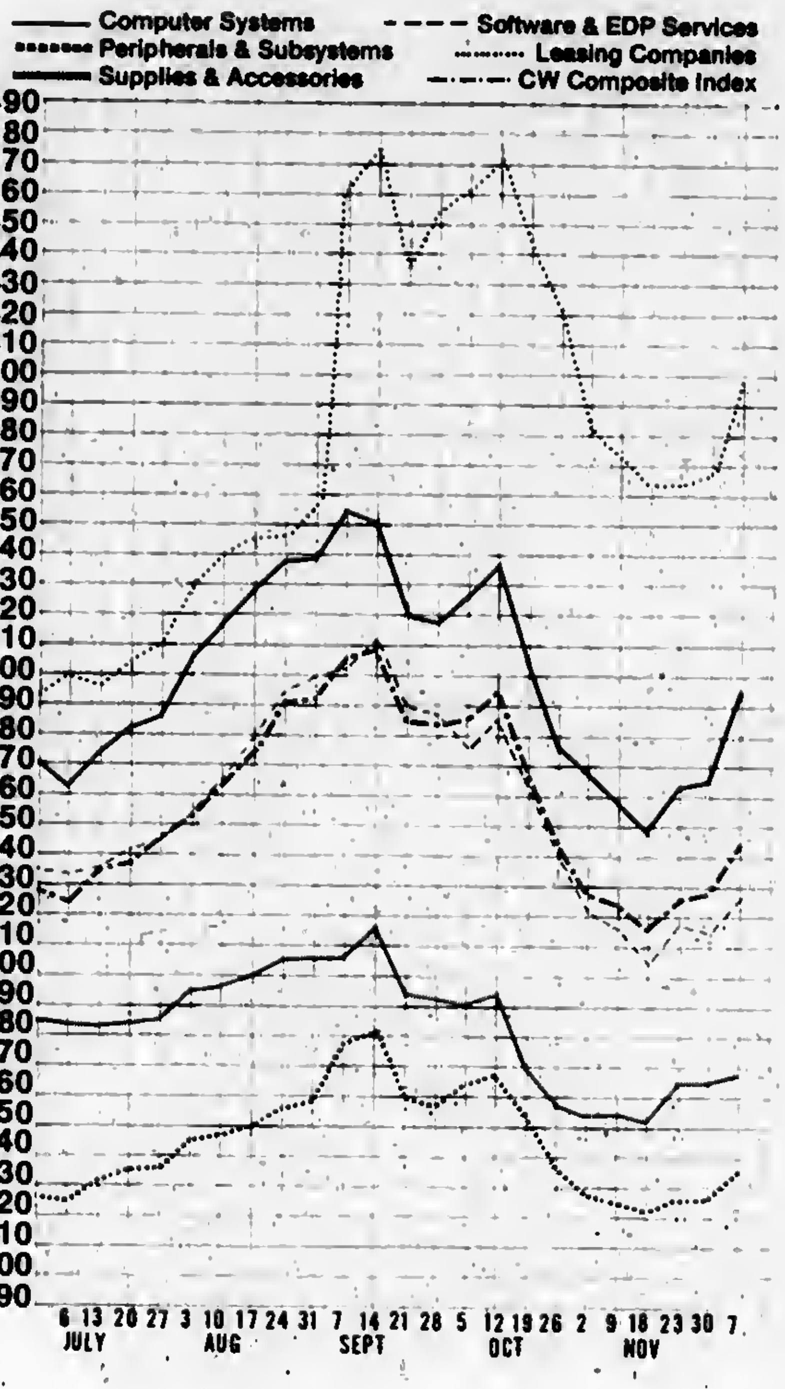

Earnings Reports

ALPEX COMPUTER
Three Months Ended Sept. 30

	1978	1977
Lose	$141,032	$20,789
9 Mo Spec		
Cred	e159,000	.....
Loss	187,721	115,393

a-From settlement of a lawsuit.

CENTRONICS DATA COMPUTER
Three Monthe Ended Sept. 30

	1978	1977
Shr Ernd	$.36	$.53
Revenue	21,644,695	15,825,966
Earnings	2,129,971	3,083,006

COMPUTER INVESTORS GROUP
Three Months Endad Sept. 30

	1978	1977
Shr Ernd	$.39	.....
Revenue	7,043,000	$7,732,000
Tax Cred	90,000	.....
Loss	153,000	129,000
6 Mo Shr	.39	.....
Revenue	15,126,000	14,176,000
Earnings	854,000	(573,000)

DATA DIMENSIONS
Three Months Ended Sept. 30

	1978	1977
Shr Ernd	$.29	$.21
Revenue	4,388,000	$2,968,000
Earnings	231,000	181,000
9 Mo Shr	.70	.42
Revenue	11,609,000	7,867,000
Tax Cred	259,000	.....
Earnings	550,000	320,000

INFORMATION INTERNATIONAL
Three Months Ended Oct. 31

	1978	1977
Shr Ernd	$.13	$.16
Revenue	3,622,103	3,403,345
Earnings	328,749	423,104
6 Mo Shr	.27	.23
Revenue	7,283,322	5,897,228
Earnings	707,335	606,975

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 6, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

E X C H		PRICE			
		1978 RANGE †††	CLOSE DEC 6 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	51 3/4	+5 3/4	+12.5
N	BURROUGHS CORP.	59- 87	73 1/2	+4 3/8	+6.3
O	COMPUTER AUTOMATION	15- 44	20 1/4	+2 1/2	+14.0
N	CONTROL DATA CORP	23- 44	35 3/8	+4 1/8	+13.1
O	CRAY RESEARCH INC	8- 30	28	+2	+7.6
N	DATA GENERAL CORP	42- 71	61 7/8	+3 7/8	+6.6
N	DATAPOINT CORP	34- 75	66	+6 7/8	+11.6
N	DIGITAL EQUIPMENT	39- 54	50 5/8	+3 3/8	+7.1
N	ELECTRONIC ASSOC.	2- 13	7 1/4	+ 3/4	+11.5
A	ELECTRONIC ENGINEER.	9- 19	12 1/4	+1	+8.8
N	FOUR-PHASE SYSTEMS	19- 46	31 1/4	+4	+14.6
N	FOXBORO	28- 40	31 1/8	- 7/8	-2.7
O	GENERAL AUTOMATION	7- 26	17 3/8	+3 7/8	+28.7
O	GRI COMPUTER CORP	1- 3	1 1/4	0	0.0
N	HEWLETT-PACKARD CO	62- 93	87 5/8	+5 3/8	+6.5
N	HONEYWELL INC	43- 72	68 3/4	+4 7/8	+7.6
N	IBM	236-305	278	+12 1/2	+4.7
O	MANAGEMENT ASSIST	9- 29	18 7/8	+2 3/4	+17.0
O	MANUFACTURING DATA S	9- 23	20 3/4	+2 1/8	+11.4
O	MICRODATA CORP	10- 23	18 7/8	+1 5/8	+9.4
O	MINI-COMPUTER SYST	4- 8	6 1/4	+1	+19.0
O	MODULAR COMPUTER SYS	7- 17	10 1/4	+1 1/8	+12.3
N	NCR	37- 67	62 1/2	+4 3/4	+8.2
N	PRIME COMPUTER INC	20- 43	30 3/4	+4 1/8	+15.4
N	PERKIN-ELMER	17- 28	27 5/8	+3	+12.1
N	SPERRY RAND	33- 49	44	+3 1/8	+7.6
A	SYSTEMS ENG. LABS	11- 24	14 5/8	+2	+15.8
O	TANDEM COMPUTERS INC	13- 37	25 1/2	+ 1/2	+2.0
A	WANG LABS.	12- 32	29	+5 3/4	+24.7

LEASING COMPANIES

E X C H		PRICE			
		1978 RANGE †††	CLOSE DEC 6 1978	WEEK NET CHNGE	WEEK PCT CHNGE
P	BORTHE COURIER CORP	13- 21	21 3/4	+3 1/4	+17.5
O	COMDISCO INC	5- 22	15	+1 1/2	+11.1
A	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	3	+ 1/8	+4.3
O	CONTINENTAL INFO SYS	5- 15	7 1/2	+1 1/4	+20.0
M	DATRONIC RENTAL	1- 3	2	0	0.0
A	DCL INC	3- 5	4 3/8	+ 7/8	+25.0
N	DPF INC	8- 14	10 3/4	+1 1/4	+13.1
N	ITEL	16- 36	26	+3 1/8	+13.6
N	LEASCO CORP	24- 36	36	+2 3/4	+8.2
O	LEASPAC CORP	1- 4	3 1/8	- 1/8	-3.8
A	PIONEER TEX CORP	3- 7	3 1/8	- 1/4	-7.4
N	U.S. LEASING	13- 20	15 1/2	+ 1/2	+3.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
††† TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

E X C H		PRICE			
		1978 RANGE †††	CLOSE DEC 6 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/8	+ 1/4	+28.5
O	ANACOMP INC	8- 22	11 3/4	0	0.0
A	APPLIED DATA RES.	8- 17	11 1/8	+1 1/8	+11.2
N	AUTOMATIC DATA PROC	24- 36	31 3/4	+2 3/4	+9.4
O	COLEMAN AMERICAN COS	1- 2	5/8	- 1/8	-16.6
O	COMPU-SERV NETWORK	6- 12	5 3/4	- 1/4	-4.1
O	COMPUTER HORIZONS	1- 9	5 3/4	0	0.0
O	COMPUTER NETWORK	6- 16	6 7/8	+ 1/2	+7.8
N	COMPUTER SCIENCES	8- 17	12 7/8	+1	+8.4
O	COMPUTER TASK GROUP	1- 4	4 1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 1/4	+ 1/8	+5.8
O	COMPUT AUTO REP SVC.	4- 10	5 7/8	0	0.0
O	COMSHARE	6- 19	15 1/4	+1 3/4	+12.9
O	CULLINANE CORP	14- 33	19	+2	+11.7
O	DATA DIMENSIONS INC	4- 9	5 5/8	+ 3/4	+15.3
O	DATATAB	1- 2	7/8	0	0.0
N	ELECTRONIC DATA SYS.	15- 25	19 3/4	+2 5/8	+15.3
O	INSYTE CORP	1- 3	1	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 1/2	0	0.0
O	KEYDATA CORP	1- 3	1 3/4	- 1/4	-12.5
A	LOGICON	10- 19	11 5/8	+ 3/4	+6.8
A	NATIONAL CSS INC	15- 36	26 1/2	+3 1/8	+13.3
O	NATIONAL DATA CORP	7- 13	9	+ 5/8	+7.4
A	ON LINE SYSTEMS INC	12- 30	17 1/4	+1	+6.1
N	PLANNING RESEARCH	4- 10	7	+1	+16.6
O	PROGRAMMING & SYS	1- 1	1 1/2	0	0.0
O	RAPIDATA INC	3- 7	4 3/8	+ 3/8	+9.3
O	REYNOLDS & REYNOLDS	18- 36	29	- 1/4	-0.8
O	SCIENTIFIC COMPUTERS	3- 9	6 1/8	+ 1/4	+4.2
O	TYMSHARE INC	18- 33	26 3/8	+1 1/2	+6.0
A	URS SYSTEMS	5- 8	6 1/2	+ 3/8	+6.1
N	WYLY CORP	1- 7	4	+ 1/4	+6.6

PERIPHERALS & SUBSYSTEMS

E X C H		PRICE			
		1978 RANGE †††	CLOSE DEC 6 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	24 1/2	+2 3/8	+10.7
O	ADVANCED MEMORY SYS	7- 18	13 7/8	+1 1/8	+8.8
N	AMPEX CORP	10- 19	15 5/8	+1 1/4	+8.6
O	ANDERSON JACOBSON	5- 10	6 1/4	+ 5/8	+11.1
N	APPLIED DIG DATA SYS	9- 22	10 3/8	+ 1/4	+2.4
O	BEEHIVE INT'L	3- 7	3 3/4	+ 3/8	+11.1
A	BOLT, BERANEK & NEW	6- 14	10 3/4	+1	+10.2
N	BUNKER-RAMO	10- 20	14 5/8	+ 5/8	+4.4
A	CALCOMP	3- 13	6 5/8	+ 3/8	+6.0
O	CAMBRIDGE MEMORIES	3- 9	4 3/8	+ 1/8	+2.9
N	CENTRONICS DATA COMP	16- 37	24	+ 1/8	+0.5
O	COGNITRONICS	1- 4	2	+ 1/4	+14.2
O	COMPUTER COMMUN.	6- 12	5 1/8	+ 3/4	+17.1
O	COMPUTER CONSOLES	4- 10	8 1/4	+ 3/4	+10.0
A	COMPUTER EQUIPMENT	3- 6	3 7/8	- 1/8	-3.1
C	COMPUTER TRANSCEIVER	1- 3	4 1/4	+1 1/4	+41.6
O	COMPUTERVISION CORP	9- 30	21	+ 3/4	+3.7
O	COMTEN	9- 38	14 1/2	+2	+16.0
N	CONRAC CORP	13- 26	15 1/2	+ 1/4	+1.6

E X C H		PRICE			
		1978 RANGE †††	CLOSE DEC 6 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	3- 14	11	- 3/4	-6.3
O	DATA 100	9- 20	19 3/4	0	0.0
A	DATA PRODUCTS CORP	14- 25	18	+2 3/8	+15.1
O	DATUM INC	2- 6	2 5/8	+ 1/8	+5.0
O	DECISION DATA COMPUT	2- 6	3 1/8	+ 1/8	+4.1
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
A	DOCUMATION INC	6- 34	22 3/4	+3 3/8	+17.4
O	DATARAM CORP	6- 32	19 1/2	-2	-9.3
N	ELECTRONIC M & M	4- 9	4 7/8	+ 1/2	+11.4
O	FABRI-TEK	1- 2	1	-	-5.9
O	GENERAL COMPUTER SYS	1- 3	1 3/4	0	0.0
O	GENERAL DATACOMM IND	9- 21	12 3/4	+ 3/4	+6.2
N	HAZELTINE CORP	10- 17	12	+1 1/8	+10.3
N	HARRIS CORP	17- 36	32 1/2	+3 1/8	+10.6
O	INFOREX INC	6- 11	7 3/8	+ 7/8	+13.4
O	INFORMATION INTL INC	7- 12	7 1/4	0	0.0
O	INFOTON	1- 3	2 5/8	+ 1/4	+10.5
O	INTEL CORP	39- 62	52 1/2	+4 1/2	+9.3
A	LUNDY ELECTRONICS	4- 8	4 1/4	- 3/8	-8.1
O	MSI DATA CORP	10- 19	10 3/4	- 3/8	-3.3
N	MEMOREX	27- 59	31 1/4	+2 1/2	+8.6
N	MOHAWK DATA SCI	6- 15	9 7/8	+1 1/4	+14.4
O	OMEX	2- 6	5 1/2	0	0.0
O	PARADYNE CORP	9- 17	9 1/8	+ 3/8	+4.2
O	PENRIL CORP	5- 12	9 1/4	+ 1/2	+5.7
N	PERTEC CORP	9- 17	12 1/4	+1 5/8	+15.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	8 1/8	+ 1/2	+6.5
O	SCAN DATA	1- 5	2	+ 1/8	+10.3
N	STORAGE TECHNOLOGY	19- 46	30 7/8	+4 5/8	+17.6
O	T BAR INC	11- 20	14 1/2	+ 1/2	+3.5
O	TALLY CORP.	4- 14	13 3/4	+5 1/8	+59.4
A	TEC INC	6- 13	6 3/8	+ 1/4	+4.0
N	TEKTRONIX INC	33- 50	47 3/4	+4 3/4	+11.0
N	TELEX	3- 9	5 1/4	+ 1/8	+2.4
O	TESDATA SYSTEMS CP	9- 23	9 1/2	+ 1/4	+2.7
O	WILTEK INC	1- 2	1	0	0.0

SUPPLIES & ACCESSORIES

E X C H		PRICE			
		1978 RANGE †††	CLOSE DEC 6 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	7 7/8	+ 1/4	+3.2
O	BALTIMORE BUS FORMS	2- 4	1 1/2	0	0.0
A	BARRY WRIGHT	14- 30	25 3/4	+2	+8.4
O	CYBERMATICS INC	1- 1	1/2	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	17	+ 3/8	+2.2
N	ENNIS BUS. FORMS	8- 17	11 5/8	0	0.0
N	3M COMPANY	43- 66	61 1/2	+2	+3.3
O	MOORE CORP LTD	26- 34	28 1/4	0	0.0
N	NASHUA CORP	18- 37	25 1/2	+2 3/8	+10.2
O	STANDARD REGISTER	20- 27	23 3/4	+1	+4.3
A	TAB PRODUCTS CO	8- 16	10	- 1/4	-2.4
N	WAPIO	19- 47	47 1/4	+1	+2.1
A	WABASH MAGNETICS	10- 22	15 1/4	+ 1/4	+1.6
N	WALLACE BUS FORMS	18- 33	24	+1 3/4	+7.8

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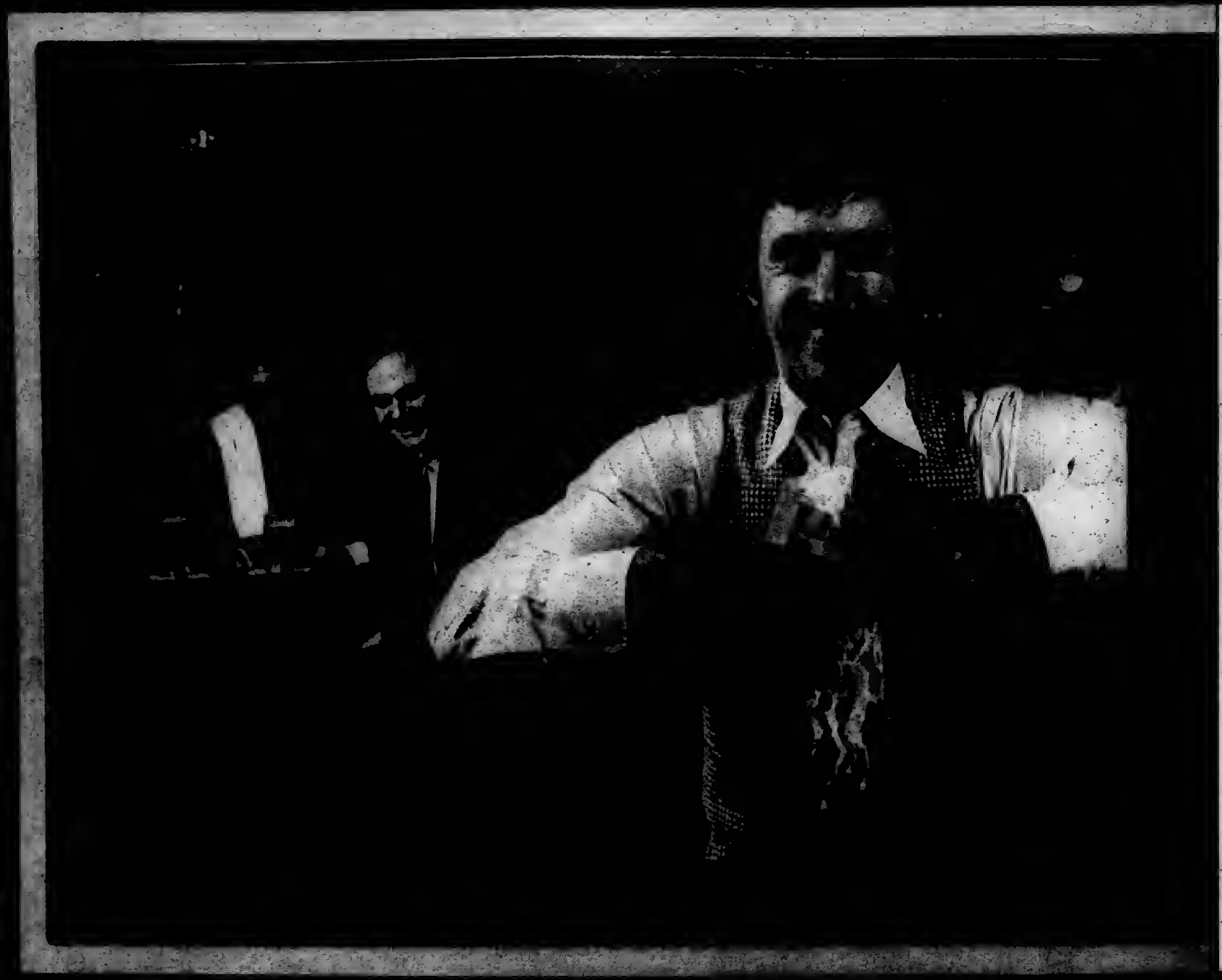

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SEASON'S GREETINGS

CW Photo by J. Woodruff

Shoppers crowd around micros for gift suggestions.

Users Give 30 Packages Place on '78 Honor Roll

By Don Leavitt
CW Staff

DELRAN, N.J. – Thirty packages earned places on the 1978 Software Honor Roll, and nearly a dozen of them deserve special recognition because they have satisfied the requirements for the Honor Roll for at least four consecutive years, according to Datapro Research Corp.

The Honor Roll is made up of those packages that received weighted average ratings of 3.5 or higher in overall satisfaction and 2.8 or better on various specific attributes from 10 or more users in a nationwide survey conducted by Datapro.

Five of the packages have been on the annual honors list ever since Datapro started tallying user ratings six years ago. These include the Alltax tax calculation package from Management Science America, Inc.; The Disk Utility System from Westinghouse, Epat, a tape librarian from SDI; The Librarian from Applied Data Research, Inc. (ADR); and Panvalet, another source library support system, from Pansophic Systems, Inc.

The Fast Dump/Restore (FDR) disk utility from Innovation Data Processing, Inc. and Syncsort from Whitlow Computer Systems, Inc. are five-time Honor Roll members while two other packages – 1130 Fortran from DNA Systems, Inc. and the Westi teleprocessing monitor from Westinghouse – are on the honors list for the fourth year in a row.

(Continued on Page 8)

1978 SOFTWARE HONOR ROLL

Adabas (2)
Software AG of North America, Inc.
Alltax (6)
Management Science Americe, Inc.
Basic Editor Monitor
Univac
CA-Sort (3)
Computer Associates, Inc.
Disk Utility System (6)
Westinghouse Electric Corp.
Display Operator Console Support (Docs)
CFS, Inc.
DOS/MVT
Software Pursuits, Inc.
DYL-260 (3)
Dylakor Software Systems, Inc.
Easytrieve (3)
Pansophic Systems, Inc.
Extended DOS (Edos) (2)
The Computer Software Co.
Epat (6)
SDI
Fast Queuing System (Feqs)
Goal Systems
Fast Dump/Restore (FDR) (5)
Innovation Deta Processing, Inc.
Flee/Flim (2)
Goel Systems
1130 Fortran (4)
DNA Systems, Inc.
IDMS (3)
Cullinane Corp.
Imege/3000
Hewlett-Peckard Co.
The Librerien (6)
Applied Data Research, Inc.
Panvalet (6)
Pensophic Systems, Inc.
Quikjob (2)
Systems Support Software, Inc.
Roscoe (2)
Applied Date Reseerch, Inc.
RPG-II — System/3 (2)
IBM Gonerel Systems Division
RPG (360/370)
IBM Data Processing Division
Statisticel Analysis System (SAS) (3)
SAS Instituto, Inc.
Shedow II
Altergo, Inc.
Slick (3)
NCI, Inc
Sort — System/3 (2)
IBM Genorel Systems Division
1130 Sort
DNA Systems, inc.
Syncsort (5)
Whitlow Computer Systems, Inc.
Westi (4)
Westinghouse Eleclric Corp.

The figures in parentheses indicate the number of consecutive years each package has achieved Honor Roll status.

DP's Present to Shoppers: The Automated Gift List

By Jay Woodruff
CW Staff

MANCHESTER, N.H. — Pre-Christmas Friday evenings at the Mall of New Hampshire here aren't very different from those at other shopping centers — the parking lots are jammed and shoppers storm the stores while trying to decide what to buy for whom.

A unique service at the Digital Store, however, promises to improve shoppers' attitudes about the "joys" of Christmas gift giving. The service? An automated Christmas gift list, compiled by the other stores at the mall.

Shortly after Thanksgiving, Digital Equipment Corp. set up three floppy disk-based WT/78 word processors and LA35 printers just outside its store, which is situated inconspicuously among shoe shops, department stores and furniture outlets. The microcomputers were filled with approximately 1,400 gift suggestions categorized by age group, sex, price range and gift types, from clothes to small appliances.

Each machine is programmed so a shopper can key in the four criteria; and the printer generates, on a special form, a list with up to 20 gift suggestions, each with a price and the name of the store that carries the product. On one recent Friday evening shoppers formed long lines around the display waiting to get their lists.

"We're really happy with the reaction to the list," Ray DeFelice, the Digital Store's assistant manager, said. "We've had merchants stop by to tell us how customers have come into their store with the lists, saying 'I want to see your $9.95 blouses' and then buy the item without hesitation."

To reduce the drain on those items already on the list and to take advantage of user response, the store has increased the number of gifts on the list.

What did the Digital Store expect to gain from dispensing free gift suggestions from every store but its own? While a microcomputer for $9,950 may not be everyone's idea of a stocking stuffer, DEC thinks exposure to computers during the Christmas season will reduce any fears the public may have about them, according to

(Continued on Page 4)

Carter Praises U.S. Projects Aimed at Fraud Detection

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — President Carter and top Administration officials, pledging greater efforts to reduce crimes involving government programs, last week praised the computer matching techniques used by the Department of Health, Education and Welfare (HEW) to detect fraud against the government.

The occasion was the two-day Secretary's Conference on Fraud, Abuse and Error, convened here last week by HEW Secretary Joseph A. Califano Jr., Attorney General Griffin Bell and Elmer B. Staats, Comptroller General of the U.S., joined Carter and Califano in promising increased and more effective use of computer technology in reducing the estimated $7 billion lost every year through fraud and mismanagement in government programs.

Saying "this Administration has declared war on waste and fraud in government programs," Carter lauded the success of three HEW programs — Project Match, Project Integrity and Project Cross-Check — that use computers to detect cheaters in government welfare, health insurance and student loan programs respectively [CW, Oct 16].

"Project Match is sifting out those on the federal payroll who are illegally receiving welfare benefits," the President said. "The project is very new, but it has already repaid its $1 million cost

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Pfeiffer Describes IBM's Efforts to Treat Company's Image Problems in Early '70s

By Connie Winkler
CW Staff

NEW YORK — When IBM had image problems in the early 1970s, it called in its superwoman, Jane Cahill Pfeiffer.

Jane Cahill Pfeiffer

IBM mounted an aggressive public relations campaign beginning in 1972 in response to new concerns including antitrust charges, Pfeiffer testified in the U.S. vs. IBM antitrust trial here last week. She had been named IBM corporate director of communications in 1971 and became corporate vice-president of communications in 1972. Before that, she was secretary to the top IBM management committee and an executive assistant to IBM Chairman Thomas J. Watson Jr.

One of only two woman vice-presidents in the history of IBM, Pfeiffer was named to the RCA Corp. board of directors and appointed chairman of NBC this October.

The first woman witness in this landmark trial, Pfeiffer praised IBM's efforts to bring women and minorities into the corporation and promote them to the pool of potential vice-presidents — despite the fact there have been no women or black vice-presidents since she left.

"I wanted the public to know what a fine company IBM was through its products, people and services," Pfeiffer, who joined IBM in 1955, said. "We really had not done enough communicating of what we were all about in terms of our products and our people, and we sought to do that."

The new image effort focused on quality television sponsorship — more noticeable because of the scarcity of commercials during the shows — and more open relations with the press, she said. IBM sponsored TV shows such as "Leonardo da Vinci" and "Sleeping Beauty" which reached an estimated 52 million viewers in 1972 and 1973.

The new public relations stance, as opposed to the responsive one the company had carried out until then, was in answer to a variety of big concerns facing IBM, Pfeiffer explained.

Besides the concern over antitrust charges and the image of being too big, she listed trade and tax issues in Washington; the power of multinational corporations and how that power is perceived overseas; privacy and data accuracy issues involving the computer; and concerns for the economy, domestic jobs and worker alienation.

To carry out her program, Pfeiffer increased the corporate communications budget from $9.8 million in 1972 to $17.5 million in 1973, with about $6 million of that going into television.

"We felt probably for the first time that the future would have the public more involved in IBM equipment," she said about the move to mass audience programming.

On redirect examination by lead IBM counsel Thomas D. Barr, Pfeiffer noted that even the amount of money IBM spent on TV ads and programming did not rank it in the top 100 companies doing TV advertising.

Beginning in 1972, IBM also started putting its messages across to employees primarily through internal publications such as *Think* magazine, Pfeiffer said. IBM also started returning phone calls from the press, which it previously had brushed off with "no comment." IBM communications also arranged luncheons and seminars between top IBM executives and editors of leading national publications.

Internal Memos

Pfeiffer's day on the stand was peppered with interesting internal IBM memos which government lawyer Joseph Tobacco sought to introduce. In one such memo of which Pfeiffer received a copy, then IBM Chairman T.V. Learson sought to slow down IBM salesmen in their dealings at *Forbes* magazine. The overselling was inappropriate at a "magazine that can do so much to affect the future of our personnel and the value of our stock," it said.

Tobacco tried to show that IBM was successful in placing stories favorable to IBM in the media. Pfeiffer, however, strongly rejected that notion, stating that IBM did not manage to manipulate the press.

Although she believes IBM's weaknesses are in the area of corporate social responsibility, she defended the firm's efforts to bring women and minorities into meaningful jobs.

"Would you point to IBM's track record in the number of corporate vice-presidents who have been women (two out of about 125) as an example of IBM's dignity for the individual rights of women?" Tobacco asked.

"The fact there have been one or two women along the line indicates an openness that is ahead of most in our country," Pfeiffer answered.

Pfeiffer attributed her own success at IBM to the number and variety of jobs she held. Starting as a systems service representative, she went on to manage

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Scrooge

Think what might have happened if old Ebenezer had been a sort user!

Call (201) 568-9700.

Stamp out ghastly sort performance.

Scene: The MVS computer center of Scrooge & Marley, a busy counting-house. Enter Bob Cratchit, systems programmer and father of a large family.

Cratchit: Excuse me, sir. I was wondering if I might have December 25th off.

Scrooge: Bah, humbug, Cratchit! You know we have all those sorts to run by the end of the year. And nobody to run 'em but that green kid you hired. What's his name?

Cratchit: Tiny Tim, sir. (Bravely) He's my son and he says it's our sort program that's causing the trouble. He thinks we ought to try SyncSort—

Scrooge: Humbug, man! Our sort is made by the World's Leading Hardware Manufacturer. (Jams on his hat.) Now be here all the earlier on the 26th!

Scrooge takes a solitary meal at his local fast-food outlet and then retires to his gloomy bedchamber. Perhaps as a result of what he has eaten—a tacoburger washed down by a low-calorie soda—he experiences a harrowing nightmare.

He is visited not only by the ghost of his former partner, Jacob "Free Software" Marley, but also by the Ghosts of Data Processing Past, Present and Future.

Ghost of DP Present (as he shows Scrooge the Cratchit family gathered for their holiday meal): Yes, a happy family, but—alas—one over whom a cloud hangs. Poor Tiny Tim . . .

Scrooge: Is there no hope for the little chap, Spirit?

Ghost: No . . . unless Tiny Tim receives a new sort program, his operations are . . . doomed!

When Scrooge finally awakens from his ordeal, he is a greatly changed man. Happy to be alive, he springs from his bed, throws open his windows and calls to a blue-jeaned youth in the street below.

Scrooge: You there, boy! Do y'know the fine, big sort program that hangs in the shop down the street?

Boy: Crikey, sir, you must mean SyncSort.

Scrooge: I do indeed. Run and tell 'em to send it here at once! A half crown if it arrives in less than five miuntes. (Chortling) I'll send it along to Tiny Tim. If that doesn't goose up his sorting, nothing will.

From that day to this, no man keeps the holidays better than Scrooge, and nobody sorts better either. To Tiny Tim, who has just received his MBA, Scrooge has been a second father.

And to his other employees, who now enjoy ten paid holidays a year, Scrooge is as good a man and as good a master as anyone in the good old world of data processing!

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Lessor Levels Antitrust Charges

Transamerica vs. IBM Opens on West Coast

By Marcy Rosenberg
CW Staff

SAN FRANCISCO — For the sixth time in about eight years, IBM is slugging it out in a courtroom battle to defend its heavyweight title against antitrust charges. This time the charges have been leveled by Transamerica Computer Co., a computer leasing firm.

Transamerica filed suit against IBM in October 1973, charging predatory and monopolistic business practices. While these allegations have a similar ring to those brought in the past by Memorex Corp., Telex Corp., California Computer Products, Inc. Greyhound Computer Corp. and the federal government, this latest jury trial got off on different footing.

For one thing, attorneys for both sides agreed before the trial began in U.S. federal district court here to accept a court verdict if the 14-member jury should reach a deadlock — a lesson learned from the Memorex case — or if the number of jurors dwindles to fewer than six, the constitutional limit.

Also prior to the trial, Judge Robert H. Schnacke granted an IBM motion to strike prejudgment interest from Transamerica's damage claims, thereby reducing damages from $105 million to between $63 million and $90 million.

Of that total, the leasing company is asking between $33 million and $38 million for lost revenues on equipment it actually owned. Transamerica also seeks another $30 million to $52 million for future profits never realized because IBM's actions interfered with its business, according to Transamerica attorney Richard J. Lucas of Orrick, Herrington, Rowley & Sutcliffe here.

Three Markets

Transamerica charged that from 1964 to 1973 IBM monopolized three relevant markets — general-purpose computer systems; plug-compatible disk drives and controllers; and plug-compatible tape drives and controllers.

"The evidence will show that when emerging competition began to face IBM . . . IBM took . . . quick and harsh action to stifle that competition," Lucas said in his opening statement to the jury. "We think it is no overstatement to say that this case is about corporate greed, IBM's corporate greed."

Transamerica also intends to prove IBM nurtured a market for computer leasing — rather than encourage outright purchase — to foster customer dependence on IBM and to make the computer market capital-intensive and difficult to enter. "We will show that . . . IBM wanted the lease market because it would place the greatest financial strain on [its] competition," the Transamerica attorney stated.

Further, Lucas said he would show IBM carried out a number of "anti-competitive, predatory" acts to block a growing competition from plug-compatible manufacturers (PCM) and from companies like Transamerica that purchase general-purpose computer systems and peripheral equipment manufactured by PCMs and lease these to end users.

Some of these acts were manipulations of products like the Model 2314 disk drive used on IBM 360s. Transamerica alleges that because of a growing number of competing plug-compatible 2314s, IBM announced in May 1970 the Model 2319A disk drive for its then-new 370 series of computers. The 2319A, Lucas charged, was the same as the 2314, but with a different number and interface so PCMs could not readily attach their drives.

Lucas made similar claims about other disk and tape drives IBM introduced later.

In addition, Transamerica is charging IBM with discriminatory price cutting — and in some cases, pricing below cost — through such tactics as its Fixed Term Plan (FTP) and Extended Term Plan (ETP). These plans provided extended lease terms with discounts for certain product categories, many of which competed with PCM products.

The FTP was "not just a price cut and not just a discriminatory price cut. FTP locked out . . . the PCMs for a one- or two-year period," Lucas told the jury.

Many of the Transamerica allegations echo those made most recently by Memorex in its antitrust action early this year [CW, Jan. 30], an action that ended in a 9-2 jury deadlock in favor of Memorex [CW, July 10].

IBM's Defense

As in many previous cases, IBM claimed its alleged product manipulations were technological advances to benefit the consumer and that these advances, along with its reduced prices, were evidence of a competitive climate and not countercompetitive.

The firm also claimed that in this case, Transamerica lost money not because of IBM, but because of poor management and failure to keep pace with rapidly changing technology. "The reason . . . that Transamerica Computer Co. failed was that it was not an efficient, productive, well directed company," according to IBM attorney William W. Vaughn of O'Melveny & Myers, Los Angeles.

In his opening statement, Vaughn claimed Transamerica "did not develop anything . . . it did not research anything . . . it did not manufacture anything . . . it did not service anything, market anything" and when the leasing company entered the computer business, it made "some fatal assumptions."

Transamerica "bet there would be no technological advance, prices would stay up, the investment tax credit would be there, everything would be hunky-dory, and [it] lost," Vaughn stated.

Following the opening statements, Transamerica called as its first witness Jack R. Beckett, chairman of Transamerica Corp., its parent company. Beckett testified about the formation of Transamerica Corp. and its entry into the computer market.

Beckett was on the stand in direct and cross-examination for most of last week except on Tuesday, when attorneys for both sides met with the judge in his chambers, according to Ed Rogin, one of Transamerica's attorneys, who was present during those proceedings.

At that time, Rogin said, the judge overruled an IBM objection to certain charts and some of the deposition testimony — scheduled for this week — of Transamerica's second witness, Frederick Withington of Arthur D. Little, Inc.

The judge also overturned Transamerica's objection to an IBM chart tracking Transamerica's stock prices over a 10-year period, but ordered IBM to redraw a graph of Transamerica's net income and revenue that the leasing firm claimed was misleading, Rogin added.

Beginning today, Transamerica reportedly plans to present, in deposition, excerpts of Withington's testimony at the U.S. vs. IBM trial, currently taking place in New York.

Correction

Itel Corp. issued a clarification of its pricing of add-on memory for IBM 370 and 370-compatible systems shortly after *Computerworld* went to press last week ["IBM Drops Memory Prices, Doubles Capacity of 3033," CW, Dec. 11].

"Itel's pricing on all currently marketed Advanced System [AS] models, including the AS/6 Systems, will remain unchanged. Itel will reduce the price of 1M bytes of add-on memory to $65,000 for 370 models and to $75,000 for Series 30 memory," a spokeswoman said.

The price for 1M byte of memory added to Itel Advanced Systems remains at $110,000, she added.

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Automated Gift List Offered

(Continued from Page 1)

Steve Watson, the vendor's project manager.

One woman, who had apparently never used a computer before, used Digital's system for her Christmas list. As she walked away with her suggestion list, she spotted DeFelice, smiled and told him, "I actually used it. They're not hard to use."

One of the chief reasons for opening the store, Watson said, is to reduce the apprehension people like that woman have about computers as well as to attract potential customers into the store. The automated shopping list was one way to show people what they can do with a computer.

Although the Digital Store does not expect a run on computer Christmas presents, it does have a few useful gifts. The store offers a $20 gift certificate for its Computer Discovery Classes, which meet three times for 90-minute sessions.

The classes were set up primarily to introduce small businesses to some applications for a small computer. Students get a chance to try a few programs on one of the DEC microcomputer systems.

Books such as *Introduction to Programming* and *Introduction to Minicomputer Networks*, each selling for $5, floppy disks for $7.50 and $6 nylon ribbons for DEC's Diablo printer make nice stocking stuffers.

DeFelice said the automated Christmas list has been successful in a number of ways. "I like to walk out in front of the store and watch people's reactions to the list. It's nice to see how many seem to appreciate the ideas and its fun to watch the smiles," he said.

People browse through the store, reading information displayed on be-ribboned terminals attached to systems ranging in price from $9,950 for the accounting system to $25,100 for DEC's Datasystem 310, the store's most expensive system and its only mini. Larger systems, while available through the store, are not displayed because their capabilities exceed those for which store patrons are likely to be looking, DeFelice explained.

'Association for Women in Computing' Formed

By Ann Dooley
CW Staff

WASHINGTON, D.C. — The Association for Women in Computing (AWC) has been formed here to promote communication among women in the DP industry and help further their professional development and advancement.

"The time is ripe for it," according to Anita Cochran, one of the organization's founders and an Association for Computing Machinery (ACM) council member. "Women know the rules, but men know the ropes," she commented before adding that it is time the situation changed in the industry.

Other professions have organizations for women, Cochran pointed out. She said the AWC will give women DPers a network to pool their information and experience and to share what they've learned in and about their jobs.

The idea for the organization happened all at once, she recalled. A number of women associated with ACM felt women DPers warranted an organization relating specifically to women in computing, and the organization grew from those feelings.

Formally begun on Dec. 5, the AWC has as its immediate goal the building of an efficient organizational structure. It then plans the establishment of a communication network among women DPers in order to collect statistics in relevant matters and the examination of issues and problem areas.

The AWC will publish a newsletter and plans to hold meetings at most major DP conferences in the future.

Need for Technical Education

Although the computer industry is generally considered one of the better professions for women, that is true only up to a point, according to Cochran. While there are a lot of women in programming, very few are in management, she noted.

Many women in DP are employed in data entry or in some programming jobs which, with continued technological advances, could be phased out of existence, she added.

Women are held back because most are not as well educated as men in the day-to-day aspect of a job, they often don't communicate well with their male bosses or colleagues and, while still in school, may not study math and science because of social conditioning, she said. The AWC will promote the technical education of women of all ages and encourage women to follow technical career paths, Cochran said.

The AWC will have a lot of work to do before it can achieve any of these goals, Cochran acknowledged. "First we have to learn to walk. Right now we're crawling, but soon we will be running," she said.

Cochran stressed the importance of a women's communication network so women can get to know the right people. Male professionals use this system to great advantage by knowing "the right man for the job." This kind of buddy system is important both for career advancement as well as to help women feel less alienated in their jobs.

It's easy for a woman to feel alone, and this kind of network will let her know that there are other women out there with the same problems. It will also give women the chance to bounce ideas off other women, she said.

One important handicap that most women share is a lack of experience in office gamesmanship. The AWC hopes to make women aware of some of these issues, Cochran said.

The organization sees itself as a broad-based group, open to both women and men in the computer industry. Its objectives will be educational rather than political, although Cochran said the two might overlap occasionally.

Founding AWC officers are Lorraine Duvall, president; Cochran, correspondent; Nancy Bryan, scribe; Elizabeth Adams, treasurer and Virginia Walker, newsletter editor.

Information about membership is available from Cochran at 5A137 Bell Laboratories, Murray Hill, N.J. 07974.

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More 'Stark Terror' Needed?

Bankers Seen Unaware of EFT's Vulnerability

By Brad Schultz
CW Staff

WASHINGTON, D.C. — More "stark terror" may be needed before the nation's bankers realize how vulnerable electronic funds transfer (EFT) systems are to unauthorized penetration.

So said Dan McCracken, president of the Association for Computing Machinery (ACM), at that organization's 1978 conference here recently.

Most who joined McCracken on a panel that pondered whether EFT is "moving too fast" for the people who manage such systems agreed that the recent $10.2 million theft of funds from a Security Pacific bank in California through the Federal Reserve Systems EFT network, Fedwire, illustrated the inadequacy of most financial institutions' overall EFT security.

Charges of Apathy

The session also heard charges that most bankers are too ignorant or apathetic about data encryption and other methods of communications security, although panelist Arthur Hutt — A Bowery Savings Bank vice-president — remarked, "I don't think encryption means a damn in Fedwire."

Security between nodes of an EFT network cannot prevent EFT crime if the nodes themselves are vulnerable to abuse, Hutt explained.

The Security Pacific episode exemplified this vulnerability, although it did not directly involve computer systems, he observed. According to police accounts, the perpetrator used a bank official's identity code to phone an order for the funds transfer, and the theft went unnoticed for eight days [CW, Nov. 13].

Site Security

The panelists seemed to agree that site security as well as communications security is a grave administrative problem for banks participating in EFT networks.

McCracken remarked that "some folks don't understand the ball game," indicating many bankers fail to appreciate that EFT can provide unparalleled opportunities for large dollar thefts while speeding funds transfer operations.

The federal government has failed to provide bankers with adequate guidelines and advice on EFT security, McCracken suggested. Set up to provide this service, the National Commission on EFT ignored expert recommendations that DP professionals be included in its membership, he charged, indicating that the commission's findings were deficient as a result.

The ACM session heard a few "horror stories" of EFT abuse. For example, a Chicago bank reportedly mailed a customer her deposit/withdrawal card and personal identification number (PIN); both were intercepted and used to empty her $600 account and create a $1,200 overdraft.

Under the Financial Institutions Regulatory Act recently signed by President Carter, unsolicited debit cards, but not unsolicited PINs, may be mailed to bank customers, according to Pender McCarter of the American Federation of Information Processing Societies' (Afips) Washington office. The law also limits access to financial records by federal authorities and sets other privacy rules [CW, Oct. 23].

McCarter cited computer crime expert Donn Parker's testimony before the U.S. Senate that rated banking as the leading area of such abuse (20% of all computer crime), followed by the federal government (17%) and education (15%).

McCarter agreed with Parker that "the automated teller machine [ATM] is potentially the most vulnerable computer terminal" and is especially "attractive to would-be felons, including those in the Mafia."

Risks Minimized

"Bankers seem to minimize the security risks associated with ATMs," McCarter told the session. He referred to a recent American Banking Association survey of banks using ATMs which stated that most banks claimed "no security problem at all or considered their security as extremely effective" [CW, Dec. 11].

The National Commission on EFT's final report, issued last year, maintained that "few breaches" were found in EFT security, McCarter continued.

The Afips research associate called upon computing professionals to "address the problem of DP crime by offering realistic estimates of the reliability, security and accountability of present and future EFT systems."

Rational Assessment Welcome

A "rational assessment" of the federal Data Encryption Standard (DES) — which critics have called breakable — would be especially welcome, he indicated.

"Certainly such information as that provided by Frank Backman of IBM's Washington Systems Center that 'a fully integrated, large-scale, on-line EFT system is still beyond the state-of-the-art' is extremely useful for planning purposes," he said.

McCarter concluded with an outline for studying EFT issues, adapted from a proposal by Prof. Rob Kling of the University of California at Irvine:

1.1 Definitions & Relationships
1.2 Technical Issues
  1.2.1 Reliability
  1.2.2 Security
  1.2.3 Auditability
  1.2.4 Implementing EFT
1.3 Standards
1.4 Legal/Regulatory Issues
1.5 Social Issues
  1.5.1 Privacy/Confidentiality
  1.5.2 Quality of Life

Grand-Slam Combination

CRTs Team Up With Popcorn for Phillies

By Tim Scannell
CW Staff

PHILADELPHIA, Pa. — Peanuts, popcorn, computer terminals and CRT screens may seem like unusual allies to die-hard baseball fanatics, but the sales team here at Veteran's Stadium has discovered that just such a union is definitely a grand-slam combination.

The Philadelphia Phillies' ticket office has been flooded with requests for season tickets since 37-year-old switch-hitter and free agent Pete Rose agreed to join the southeastern Pennsylvania baseball club a few weeks ago. And not since Mudville's mythical Casey has so much hoopla and enthusiasm been generated by any other baseball player, according to the Phillies' director of sales, Dave Montgomery..

Jump In Sales

"We originally projected that we would sell the same number of season tickets as last year — about 15,000," Montgomery explained. "But now there are indications that sales will go as high as 18,000, which is a pretty good jump."

Season ticket orders, as well as regular one-day ticket requests, are processed by the sales staff through a Data General Corp. Nova 830 minicomputer that is linked to eight CRT terminals scattered around the ticket office. The mini performs the usual billing and mailing list duties, but it is also programmed to handle specialized seating arrangements, group sales director Richard Peats noted.

"For season ticket sales we actually make the sale on the computer," Peats pointed out. "We call up the seating diagram on the screen and it shows us what seats are sold and what seats are available."

Too Much to Handle

Before using the in-house minicomputer, ticket orders and inventory were handled in a batch mode by a local service bureau. Club officials opted for the computer system when ticket orders — which include 16 different purchase arrangements in addition to the full season plan — became too much to handle.

"Part of the reason we needed our own computer is that when we sell a seat, in essence we actually sell it five times over," Montgomery said.

With the Phillies' 81 home games to sell and general attendance tickets due to go on sale soon, Montgomery and Peats are planning to rely even more heavily on the minicomputer's speed and accuracy.

"Not only do we have 15,000 people per game here on season tickets, but we also end up dealing with about 15,000 other customers," Montgomery stated. "And as far as billing goes, that's where the computer has been such a big help to us."

Got the 1401 payroll blues?

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WANG

Contest Set Up For NCC Stamp

NEW YORK — Winners of the National Computer Conference stamp cancellation and cachet design contest will have their designs used at a temporary postal station set up at NCC '79 in the New York Coliseum June 4-7.

Contestants may submit coordinated designs for both the cachet and cancellation. Although separate prizes will be awarded, a bonus will be given for a coordinated entry if one should win.

The theme is computers and data processing, and the deadline for submission is Feb. 19.

Details are available from Ira W. Cotton, NCC '79 Philatelic Program Chairman, National Bureau of Standards, B-226 Technology Building, Washington, D.C. 20234.

BDS announces the new, economical B-300 printer from Dataproducts.

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Carter Commends Federal Matching Projects

(Continued from Page 1)

twice over."

Project Integrity "is nailing the thieves and con artists among health care providers." And, "thanks to tough management of the student financial aid program, the number of student defaulters is falling instead of rising for the first time in the history of the program, and the backlog, which hit 400,000 last March, is projected to be at zero at the end of 1980," he said.

'Expanded Attack'

Stating that "prosecution of fraud within our government is now a very high priority," Carter promised an "expanded attack on waste and fraud" to improve the functioning of the government.

Califano recounted his department's efforts to "establish the integrity of HEW's programs," an effort that includes the creation of a special inspector general's office employing 1,100 auditors, investigators and managers. That office, he said, "began sifting through the department's programs to root out fraud and abuse, vigorously using a new investigative weapon: the electronic computer."

Project Match was launched, he said, to "identify those among the 4.8 million federal civilian and military employees who might be illegally receiving welfare benefits." So far, he said, more than 18,000 cases have been turned over to state agencies for investigation.

As of last month, about half of the cases had been reviewed and 3,256 individuals found "either totally ineligible or being paid more than they were entitled to," he added.

Project Match will yield a savings of $12 million annually at a cost to the government of only $1 million a year according to Califano, who added that food stamps and Medicaid savings that will result from removing ineligible recipients from the rolls will provide additional savings to the government.

Similar Projects

Project Integrity, "a similar computer effort," was begun to "track down unethical physicians, pharmacists and other health care providers who have tried to bilk the American taxpayer under Medicare and Medicaid." There already have been 19 indictments and eight convictions, and nearly $3 million in claims for restitution have been filed, the HEW secretary said.

Turning to Project Cross-Check, Califano said student loan programs were "plagued by management problems and a mountain of defaulted loans — $400 million in the government-run student loan program; $600 million in the campus-run student loan program."

Now, through the computer matching program, the government's collections on these defaulted loans are "running at an annual rate of more than $20 million — more than 2-1/2 times last year's rate of $8 million," he said. In addition, in fiscal 1978 "we referred to U.S. attorneys 2,650 cases of student loan defaults — compared to a total of 500 for the previous five years."

Califano also noted HEW has discovered 6,600 recent or present federal civilian employees who had defaulted on their student loans. Since September, about 3,200 have either paid in full or begun systematic repayment, he said.

Pledging to "effectively eliminate" the backlog in defaulted student loans, Califano said, "We have just begun to learn — are just beginning to learn — how to use computers" to track government programs.

DP-Related Training

Attorney General Bell, who said the Justice Department is committed to stopping fraud in government programs because "the taxpayer won't suffer that sort of conduct much longer," stated, "We need more people who understand computers, who understand data retrieval systems" to keep up with those who "are smarter than we are" in their ability to commit crimes using sophisticated new technology.

To that end, Bell said, the Justice Department has started a program to train agents of the Federal Bureau of Investigation to detect and investigate complicated white-collar and computer-related crimes.

Comptroller General Staats noted that on a governmentwide basis, "agencies have not established management information systems to deal with the fraud problem." He said his agency — the General Accounting Office — has set up a special task force for the prevention of fraud that "will concentrate on agency controls over cash and receivables, inventories and supplies.

"Since computer systems offer many possibilities for fraud, we will identify weaknesses in computer controls over payrolls, payment to vendors and cash disbursements for other purposes." Today the problem of financial controls is radically changing, he said, "as the direct result of the use of computers."

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Thirty Packages Honored With Spot on Datapro List

(Continued from Page 1)

Another block of the 1978 Honor Roll members has been on the list for three consecutive years. These include CA-Sort from Computer Associates, Inc.; DYL-260, a data manager and report writer from Dylakor Software Systems, Inc.; Easytrieve from Pansophic; IDMS from Cullinane Corp.; the Statistical Analysis System (SAS) from SAS Institute, Inc.; and Slick, a source program library system from NCI, Inc.

Even though this year's Honor Roll nearly matched the 1977 list in total number of packages — 30 vs. 32 — there is a considerable change in the makeup of the list. Eight packages are new to the list this year and 10 that were on the 1977 Honor Roll didn't make this year's edition.

To gather user ratings, Datapro mailed questionnaires to more than 36,000 DP executives, asking them to summarize their experience with whatever packages they are actively using or have recently considered.

Working with a four-point scale — 4 for excellent down to 1 for poor — the users were asked to rate each package not only on overall satisfaction, but on narrower attributes as well: throughput/efficiency, ease of installation, ease of use, documentation, vendor technical support and training.

Datapro said almost 5,700 users responded to the questionnaire and 3,300 of them supplied package evaluations, providing the researchers with 5,400 ratings to be tabulated. Two hundred and sixty packages were rated by five or more users, a spokesman noted.

The Software Honor Roll has always been dominated by systems- and utility-type packages, and the 1978 list is no different from its predecessors. Alltax and SAS are two noteworthy exceptions to that pattern.

While most of the other winners were "simple, straightforward utilities," the 1978 list includes several very complex products, including, for example, three teleprocessing monitors, three data base management systems and two operating systems intended to replace those generally provided by IBM.

Another 16 packages earned honorable mention since the ratings they earned met the Honor Roll criteria, but they were not evaluated by enough users to meet that part of the Honor Roll requirement. Like the Honor Roll, the honorable mention list is made up predominately of system and utility packages.

The 30 packages on this year's Honor Roll come from 22 vendors, the spokesman said, noting that six vendors each have two packages on the list and three of those six vendors have products in the six-time winner circle.

A report which describes the survey process in detail and provides comparison charts showing the weighted averages earned by each of the packages that received more than five ratings is available for $12 per copy from Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Pfeiffer Tells Of IBM Efforts

(Continued from Page 2)

an IBM space monitoring installation in Bermuda and then took a year off in Washington as a White House fellow. She returned to the administrative and executive assistant spots in Watson's office.

She resigned in 1976 to spend more time with her new husband, Ralph A. Pfeiffer Jr., senior IBM vice-president and chairman of IBM's Americas/Far East Corp. She acknowledged that he is considered by some to be in line for the IBM chairmanship.

Under questioning by Tobacco, Pfeiffer said IBM is now grooming women and minorities for the pool of potential vice-presidents at the division and corporate level. There have been no women divisional vice-presidents. Despite the approximately 11,000 technical and professional women at IBM, Pfeiffer said she knew of no woman who had been passed over for a vice-presidency in favor of a male.

Pfeiffer's testimony was unique in several respects. Like the past six IBM witnesses, she submitted her direct testimony in writing — but her cross-examination was unrehearsed.

For Work in Measurement

Warner Honored With A.A. Michelson Award

By Don Leavitt
CW Staff

SAN FRANCISCO — C. Dudley Warner, generally recognized as the "father of the hardware monitor," is the winner of this year's A.A. Michelson award for the advancement of computer systems measurement.

While the award was presented at the annual meeting of the Computer Measurement Group (CMG) here recently, CMG President Philip J. Kiviat noted it was made with the "advice and consent" of almost all the other U.S. measurement groups' leaders.

The citation recognized Warner's work on the original hardware monitor as well as his "personal leadership in motivating and directing people active in the field, both those involved in developing and those involved in practicing computer performance analysis."

It also saluted him for "working for the field's integrity, expansion and professionalism through continuing contributions to Share's computer measurement and evaluation project and the [Association for Computing Machinery] Sigmetrics."

Emotional Moment

Although he knew ahead of time that he was to be honored, Warner was nearly overcome with emotion as he accepted the award. He said he could not recall any other time he'd ever been at a loss for words, but all he could say on this occasion was "thank you very much."

He also noted he had experienced other tangential contacts with Michelson, the 19th-century American physicist for whom the award was named. Warner was born here in California, within sight of the mountain from which Michelson did much of his measurement work.

Warner was later assigned by IBM to work at the U.S. Navy's China Lake base in the Mojave Desert. At the base, the facility in which Warner did his work was known as the Michelson Laboratory.

Inside Story

Discussing the award later, Warner — now a vice-president at Boole & Babbage, Inc. — recounted his work, including nearly 14 years with IBM. During that time he began to see the potential — indeed, the necessity — of measuring what is going on inside a computer system.

He also recalled his departure from IBM 10 years ago and the subsequent formation of his own company, Computer Synectics, Inc.

Looking ahead, he said he thinks "traditional" hardware monitors that simply measure what goes on inside a system "probably have reached the end of their useful life." Even the minicomputer-controlled monitors that can adapt themselves to changes in the measurements they are sensing have a limited future, in Warner's view.

Hybrid monitor systems, often built into mainframes by the hardware vendor, are growing in capability and in acceptance, but monitors that provide control as well as measurement are the devices of the future, Warner said.

Possibly taking over some of the tasks now handled by operating systems, the controlling monitors would move jobs waiting for execution into the CPU based more on the characteristics of the jobs and their required resources rather than on the priorities assigned by the people who submitted them.

There is no particular reason, Warner concluded, to make people go through the effort of such assignments when the monitor, can make the same kind of decision.

Prizes Planned For Best Paper

GAITHERSBURG, Md. — First and second prizes of $300 and $100 will be awarded for the best papers presented at the 18th annual Association for Computing Machinery (ACM)/National Bureau of Standards (NBS) Technical Symposium scheduled for June 21 at NBS headquarters here.

Papers should deal with some aspect of design and delivery of user-effective systems by DP professionals.

Four double-spaced copies of the paper and a 150-word abstract should be received no later than Jan. 27 by Charles W. Bridges, 151 Fleetwood Terr., Silver Spring, Md. 20910.

January Course Set On Lease Negotiations

WINTER PARK, Fla. — A three-day course on third-party lease negotiations will be presented by International Computer Negotiations, Inc. (ICN) Jan. 22-24 at the Langford Resort Hotel here.

Some of the topics to be covered are problems in third-party contracting, how to optimize the acquisition of third-party leased equipment and negotiating strategies and tactics in leasing situations, as well as drafting and analyzing a lease document.

The registration cost is $595. ICN is at 1331 Palmetto Ave., Winter Park, Fla. 32790.

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Trade Center Systems Match Buyers, Suppliers

By Connie Winkler
CW Staff

NEW YORK — Looking for bolts in Brazil or high jump poles in Japan? The World Trade Center (WTC) here can probably find a manufacturer match for you through its various information systems including the newest, Marketmatch, which will start up in January.

Marketmatch is the latest computer information system here at this magnificent trade complex, but even Marketmatch is considerably less extensive than the system that was originally envisioned for the WTC, which is dominated by two 1;350 feet towers in lower Manhattan.

When the WTC was in the planning stages, a blue ribbon panel of suppliers was formed, including representatives of Advanced Computer Techniques and General Electric Co., to provide the center with computer and information services, according to Thomas J. Kearney, deputy director of the WTC.

The planners considered an integrated communications system with cable installed throughout the buildings to give tenants in any office online access to microfilm, facsimile transmission and CRT terminals. It would have been like a time-sharing system, Kearney said.

Although a few terminals were originally installed, the plan failed. Kearney believes that in order to serve all the tenants the system could only offer general services. However, in order for the system to be cost effective for tenants, the system needed to provide services that met their specific business needs.

"There's a continuing effort to develop the most advanced computer and communications systems for the center," Kearney said.

The World Trade Institute, which, like the WTC, is an agency of the Port Authority of New York and New Jersey, operates the center. The institute also sponsors hundreds of courses related to world trade.

Planned Facilities

Remnants of the original communications concept or systems soon to be in place include Electronic Yellow Pages and related hot lines; Interfile, the WTC's own data bank; Marketmatch and Intelpost.

Intelpost is the U.S. Postal Service's beginning of facsimile transmission, and a system operating between the two towers of the trade center is scheduled for early next year, Kearney said.

Electronic Yellow Pages is a Bell System version of the telephone book Yellow Pages, but specifically for the WTC. Located in the information center on the first floor of One World Trade Center, visitors can find the names and numbers of tenants according to the tenants' businesses. For example, using a Teletype Corp. Model 40 printer, a visitor can obtain a hardcopy listing of importers or, more specifically, importers of textiles. The listing also includes a hotline number direct to the tenant which can be dialed on adjacent phones.

However, if visitors to the information center need more than names and numbers of WTC tenants, they are directed across the room to Interfile, a bibliographic data base of many other sources of information on world trade.

Interfile, using Hazeltine Corp. terminals, has access to the *New York Times* information bank and the Systems' Development Corp. and the Lockheed Dialog service among about 100 other data bases. The most popular requests are for marketing information on certain commodities.

The terminals provide abstracts on available articles and the average Interfile search costs $20.

Interfile software and programming was supplied by Advanced Computer Techniques Corp.

Other Centers' Resources

Of course, the New York WTC can also take advantage of the resources of other trade centers around the world. The New York WTC is one of 100 trade centers in 46 countries,

(Continued on Page 12)

Rifkin Pleads Innocent to Theft

By Tim Scannell
CW Staff

LOS ANGELES — Computer consultant Stanley Mark Rifkin recently pleaded innocent to charges of using the Federal Reserve System's electronic funds transfer (EFT) system to steal $10.2 million from the Security Pacific Bank here and was released on $200,000 bail.

Rifkin's bail had been set at $6 million, but it was reduced by U.S. District Judge Matt Byrne, who noted that all of the stolen money has been accounted for by bank officials. However, Byrne put limits on Rifkin's release, instructing Rifkin to report daily to court officers, not to use unrestricted checking accounts or credit cards. Further, 10% of the suspect's bail had to be paid in cash.

The alleged mastermind's trial is set for sometime in late January.

Rifkin is accused of accessing the Fedwire system at Security Pacific to effect a multimillion-dollar transfer from the California-based bank to New York's Irving Trust Co. in favor of a Swiss correspondent bank [CW, Nov. 13]. He apparently learned the bank's identification codes and transfer procedures while employed as a consultant, then allegedly impersonated a bank official to siphon the $10.2 million from Security Pacific's vaults, a bank spokesman said.

The 32-year-old Rifkin reportedly used $8.1 million of the stolen money to buy diamonds from Russalmaz, the Soviet government's official diamond broker, and smuggled the polished gems into the U.S. He was subsequently apprehended by Federal Bureau of Investigation agents. If convicted, Rifkin faces up to 10 years in prison and a fine of up to $10,000.

Security Pacific has not yet filed any loss claims with its insurance companies to recover the more than $8 million Rifkin allegedly used to buy the jewels and won't be able to until the ownership of the diamonds is determined.

Since the late October robbery, Security Pacific has instituted several "procedural changes" within the bank's check-and-balance structure to prevent another similar incident. Most of these changes consist of a renewed set of EFT instructions and step-by-step commands for bank employees to follow.

"We've made some changes and we're always working on improving security," the bank spokesman said. "This particular incident disclosed something that obviously gave us some opportunities to further increase our security."

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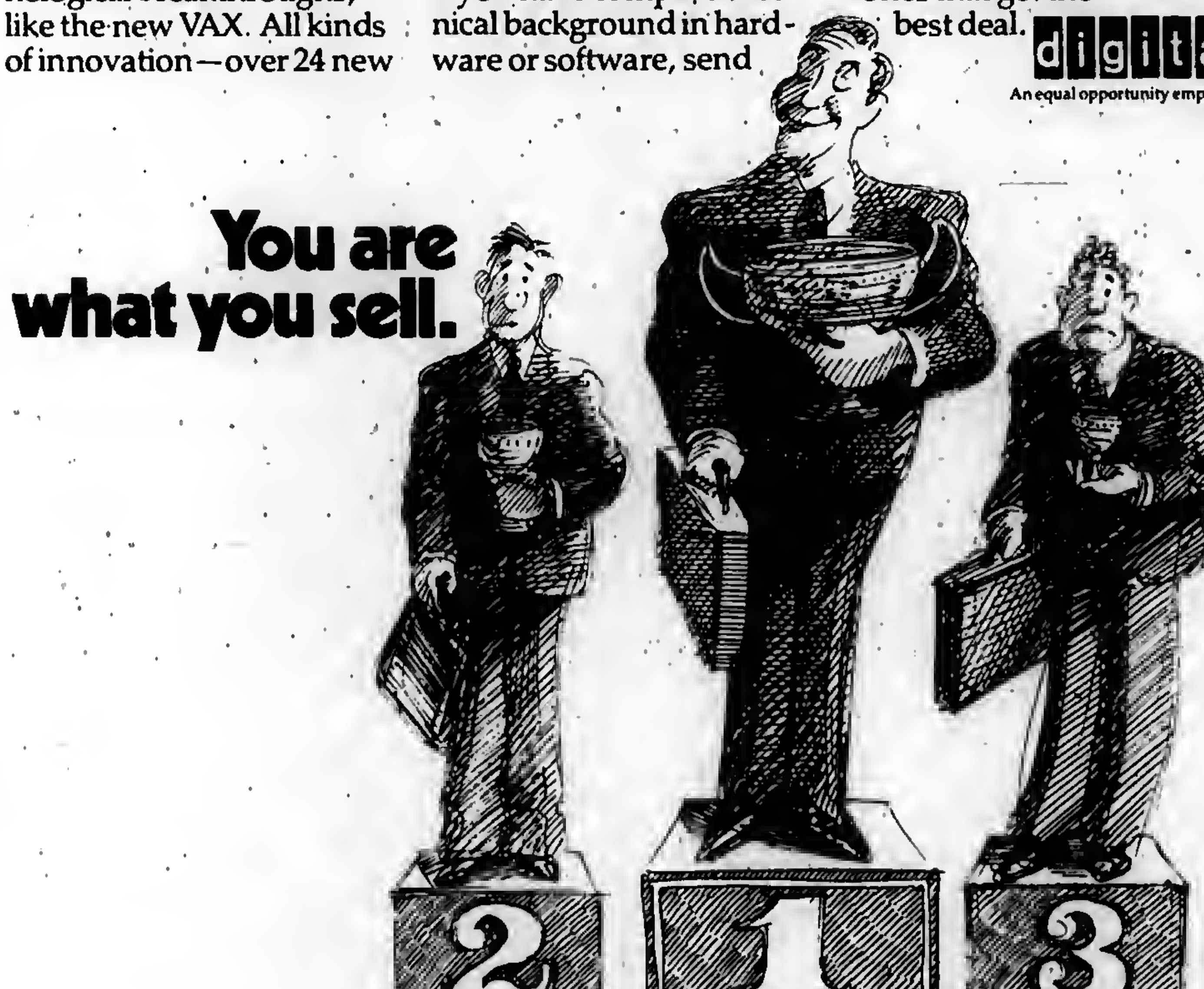
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Despite Carter's Belt-Tightening

OMB Says Federal DP to Get More Funds in '79

By Brad Schultz
CW Staff

WASHINGTON, D.C. — Although most federal government agencies can expect overall budget slashes and hiring freezes as the Carter Administration tightens its belt, federal DPers are slated for more funds and extended roles under the supervision of a revitalized Office of Management and Budget (OMB).

So said Wayne G. Granquist, OMB's associate director for management and regulatory policy, at a session of the Association for Computing Machinery 1978 convention here.

Just a few months ago, the U.S. House of Representatives Appropriations Committee concluded that a DP "policy vacuum" existed in the federal government. The committee said both OMB and the General Services Administration (GSA) had failed to provide policy direction for the government's procurement of DP goods and services under provisions of the Brooks Act [CW, Sept. 4].

But OMB has recently started to guide a massive rehabilitation of federal computing practices, Granquist said. It has already begun following some recommendations of the President's DP reorganization project, which has sharply criticized DP management practices at a number of federal sites.

For example, OMB has responded to reorganization project criticism by revising the government's system budgeting procedures, Granquist noted. Systems budgets must now be reviewed in the context of the programs they support — not as ends in themselves, he explained.

Furthermore, all federal agencies must list any DP procurements exceeding $1 million and submit these lists to OMB for release to the President, Congress and the private sector.

Granquist announced OMB publication of an annotated compendium of laws, policies and regulations pertaining to DP and telecommunications acquisitions.

The Administration has acknowledged the convergence of digital and telecommunications technologies through a just-released "major revision" of OMB Circular A-71, he noted. This circular establishes agency responsibilities for systems management.

OMB recently sent a memorandum to all federal agency chiefs that endorsed the Commerce Department's Federal Information Processing Standards (Fips) program, Granquist added. The memorandum asked each chief to give a senior official the responsibility for implementing Fips in that agency as well as assisting Commerce with its responsibilities.

Granquist told the session — attended mostly by public sector DPers — that OMB intends to expedite federal systems acquisitions while taking "advantage of the competitive marketplace," a sign that in-house systems development will be limited.

Privacy, Security Issues

The agency will also "assure that the need for individual privacy is properly balanced with the needs of society" and constrain federal data bases to include only "absolutely necessary" information while protecting confidentiality, Granquist said.

OMB has already issued a computer security policy that discourages fraud and waste in computer-supported programs, the Carter appointee added. The agency was also said to be advocating mandatory user accountability for DP expenditures and to have established with other agencies an agenda of high-priority telecommunications policy objectives.

Moreover, each state government has been asked to nominate a "point of contact" with OMB to "facilitate intergovernmental communication about the management and use of information technology."

The agency, a component of the Executive Office of the President, has acted to improve availability to the public of technical information by closely aligning the Smithsonian Institution's information exchange with the National Technical Information Service, Granquist continued.

Furthermore, OMB is considering development of a "locator system" for identifying federal information sources that would reduce dependence on outside government sources.

Other Agencies' Efforts

Granquist also cited the rehabilitative efforts of other federal agencies. GSA has recently consolidated DP and telecommunications activities, formerly treated separately by the agency's automated data and telecommunications services, he noted.

GSA was also credited with decentralizing procurement authority — cutting "red tape" — by relinquishing the control of any DP purchase less than $300,000; the "threshold for blanket delegation" had been $100,000. Many critics of federal DP management have cited unnecessarily long procurement cycle times as the primary reason for performance/application mismatches.

Granquist praised the Commerce Department for creating the National Tel-

(Continued on Page 12)

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Computer Expo Caravan Begins Tour March 13

NEWTON, Mass. — The 1979 Caravan Group of Computer Expositions, otherwise known as the Computer Expo Caravan, will visit nine cities between March 13 and May 31 and will feature several new approaches to the Caravan presentation.

This year's Caravan, produced by The Conference Co. here, will not present conference session speakers from the user community, as in previous years, but rather people who are "qualified vendors, suppliers or technical personnel," according to a spokesman.

The purpose of the change is to give attendees a glimpse into the technical future through industry members' interpretations of present and planned technology, as well as up-to-the-minute information on available applications, the spokesman explained.

The Caravan will visit each city on its schedule for three days. The same basic topics will be covered in each city. However, additional, special OEM sessions are scheduled for New York, Chicago, Los Angeles, San Francisco and Boston.

Each day of the conference will begin with a keynote address. Day One will feature a general-interest personality, Day Two will present an industry expert and Day Three will begin with words from a DP user.

After each keynote, DP "trend briefing sessions" will begin. Many of the vendor-speakers will also be exhibitors on the show floor, where last year more than 180 firms exhibited their wares. Session moderators will be consultants or press people, according to the spokesman.

Session topics will include "Distributed Data Processing," "Data Communications Control Methods" and "Small Business Systems" on Day One.

Days Two and Three

Day Two's sessions will be on "Intelligent Terminals," "Computer Micrographics" and "Plug-Compatible Processors."

The conference's last day will feature sessions on "The Electronic Office," "Superminis" and "Impact vs. Non-Impact Printers."

The special OEM sessions scheduled for five cities will discuss microcomputers (Day One), semiconductor memory alternatives (Day Two) and printers for low-cost systems (Day Three).

Nine Stops

The Caravan will begin its circuit in New York as the Mid-Atlantic Computer Expo at the New York City Coliseum on March 13-15. It will move on to Chicago as the Midwestern Computer Expo at McCormick Place March 27-29.

The Caravan's third destination is St.Paul, Minn., where it will be held at the Civic Center April 3-5. There it will be known as the Twin Cities Computer Expo.

The next stop is San Francisco, where it will be called the Northwest Computer Expo, to be held at Civic Auditorium April 17-19.

From there it will move on to the Los Angeles Convention Center April 24-26 under the name of Southern California Computer Expo. In Houston, the Southwestern Computer Expo will be held May 8-10 at the Albert Thomas Convention & Exhibit Center.

Charlotte, N.C., will be the Caravan's next stop, May 15-17. Named the Southeastern Computer Expo, it will be at the Civic Center.

The Caravan's next-to-last stop will be in Pittsburgh, Pa., May 22-24, at the Greater Pittsburgh Merchandise Mart. There it will be known as the Northeastern Computer Expo.

The final stop on the tour will be Boston at the John B. Hynes Auditorium May 29-31, where it will be the New England Computer Expo.

Conference attendees will pay $75 for a single day and $195 for the three-day program. Exhibits are free, but no one under 21 will be allowed into the show.

Further information on the Caravan is available from The Caravan Group, 60 Austin St., Newton, Mass. 02160.

Trade Center's Systems Lead Buyers to Suppliers

(Continued from Page 10)

Kearney said. Information seekers are often referred to the U.S. Commerce Department, which has its own data base and numerous directories and resources.

Another good, although more informal, source of information is the WTC's 86th floor, literally an information shopping center. Located there are offices for the Organization of American States and Amtorg Trading Corp., a Russian trade company.

And it is on the information floor that the latest Marketmatch is being launched. Marketmatch will tell who manufactures and sells what, where and for how long.

"Call it the Yankee Peddler instinct if you will," Gerald L. Lieberman, manager of the World Trade Information Center said, "but one of the things we became aware of because of Interfile is that two-thirds of the people are really looking for trade leads."

This seems especially true in 1978 when Americans are beginning to appreciate the balance of trade problems, Lieberman added.

Marketmatch is the answer to that demand. Planned for January, it provides listings of buyers and sellers around the world and their various product lines.

The Marketmatch data base will be stored on the Port Authority's two IBM 370/158s, also located in the WTC. The computer searches will start specifically — for vaulting poles and Japan, for example — and then broaden to more general categories.

Because business persons are hesitant to support something unless they make a profit, Marketmatch will be funded by commissions based on matches made. Again, Hazeltine terminals and printers will provide printouts of the information.

Trade centers in Canada and Tokyo are already interested in tying into Marketmatch, Lieberman added.

Federal DP to Get More

(Continued from Page 11)

ecommunications and Information Administration, which ended the federal estrangement of telecommunications issues — addressed by the now-defunct Office of Telecommunications Policy — from those of DP, formerly delegated to OMB.

Commerce was also lauded for its attempt to strengthen the Fips program through a five-year plan that reportedly includes cost-benefit appraisals and annual status reports.

The Department of Health, Education and Welfare (HEW) is considering automation of welfare eligibility determination procedures — a "direct result" of a reorganization project recommendation — and has instituted computerized fraud-detection systems, he continued.

Finally, the Department of Defense is working to improve career paths for military DP professionals and to enhance system life-cycle management. A report of the reorganization project's national security team charged the Pentagon with a scarcity of DP expertise in senior officer grades and alleged that certain important military systems are obsolete or unreliable [CW, Aug. 7].

Although President Carter is committed to holding the federal deficit to less than $30 billion in fiscal 1980, he has recommended a $500 million increase in DP resources for fiscal 1979, Granquist stated.

The Administration depends heavily on federal DP managers in seeking to improve the delivery of government services, upgrade the total government work force, lower the deficit and streamline the bureaucracy, he told the session.

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Brooks Unrelenting in Fight for Better U.S. DP

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Despite all the news made recently by the President's federal DP reorganization project and by the revamping of various federal agency DP guidelines, Rep. Jack Brooks (D-Texas) contends his is still the loudest voice in the debate for better government use of data processing.

Brooks made the boast at the recent annual conference of the Association for Computing Machinery here, where the problems the government faces in acquiring and utilizing DP equipment and services were debated.

A 14-term member of the House of Representatives and chairman of its Government Operations Committee, Brooks is best known in the DP community for the law bearing his name, The Brooks Act of 1965. Officially known as Public Law 89-306, it sets the basic guidelines for the acquisition and use of DP equipment by the federal government.

Introduced as a man "evenhanded in passing out hell for things that don't go well," Brooks said that even though Public Law 89-306 has been credited with saving the government more than $3 billion since its enactment, there remains much to accomplish in streamlining government DP.

"The new Congress will be faced with a number of reorganizational proposals and legislative suggestions designed to improve the effectiveness and efficiency of the government," he pointed out. However, none of them can be successful "unless we can establish good management in all our government agencies and programs," and a "fundamental part" of that is "the proper application of DP technology."

According to Brooks, "the solution to much of the existing administrative inefficiency" in government DP today rests with "full and effective implementation" of Public Law 89-306. "That's an oversimplification," he admitted, "but that's the guts of it."

The Brooks Act has two "basic objectives," he explained: fully competitive procurement of DP resources and procurement of only those resources which are necessary and can "assist the management of government programs." The problem is that "unfortunately, what's being saved in meeting the first objective is being lost in the failure to meet the second objective."

The Government Operations Committee has found federal agencies suffering from inefficient and outdated software, designing systems that do not match their needs and making procurements without "adequate justification to assure they will meet known needs," Brooks said.

Much of the problem, he said, rests with the "central management agencies" — the Office of Management and Budget (OMB), the General Services Administration (GSA) and the Department of Commerce's National Bureau of Standards (NSB).

According to Brooks, the OMB has failed to establish "concise, clear-cut policy" and the GSA has "repeatedly authorized noncompetitive procurements" and has not enforced its regulations. In addition, he said, the NBS has not provided the necessary hardware and software standards.

"Hell, I'll be dead when they figure out what the standards will be," Brooks said.

The law has just not been followed, he said. Federal agencies "continue to wait for the law to do something for them before they will support it," but the "austere budget" expected from President Carter next year "may get the agencies' attention."

Turning his attention to the DP industry, Brooks suggested vendors might be taking advantage of the situation to increase their sales. Saying he "really admires the wonderful selling jobs you do," the congressman told the industry "you lead me a pretty merry chase by working over these agencies."

The agencies "already hate OMB: they hate the Congress," so you go in "with a lot of cards," Brooks said. He has no objection to government acquisition of "the most advanced technology available and, indeed, would encourage it," but not for its own sake: "Automation or enhancement of an obsolete function will, at best, make it a more efficient obsolete function."

He conceded that even though Public Law 89-306 provides "the basic managerial framework" to correct many of these problems, there are still "certain initiatives" that must be taken:

- The OMB must "transform itself from its current advisory role to one of more direct managerial involvement."
- The GSA must "move more aggressively" to ensure that its regulations and governmentwide policies are being followed by the operating agencies."
- The NBS must assume its responsibility for developing "meaningful standards."
- The operating agencies must start following the Brooks Act's provisions.

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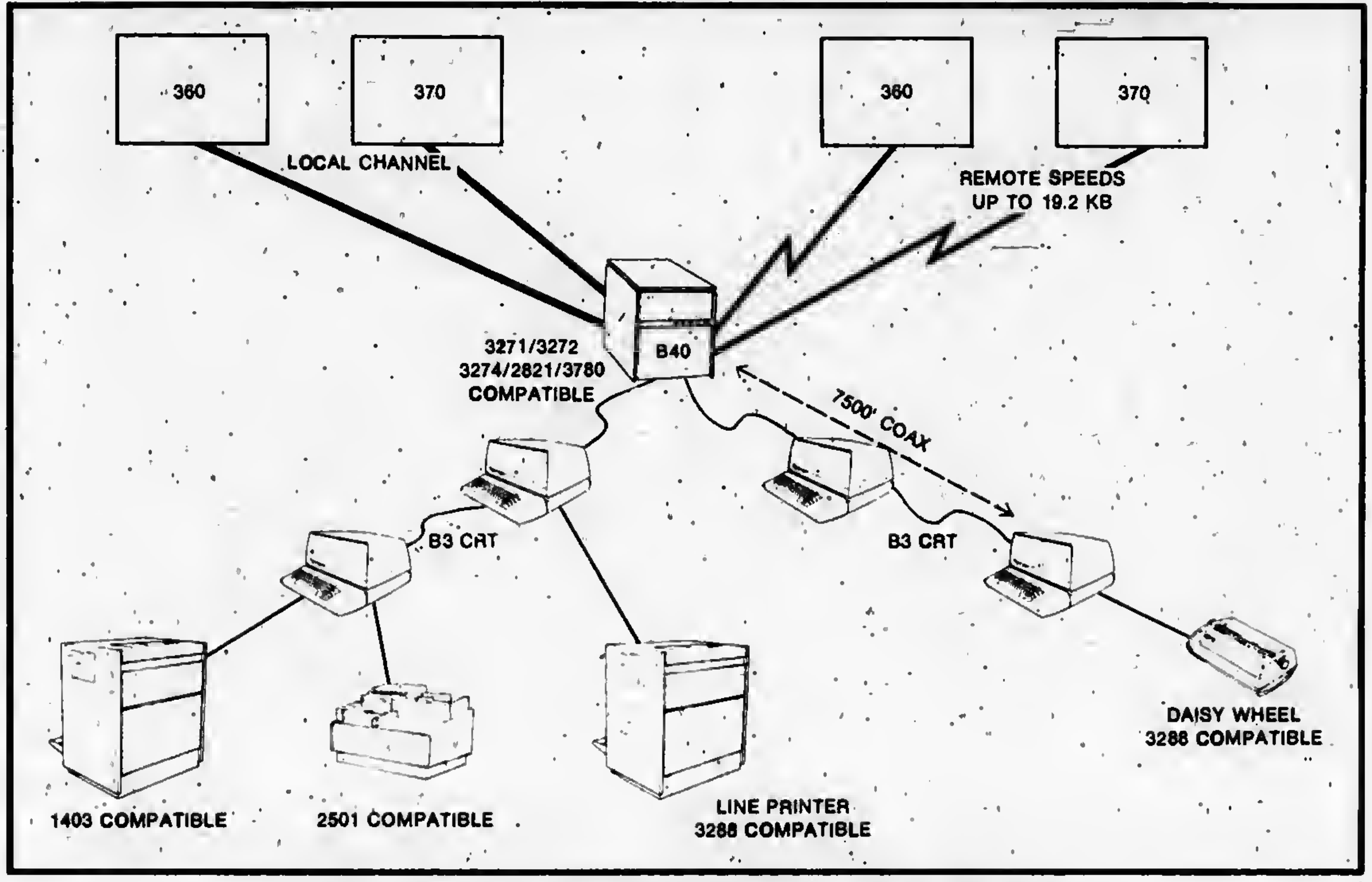
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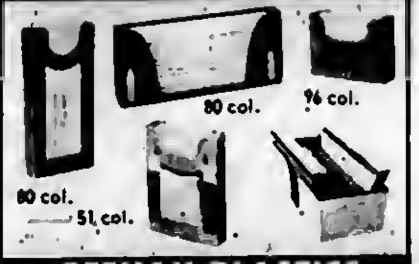

BEEMAK PLASTICS

Slip of MMIS System?

Payment Authorized for At-Home Surgery

By Tim Scannell
CW Staff

COLUMBUS, Ohio — Birth control pills for a menstruating man, major heart surgery at home and dental flouride treatments for a toothless baby were among some of the claims authorized by this state's computerized Medicaid processing system during an extensive five-year test conducted by the U.S. General Accounting Office (GAO).

Federal investigators developed and ran a punched-card test deck consisting of 261 dental, hospital, pharmacy and physician claims through Ohio's Medicaid computer and unearthed a number of administrative inefficiencies and reliability problems, including the possibility of fraudulent or improper usage of the processing machinery, according to a recently issued GAO report.

In fact, 12% of the test claims processed through the state's computer contained some sort of error. The most significant types were those dealing with a recipient's age or sex and diagnosed problems; diagnosed problems and relative medical procedures; drug dispensing quantities; and duplicate claims, the report stated.

However, Department of Public Welfare officials here disagree with many of the inadequacies uncovered by the GAO investigators and question the validity of a number of points highlighted in the 146-page report. "The kinds of claims [the GAO] prepared were wild-type situations," according to Clark Law, executive assistant to the welfare director. "We're not going to get any dental flouride treatment claims for infants and that's all there is to it.

"There are things [in the report] that are just so far out of the ordinary that we didn't build those kind of edits . . . because they probably were not cost-effective to institute," Law stated.

The GAO investigation began in mid-1972 and focused on Ohio's Medicaid Management Information System (MMIS), a packaged software program developed and certified by the U.S. Department of Health, Education and Welfare (HEW) that is now implemented in 17 states.

The system reportedly facilitates claims processing and is used by Ohio's Welfare Department to generate data contained in more than 20 administrative reports. The system also processes more than $600 million a year in claims that include doctor and dentist fees, drugs, medical equipment, hospital facilities and laboratory tests.

The GAO test showed that Ohio's MMIS did not incorporate or adequately perform some of the 40 general checks that are required by HEW to be a part of each state's computerized processing system. For instance, Ohio's computer examines only 25 procedures that check a medical or surgical procedure against a person's age; the State of Washington's system scrutinizes about 400, the report pointed out.

Since the federal government subsidizes approximately 54% of Ohio's welfare claims system, failure to comply with certain basic HEW qualifications could result in an eventual suspension of these funds until the problems are cleared up, a state official said.

More Than Adequate

Law, however, contended that Ohio's Medicaid screening system is more than adequate and noted, as an example, that the system spotlighted 72 probable cases of fraud within the past year. The speed and dependability of the system as a whole would be severely hampered if too many extraneous checks were injected into the editing process, he added.

"Through trial and error, we found a number of edits that never were catching any real claims," Law explained. "It didn't make sense to have them in the program, we just dropped them."

Most of the edits or procedural checks deemed necessary by HEW were eliminated during the early developmental phases of Ohio's MMIS. Ohio's Welfare Department was the pilot program for the system, and state officials neglected to run a parallel claims program in background to initial MMIS testing, Law recalled.

As a result, superfluous screening steps and procedures were left out in the race to get the state's twin IBM 370/155 systems operational and to minimize a growing backlog of provider claims from Ohio's 88 counties.

"We went through a two-year period before we could get our system purified and make sure that all of the edits cross-related. We were holding up bills from providers for three or four months because of all the bugs in the system," Law recalled.

Lack of Control

The GAO also charged that Ohio's system lacked adequate controls over program documentation and testing. Programmers did not need authorization to change vital processing programs, and most of Ohio's documentation did not include a sufficient description of systems, program flow charts, programs, I/O examples, operating procedures, test decks and record layouts, the report claimed.

As an example of Ohio's control over MMIS programming procedures, the GAO singled out an active computer program that did not have the proper authorization, was not fully documented, was not listed as a part of the flowchart describing the total system and whose existence was unknown to the computer operations staff.

However, Law asserted that Ohio's MMIS documentation and authorization procedures are more than suitable. "We listened and listened to our computer people and discovered there is a big difference of opinion as to what constitutes an adequate documentation system," he noted. "Our people say Ohio's system is more than adequate and the GAO says it is not — we just did not have the kind of system [the GAO] wanted us to have."

Most of the problems listed in the detailed report have been corrected because the welfare officials had the chance to work with federal officials during the investigation and to review the study several months before it was published. However, a number of procedural and editing changes haven't been made yet because they require specialized legislative passage or additional budgeting or staff support, according to Kenneth Creasy, director of the Welfare Department.

"We're bound in a number of areas to do what we're doing by state law, and we have no authority to make the adjustments," Creasy stated. "We're also in the middle of a budget cycle and presently have no appropriation for these changes."

Not Acceptable

On the other hand, state officials refuse to totally accept the GAO's recommendations or implement all of HEW's MMIS standards, which include a complete manual screening of every claim before it is run through the Welfare Department's system. "We just don't feel that's realistic in a state the size of Ohio," Law insisted.

Under the present system, 25% of the medical claims are manually prescreened and an additional 5% are kicked out of the computer for further inspection.

Law explained that every one of the 17 states currently using the MMIS package have the potential for making the same kinds of mistakes spotted in Ohio's system. In fact, a scaled-down GAO study of Michigan's welfare claims processing computer recently revealed identical errors involving menstruating men and kitchen-table heart surgery.

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Conn. Court Tables Debate On Sunday Use of ATMs

By Ronald A. Frank
CW Staff

STAMFORD, Conn. — The question of whether bank terminals have more power than humans has been temporarily put aside by a recent court order.

The First Stamford Bank and Trust Co. here had brought suit against several local banks, complaining that automated teller machines (ATM) were allowed to operate under Sunday blue laws while Stamford's human tellers had to stay home [CW, Nov. 20].

Since the First Stamford suit was filed, a New Haven Superior Court judge has set aside the blue laws on the grounds that too many businesses other than banks were exempt from the law and thus allowed to operate on Sunday.

The New Haven decision will probably be appealed to the Connecticut Supreme Court. Meanwhile, First Stamford is continuing to operate for several hours on Sunday mornings with good customer response, according to its president, Norman Rader.

Reader's suit was originally filed because ATMs were operating on Sunday despite the blue law, while First Stamford was prohibited from staying open with human tellers. Reader claimed that banks with ATMs had to have backup personnel working at DP centers to support the ATMs, which violated the Sunday closing law and had anticompetitive effects on First Stamford's business.

One solution to the problem would be for banks to be exempt from the Sunday closing law, but the New Haven decision said too many businesses already were allowed to operate. Consequently, legal sources feel it is unlikely that banks will be added to the exempt list if a new blue law is enacted when the legislature meets in January.

Meanwhile, First Stamford tellers are greeting customers on Sunday mornings and the issue of whether machines have more power than humans under the law remains to be resolved.

Study Says DP-Assisted Planning Makes Grade

By Howard A. Karten
CW Staff

LOS ANGELES — Computer-based models for short- and long-term corporate planning are gaining acceptance among the nation's major corporations and are getting high marks from the chief executive officers (CEOs) of the using firms, according to a recent national survey.

The results of the survey were published in "A Chief Executive Perspective on Computer-Based Planning," a paper by Dr. E.R. McLean, associate professor of information systems at the University of California's Los Angeles Graduate School of Management. Sixty percent of the 410 U.S. firms that responded said they are using models.

The survey was sent to 1,240 firms selected from the Fortune 1,000 list for 1976 as well as Fortune's list of banks and other financial institutions, transportation companies, utilities and retailers.

Big Business Users

The firms responding to the survey ranged from just under $100 million in sales to $48.6 billion in sales, with a mean of $1.43 billion and a median of $532 million. This means the companies responding "are relatively large, mature organizations representing the mainstream of American industry," the study noted.

Financial firms are more likely to use a computer-based technique than manufacturing firms, the study indicated. It also found 77% of the responding companies engaged in banking, finance or insurance used computer-based planning, while only 55% of the respondents engaged in manufacturing did so.

Citing earlier studies, the paper noted the number of firms using this technique has increased steadily since 1969, when 65 respondents to a similar survey indicated they were using this method.

Among the various tools used in business planning, computer-based models rank fourth in popularity, behind budget planning (used by 97% of the respondents), market research (81%) and econometric-type forcasting (61%).

Financial Planning Help

Computer-based planning is used most commonly in financial planning, the study found. Of the 245 firms that do use this method, 85% use it for financial planning, while only 37% apply it to either marketing planning or production planning.

However, 59% of the users apply the method to overall corporate planning.

Those firms with corporate planning departments are more likely to use computer-based planning than those without them; 72% of the companies with corporate planning departments use such models, while only 44% of the firms with no planning departments use them.

Surprisingly, firms with decentralized planning are more likely to use computer-based planning models than firms with centralized planning; 58% of the former use such models while only 43% of the latter employ them. The study found this difference to be statistically significant.

Both CEOs and non-CEOs were generally pleased with the technique, the study indicated. On a scale of 1 to 7, with 1 representing "worthless" and 7 "invaluable," a mode of 5 was calculated.

Goldwater Endorses Safeguarding Of Individual Right to Privacy

Special to CW

CHICAGO — The implied right of privacy soon will have to be more than implied if the individual is to be protected in the coming era of instant information, Rep. Barry M. Goldwater Jr. (R-Calif.) told participants at the 10th Anniversary Professional Training Conference, sponsored by Advanced Systems, Inc. here recently.

"The right of an individual to maintain personal privacy is, in my mind, as precious as any guarantees articulated by the Bill of Rights," he said. "The right of an individual to conduct his business without unwarranted intrusion or harrassment is just as important as giving the accused a speedy trial."

"Paradoxically, however, the right to privacy was never explicitly mentioned in the Bill of Rights or any part of the Constitution," he said. "Yet without some assurance of privacy — without the protection of our personal privacy — the First, the Third, the Fourth, the Fifth and the Ninth Amendments would be rendered meaningless."

Common Practice

Goldwater said people tend to take the right of privacy for granted unless they find themselves victimized by an invasion of privacy. "The odds are 50-50 that your privacy will be invaded. It happens all the time," he remarked.

"President Carter's name once appeared in a Justice Department file on a Sumter County, Ga., school investigation. He was supposed to have told the parent of a black child that the child would have to leave that integrated school or the family would be forced off their farm.

"This particular file came to light in 1976 and proved to be totally false. Even the alleged accusers denied that they had made that charge," Goldwater explained. "The point is that it was in a file and subject to misuse and could have caused great harm."

Define Circumstances

Goldwater told his audience that it is up to society, especially the private sector, to precisely define under what circumstances organizations can have legitimate access to data on an individual. If private enterprise refuses to voluntarily work to correct the privacy situation, Congress will legislate, he warned.

During the past session of Congress, legislation was drafted in four areas: individual records in financial institutions, medical records, educational records and — in general — governmental access to nongovernmental records.

Of these, legislation dealing with financial institutions has been passed and sent to President Carter for his signature. That is Title 11 of the Financial Institutions Regulation Act of 1978, a committee version of a bill submitted by Goldwater and former Rep. Edward Koch (D-N.Y.), now mayor of New York City.

To those in DP, he directed a special appeal: "The part you play allows free enterprise to function and function well. Management looks to you for your expertise, for your advice and counsel and there I think you have an influential position in the decision-making process."

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Editorial

OMB Rising to the Occasion

Just a few months ago, the U.S. House of Representatives Appropriations Committee complained to Congress that a DP "policy vacuum" existed in the federal government.

Both the Office of Management and Budget [OMB] and the General Services Administration (GSA) had failed to provide policy direction for federal procurement of computer systems and services, the committee maintained [CW, Sept. 4].

The committee based its conclusions on a report from its investigative staff, which had called OMB "ineffectual, producing no policy guidance whatsoever."

Nevertheless, both Appropriations investigators and the committee itself agreed that OMB should be made the solitary policy director on federal DP procurement.

And now that troubled component of the Executive Office of the President is apparently rising to the occasion.

Before a session of the recent 1978 Association for Computing Machinery conference in Washington, D.C., Wayne G. Granquist, OMB Associate Director for Management and Regulatory Policy, declared his agency's commitment to a massive rehabilitation of federal DP practices (See story on Page 11).

According to Granquist, a "major revision" of the swarm of procurement rules, regulations and guidelines that have befuddled vendors in the past — often requiring them to hire expensive "government sales consultants" as guides through the forest — is already under way.

Granquist indicated that under OMB's supervision, government procurement cycle times will be narrowed and requests for proposals will be more cognizant of the full effects of systems procurement — such as systems' lifetimes and needs for software conversion.

OMB intends to "take advantage of the competitive marketplace," Granquist told the session. The office will also "assure that the need for individual privacy is properly balanced with the needs of society."

These are stirring words. This country's present economic woes beg for far more responsible and better managed government, and the computer industry produces the tools with which such reforms can be implemented.

Hopefully OMB will meet its proclaimed objectives and get full cooperation from other federal agencies that do the DP consuming as well as the Congress, which decides how to pay for it.

Bankers Beware

Twice in the past several months, the Federal Reserve System's computerized Federal Reserve Communications System (Fedwire) has been involved in theft schemes involving impersonation and unauthorized use of identification codes.

This summer, an individual with previous knowledge of Bausch & Lomh Co.'s accounting procedures impersonated that firm's corporate treasurer and attempted to direct $140,000 from a Security Pacific bank near San Diego to the Lincoln National Bank in Rochester, N.Y., by use of Fedwire [CW, Aug. 14].

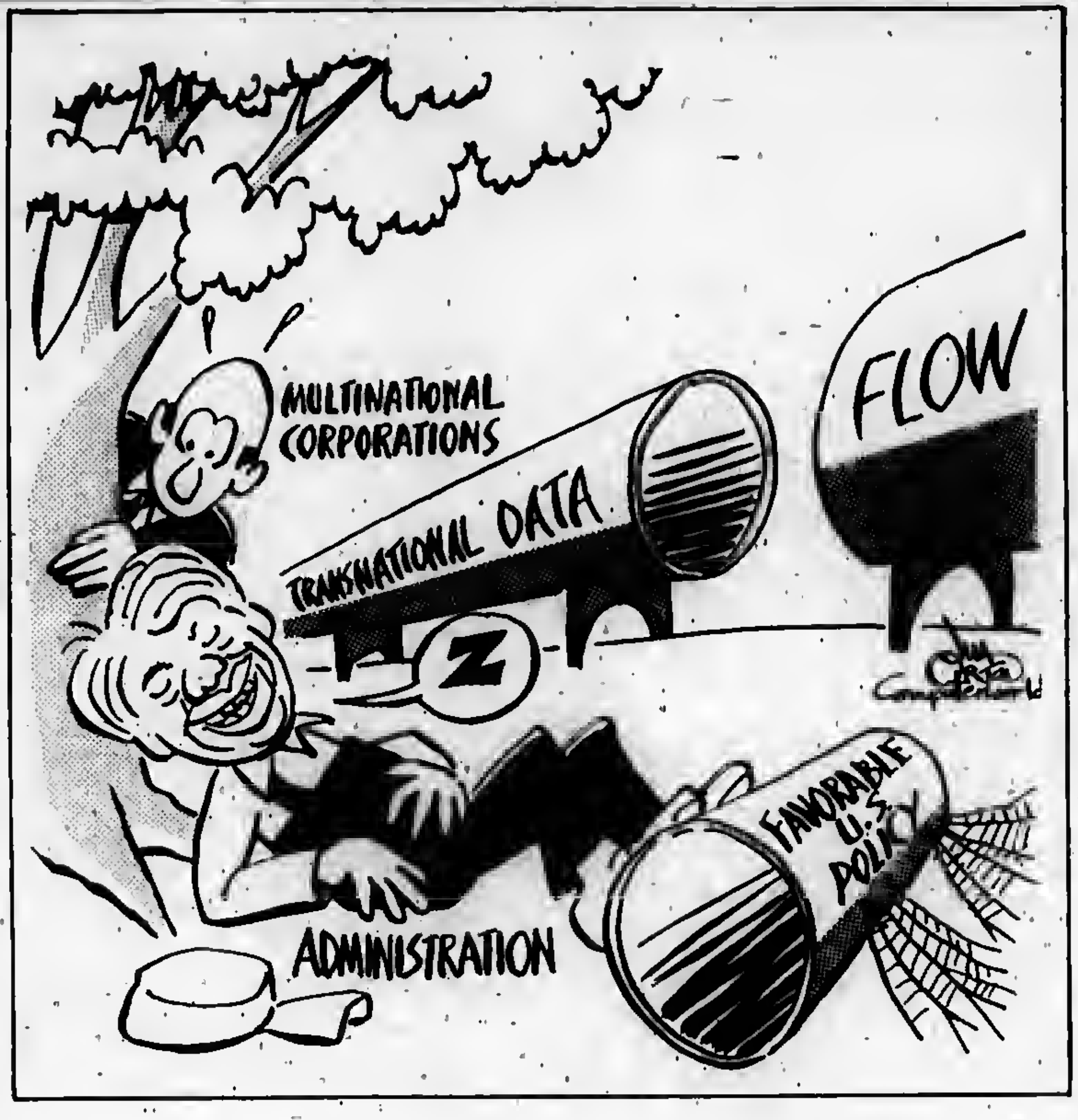
Fortunately, Security Pacific smelled a rat and alerted authorities in time for them to apprehend the culprit, who has since been convicted and imprisoned. The funds were not sent.

Security Pacific was not as fortunate last month when Stanley Mark Rifkin allegedly negotiated a theft of $10.2 million, which did pass through Fedwire and was used to purchase diamonds [CW, Nov. 13].

Communications security is a critical aspect of overall electronic funds transfer (EFT) security but so is security of the physical installation. Rifkin allegedly just walked into a coding room of a Los Angeles Security Pacific branch, observed the day's coding and a few hours later used that information to make the transfer.

These two episodes point up a simple fact: Total EFT security is only as good as the trust placed in those personnel with the highest level of access privileges.

If that trust is not well-founded at *all* EFT network nodes, the threat of an epidemic of large dollar embezzlements is very real indeed.



Data Past

Five Years Ago
Dec. 19, 1973

LOS ANGELES — Representatives of some 80 service bureaus attended an energy crisis rally here and unanimously supported an effort to avert a city proposal for cutting business hours to 50 hours a week.

— — —

BOSTON — Gov. Francis W. Sargent appointed a special Commission on Privacy of Personal Data.

Eight Years Ago
Dec. 23, 1970

WASHINGTON, D.C. — The Federal Bureau of Investigation won a federal grant to create a computerized national criminal history, or "rap sheet" file. The decision to award the grant came from Attorney General John N. Mitchell after a lengthy internal Justice Department struggle with the Law Enforcement Assistance Administration.

Letters to the Editor

Price Tag on Lives

The editorial on redundancy in air traffic control (ATC) systems [CW, Dec. 4] asked, "How can the Federal Aviation Administration put a price tag on the people aboard a 747, a Lear Jet or even a Piper Cub — to say nothing of any people on the ground — who might be injured or killed if an accident occurs?" I am amazed at that question.

We place a price tag on human lives all the time:

1. Air travel would be safer if all aircraft were equipped with transponders, radar and radio altimeters. They are not, for the cost would be prohibitive.

2. Air travel would be safer if all air traffic were under the positive control of a regional ATC center. Presently, only aircraft flying instrument flight plans or flying above a certain altitude are required to be under such control. Again, the cost would be prohibitive.

3. Air travel would be safer if all pilots were required to be instrument rated, if all pilots were required to have a minimum of 200, rather than 40, hours to qualify for a license and if all pilots were trained in aerobatics. Again, the cost would be prohibitive.

We place a price tag on human lives all the time, and I would expect *Computerworld* to help us explore intelligently the means by which we can arrive at the correct price tag, not to make hysterical statements like, "And any argument about the cost is irrelevant."

Robert M. Hamer
Iowa City, Iowa

Cullinane Responds

In response to David R. Kemler's letter of Dec. 4 ["Product Not a First"], I would like to explain what the Cullinane Corp. VM/CMS version of IDMS does and why we believe it is the only system of its type operating in the VM/CMS environment.

The product we announced [CW, Nov. 13] is not just a version of IDMS that operates in a CMS environment. We realize that many data base systems including IDMS have been running in this environment for many years. What we did develop that we feel is unique is a central version of IDMS that operates under a VS/I or DOS/VS operating system under VM and can be accessed by both application programs in that host operating system and by CMS applications.

This means that the single copy of IDMS can service both CMS and intraoperating system programs and provide full multithreading of all data base requests and protection against concurrent update of the same record. This is accomplished by using the VM Communication Facility (VMCF) to transmit data base requests from the CMS programs to the central version of IDMS.

We believe at the time we wrote the system, and still believe, that this facility is unique among data base systems and that the IDMS VM/CMS system provides the only true central version that allows retrieval and updating of a data base from both CMS applications and normal host operating system applications concurrently.

Robert N. Goldman
Senior Vice-President
Cullinane Corp.
Wellesley, Mass.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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The Human Connection

Micro-Based Gadgets Top Christmas Lists

By Jack Stone
Special to CW

"I've called this staff meeting because we've got problems, and I mean big problems! Those gadget-happy Americans have lost their collective minds and gone gaga over microcomputer-based gifts.

"Everybody — simply *everybody* — is writing in and asking for micro this and micro that. It used to be that people would ask for a plain ol' backgammon set, for example. But now? It's got to be a computer-driven, self-playing backgammon system, with the multiple level of difficulty option.

"Our suppliers are running their plants full steam but they can't keep up with the demand. So I've got to make some tough decisions and ration out the goodies we do have in stock. Let's start by opening this bag of letters and choosing some at random.

" 'Dear Santa: I am a stockbroker and want a gift to help me with my business calculations. I've never been very good at math and I'm rather overwhelmed with the idea of calculators and computers. But everybody tells me I need that programmable business calculator that can do x-y exchange, roll down and store and recall and has 20 user's registers, five financial registers and eight program lines which, of course, are expandable to 99. Oh, yes, it also has a wide assortment of built-in mathematical, statistical and business functions.'

"Send him that stripped-down $8.95 nonprogrammable basic arithmetic unit and migrate him to the programmables in the 1981 time frame.

From Radio Buff

"Now this one. 'Dear Santa: I'm a computer programmer who must work constantly to get my jobs done. Frequently, I have to stay late at the office and I miss my mobile radio monitor, which I have to leave at home for my kids. It gives me total release from the day-to-day drudgery of preparing Cobol code. Monitoring special public radio frequencies like police, fire, ham, VHF, weather and Amtrak gives me a sense of faraway adventure and international intrigue plus feelings of love and beauty and romance. Can you send me a new one?'

"Luckily we have one for him in stock. It's the microprocessor-based monitor system with the programmable scanner to allow for preselection scanning of any 16 of 16,650 frequencies. It has the additional features of three control modes, monitoring, scanning or exploring; auto/manual scan options; high-speed skipper circuit; and variable squelch."

"Here's the next one. 'Dear Santa: I'm a brilliant 12-year-old child who is positively bored playing chess with all the local hacks. To keep my mind appropriately active and agile, I wish to request a gift in the form of a computer-based chess opponent.'

"We can give her the portable micro-chess unit which won't stop at a draw; competes with the *double advance* and en passant moves; provides queening and castling capability; recalls all moves; corrects obvious blunders on the kid's part; inhibits illegal moves; sets alternative think times; and lets her inspect the microcomputer/opponent's analytical processes prior to a move.'

Microcalculator Game

"Let's see what this one has to say. 'Dear Santa: My brother-in-law insists on watching the Monday night movie on TV while the rest of us want to see the football game. I'd like to ask for a present for him, to keep him well-occupied.'

"Send him the Battleship Galactica microcalculator game. Surely you can find it. It looks like a hand-held calculator but is actually programmed for the one game. It enables the invading aliens, the Cylons, to launch a maximum of 20 salvos of intelligent laser torpedos toward the friendly forces. Scores are aggregated as a function of early intercept.

"And this one. 'Dear Santa: I am a director of management information systems and frankly, I'm a little insecure in my position. My problem is that my pay is so high and my obsolescence so great that I must begin to build my skills as an independent software supplier. Would you send me a system?'

"This one's going to need all the help he can get. Send him that 32K random-access memory business system with twin micro-floppies, 12-in. CRT and keyboard, 5 by 7 dot matrix printer with print speed of 80 char./sec nominal and full Basic. And don't forget to include the manual called *A Beginner's Guide to Basic!*"

Happy Holidays!

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

The Taylor Report

Vague Contracts Led To Problems With Fics

By Alan Taylor
Special to CW

Three contracts stand behind the Financial Information and Control System (Fics) — a modified State of Louisiana system — supplied by Arthur Andersen & Co. to the city of Detroit [CW, Oct. 30, Dec. 4].

These consultant-type contracts are as follows: a preliminary contract dated May 1974, a central contract dated November 1974 and a follow-up contract dated June 1975. The contracts are said to provide "assistance," rather than goods.

As Price Waterhouse & Co. said in its five-year audit report dated January 1978 — perhaps the clearest document in the public files — Fics works for the city financial director, not for the people who work in the city departments.

The reason is plain; the departments are responsible for doing an economical and effective job. But the city director only wants the job done and all those government forms filled out.

Fics Criticized

The January 1978 Price Waterhouse report certainly suggests that contractual breaches are involved, as Marie D. Farrell-Donaldson, Detroit's auditor-general, recently pointed out to the city council. But it's too late to get software of good quality.

How *did* Arthur Andersen succeed in supplying a system that didn't help the departments do their jobs?

Perry Koslowski, president of Detroit's Senior Accountants, Analysts and Appraisers Association (a city government employees' union), asked Farrell-Donaldson nearly the same question on Jan. 20, 1977, the year before the Price Waterhouse report came out. He put it this way:

"How can any centralized accounting system, such as the Fics system designed by Arthur Andersen, be so inadequate compared with its reported cost of more than $5 million?"

Almost immediately after Fics' implementation, a city audit department group reporting to the auditor-general documented in an Oct. 7, 1975 report that the Fics project team decided on systems design *before* it contacted departments for input.

In addition, the training courses were said to consist mainly of handouts on how to fill out forms. The instructors were reportedly unable to answer most trainee questions.

Personnel were told to use specific reporting methods rather

(Continued on Page 20)

White Hat, Black Hat

Article on Chinese DP Well Worth Reading

By Dr. Herbert R.J. Grosch
Special to CW

One of the most worrisome challenges of our trade is to keep abreast of the publications. Stuff we would give our eyeteeth to know about keeps appearing in unlikely places. Even if it is not entirely missed by the review journals and the various peer networks — artificial intelligence; performance measurement — it may not become widely known until its novelty and pungency have died down.

I don't want this to happen to an unexpected article about computing and computers in the People's Republic of China (PRC) and about the sociological problems posed for U.S. manufacturers who want to invade that market.

The author is a child-abuse researcher, of all the unlikely disciplines! He went with a group of other Northwestern University professors and camp followers on a tour of the PRC in early 1977.

One of the bunch was Lorraine Borman, from Northwestern's computing center, and she was recently appointed editor of the rather small bulletin of the ACM Special Interest Group on the Social and Behavioral Science of Computing (Sigsoc).

So, in the October issue of that publication, going mostly to members of the group, is a 20-page article by Prof. Andrew C. Gordon, "Computers and Politics in China."

After an introduction by the editor, Gordon begins an enthusiastic review of Chinese political history and progress, with allusions to infant mortality, the space and nuclear programs and so on. He references recent science articles in the *Peking Review* and more general journals which I intend to read right away. He also references the *Computerworld* stories [Sept. 4] on the Spin conference in Spain.

He gives us other good footnotes and bibliographical material, shows a photograph of the Peking University DJS-18 and reproduces a program printout, with interpretation by a Northwestern software artist. He acknowledges material from Control Data Corp. which has been welcomed in Peking as a possible supplier.

The whole article was well done — and by a sociologist, for heaven's sake!

Perspectives Missed

However, as a sometime user of computers and not really a member of either the hardware or software side of our business, Gordon missed some important

(Continued on Page 18)

Well-Written Article Explores Chinese DP

(Continued from Poge 17)

perspectives. For instance, he reports a comment by Kuo in Ed Berkeley's magazine: "How many universities [in the U.S.] can boast of operational computers, however small, built and developed chiefly by students. Several universities . . . in China can make that claim."

But several very major computers, notably the first Illiac, were built that way — 20 years ago. Not now, of course. And how about the personal computers being assembled by individual students and small teams and clubs, not only in universities but in high schools?

I admire his enthusiasm — or perhaps I should say his report of Chinese enthusiasm — for down-to-earth science. He says scientists are admonished to "familiarize themselves with actual conditions, eschew technical magnificence and tackle projects which appear beneath their dignity." Sounds like me making a speech at some computer science hobtbed like Carnegie-Mellon!

But then he goes on to say that physicists not only built their own research equipment, but the building which housed it. And there we diverge.

There are two disagreements here. One revolves around a definition of "worker."

Gordon reports, and makes me feel he supports, a view that the workers in a factory, or in a scientific or medical establishment, are a swarm of faceless peasants, each carrying one basket of dirt or one balk of timber — or one beaker of chip juice.

Those students that built the university computers, for example: all 4.0-identical in their white lab coats. Me, now — I consider Gene Amdahl a worker (or at least, Surly Seymour!). Surely there has to be individual excellence, genuine leadership?

I realize the Northwestern tour came just at the Gang of Four/post-Mao turnaround and that a visit today might produce a picture a little less like that of a hive or a termite nest.

Specialization

The other divergence is related and concerns specialization. Our Western culture, especially as exemplified by high-technology enterprise, has opted for narrow expertise and division of tasks. And I really don't see how fancy science and technology can go any other way.

Put aside the assembly line sort of argument, and the efficiency-expert conflict about simplification vs. enrichment. Just think about computers and aerospace and biochemistry. You can't *do* them without specialization.

If China, old régime or new, tries to struggle against that, Taipei and Seoul and Singapore — let alone Tokyo — will run 'em ragged. It isn't just a question of diligence or of good ethics or of a reward system.

It's a question of how to expand the universe of discourse, of human knowledge.

I'll certainly accept the idea that Big Science and supercomputers are not unreservedly good and may hurt, or at least not much help, the quality of life. But if you *wont* computers and university research and high-technology weaponry, then the faceless-worker route is not the way to go.

Well, that's enough about social theory. The Gordon article has lots of practical meat as well. It rehearses the list of Chinese digital computers, extending the 1976 paper by Bohdan Szuprowicz. It quotes Lew Branscomb of IBM. It repeats the claim that the PRC will have "ultralarge-scale integrated circuits" by early 1981 (which I doubt very, very much — unless ultralarge means 1K byte instead of 1M byte).

It even talks about Cobol and Fortran compilers. Under development, the Peking people say — and the program Gordon brought back looks like Algol 60.

A fascinating article; wouldn't have missed it for the world. I disagree with some of the computer Interpretations, think the social and political observations arguable (but well worth reading and thinking about). How I wish we could have had, or even right this minute could yet have, a similarly revealing piece on the USSR scene!

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Vague Contracts, Reports Fouled Up System

(Continued from Poge 17)

than general ones, according to the study. This was said to result in "false" deficits and surpluses in departmental cost center reports.

However, the Oct. 7, 1975 report failed to relate its complaints to the concrete terms of the contract; references to particular contracts are unclear. In tracing inadequate service to the departments, the report refers to the November 1974 contract, then to the May 1974 one and then to a February 1974 proposal.

Finally the report quotes an extract that the proposed system "must be responsive to the diverse financial management groups.". Is that extract in the November 1974 implementation contract? It isn't clear.

This is a reporting failure, not the fault of Fics or the contract. For instance, the contract does cover training courses. It states that "the contractor agrees to supply the specific services necessary and required to complete defined segments of Phases II and III of the project."

It agrees to "prepare procedure manuals and source documents necessary to operate the new system." In addition, it consents to "conduct the training programs for operating departments and central departments personnel" to learn how "to operate the system."

But what does the Oct. 7, 1975 report make of these listed obligations? It concentrates on operations problems, rather than on the concrete points of the contract.

It concludes that "training of the city personnel was not complete when system implementation occurred because the procedure and operation manuals were not available for use in training sessions."

Lawyers for Arthur Andersen could react to this statement with a deep yawn and point out that nowhere in the contract does it indicate that you can't train people without the complete manuals. They would be right, too.

Moreover, if they wanted to show you an even better example of what the contract doesn't say, they could point out that the courses only had to be conducted, not prepared by, Arthur Andersen. As far as complaints about course content go, the contract does not even tell who is responsible for that.

Careful Reading Vital

Now, I have no doubt that this isn't what the Detroit people thought the contract meant. They should have realized that while the technical facts were there, the meaning of the contract wasn't entirely clear.

People usually don't read these system consulting contracts to see exactly what obligations the other party must fulfill. This point helps us answer Koslowski's question about Fics.

Arthur Andersen succeeded in supplying a system that the departments found inadequate because people read and sign vague contracts on technical matters without putting in enough effort.

Changing a few words here and there in the contract isn't enough. Sometimes technicians and DP auditors read more into those contract terms than is written. Their experience in reading computer manuals should alert them to the dangers of inattentive reading.

So, to answer Koslowski's question about Fics, the problem, as I see it, relates to the series of vague contracts behind the system. Unclear contracts can lead to severe disagreement between the seller and the buyer of systems assistance.

My question for Koslowski and others is: How can we escape the dilemma of vague contracts?

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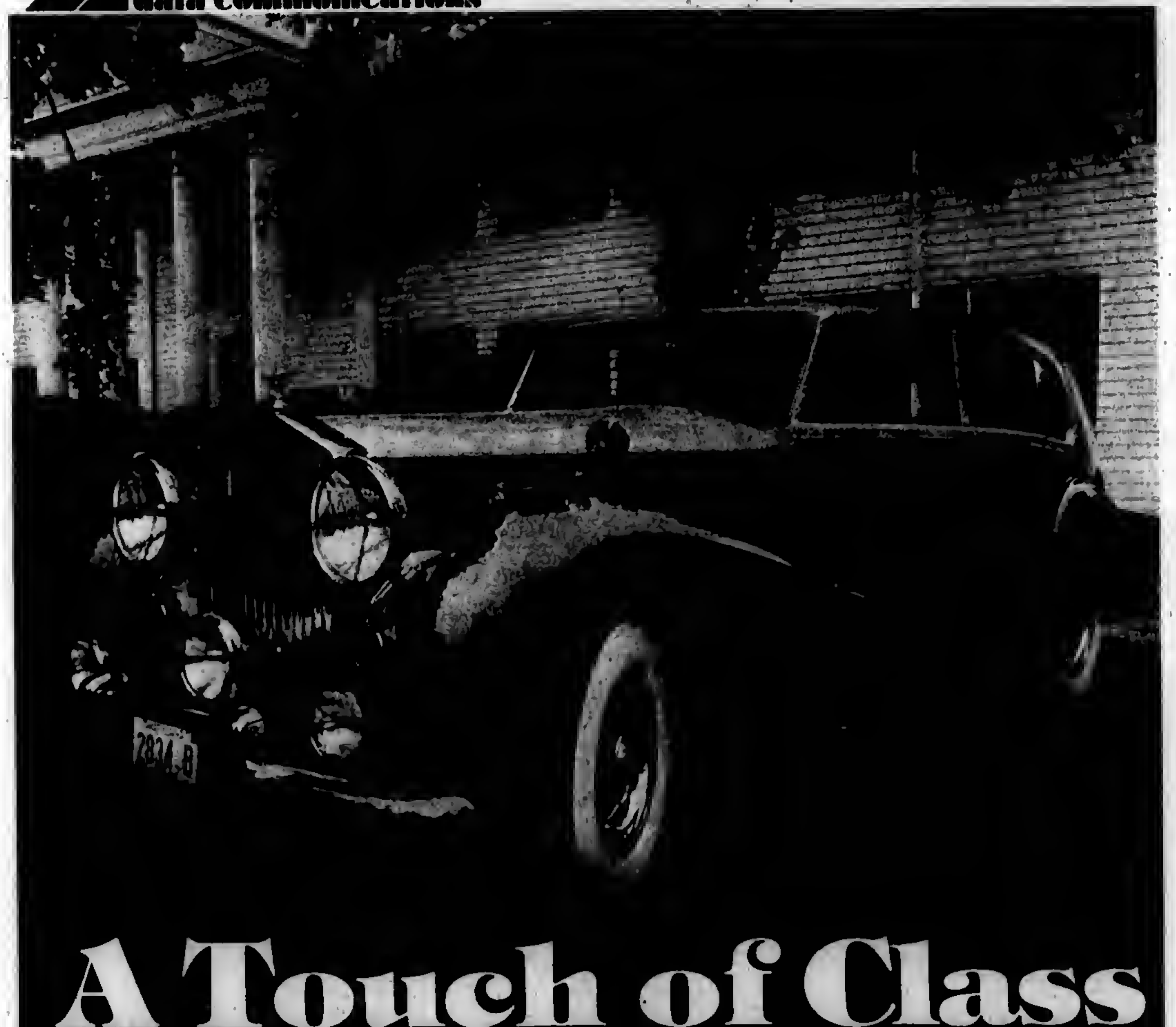

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Letters to the Editor

Seminar Would Be Good Experience

Joan Hendrickson's experience ["Self-Awareness Training Enlivens DPers," CW, Nov. 20] was very interesting.

However, Hendrickson did leave out a most important point: What was the training session she attended?

From the results she saw DPers get in the seminar, all DPers should be interested in attending one. I am.

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'Act Like A Manager'

CPE Only Part of Capacity Planning

By Don Leavitt
CW Staff

SAN FRANCISCO — Computer performance evaluation (CPE) is just one of many skills that must go into the broader multidisciplined management tool known as DP capacity planning. Getting the results of the planning effort to management is the key to that effort's effectiveness, consultant Frances Smith Abernathy said here recently.

Addressing a session of the Computer Measurement Group (CMG) conference at the Fairmont Hotel, she noted that delivering that message can serve two functions. It provides management with meaningful information and gives the planners the visibility they need and an opportunity to exercise non-DP skills.

Even if the measurements behind capacity planning are accurate, they won't be much help to upper management unless those executives are very unusual, Abernathy warned. All the bases of capacity planning must be restated from bytes and microseconds into terms with which the intended audience can be comfortable, she continued.

Units of measure must be no more complex than hours per month of CPU time, with percentages of available total time. "Eliminate all references to mips, megabytes and the like except in the detailed backup information," she counseled.

Reports and recommendations going up the organizational structure should be presented in a thoroughly business-like manner, with a well thought-out format, as well as in a language the ultimate decision makers can understand, she continued.

The results of a study must be summarized into conclusions, recommendations and a recognition of alternatives. Best available cost estimates — including the cost of the no-nothing alternative — must be mentioned, Abernathy said.

CW At CMG

In addition to preparing a written report, the capacity planners should expect and be prepared to make an oral presentation to the decision makers. The presentation should take the form generally used by others communicating with top management, whether this be flip charts, desktop chart packages, overhead projectors or any other media, she said.

"It is little wonder the vendor salesman with his polished flip chart presentation gains more management attention than the typical DPers with their scribbled notes and disorganized thoughts outlined on the back of a punched card," she commented.

If the capacity planners' presentation has the form and quality of presentations made by other professional managers and planners in the organization, the

(Continued on Page 26)

'Argus' Monitors Workloads

By Don Leavitt
CW Staff

SAN FRANCISCO — A mix of established performance-related products, minor and major enhancements and several new offerings, as well as one new vendor, greeted attendees as they entered the commercial exhibit at the recent Computer Measurement Group (CMG) conference here.

The new vendor was Amoco Computer Services Co. (ACS) from Chicago. Its first offering — scheduled for release in mid-1979 — is an MVS monitor package called Argus which the company developed for its own use in support of DP at Standard Oil of Indiana.

Spokesmen for ACS said Argus differs from apparently similar systems because it reports how well the system is performing in terms the end user, not just the DP technician, can understand.

Argus reports show things such as number of requests being serviced and number waiting for service, by cause of wait, rather than CPU utilization, channel busy time and other technical measurements, the spokesman noted.

Other New Products

But ACS wasn't the only vendor with a new product. Pittsburgh-based Duquesne Systems, Inc. used the conference to introduce its Shared Data Set Integrity (SDSI) package which a spokesman described as a generalized multisystem enqueue facility that protects shared data against concurrent updates.

IBM's operating systems do provide an answer to the concurrent update problem, but it isn't a good answer, according to Duquesne. IBM's hard-wired Reserve feature protects an entire volume from all access, whereas SDSI protects just the data being updated and allows everything

(Continued on Page 22)

Honeywell Updates Gcos/64

WALTHAM, Mass. — Release 0400 of the Gcos/64 operating system, coupled with a pair of separately priced enhancements, bring large-scale functionalities to Honeywell, Inc.'s Level 64 medium-scale systems without large-scale overhead, according to a Honeywell spokesman.

The ability to support several operating modes concurrently is one of the chief user benefits of the updated system, he said, pointing to the posssibility of batch and transaction processing and communications support as examples. Even the level of multiprogramming support has been sharply increased, he noted.

The Interactive Operator Facility (IOF) subsystem of the release can be used by itself or as the base for a program development capability that includes a "Multics-like" text editor. Created for the larger Level 68 systems, Multics is a timesharing operating system that protects users from "corruption of concurrently executing programs."

IOF enables the user to interrogate system status, launch jobs and communicate with previously started batch jobs, the spokesman added.

DM-IV Module

The communications capabilities of the Level 64 are enhanced by the extra-cost DM-IV module, which is said to combine the strengths of the TDS/64 transaction-driven system and the IDS-II data base management system. A subset of the DM-IV facilities on Honeywell's Level 66, the new module is a data base/data communications package.

With the module, a fully configured Level 64 can support a communication network of 42 lines with 32 terminals on each line, the spokesman claimed.

Release 0400 is capable of supporting as many as 31 users concurrently when "all necessary resources are present," he said, noting that the previous limit was eight users.

The universal file access system (Ufas), a mainstay of Gcos/64, has been extended to allow access to specific file items by any one of 15 characteristics without a prior sort. Another update provides dynamic file extension, he noted.

While the basic Release 0400 is provided as bundled support, the program development facility within IOF carries a cost of $166/mo and the DM-IV module costs $634/mo.

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'Pims' Handles Leases

CHICAGO — The programming logic to support capital lease accounting under Federal Accounting Standards Board (FASB)-13 has been delivered to a number of users of the Property Information Management System (Pims) from Fortex Data Corp., a spokesman said recently.

The Securities and Exchange Commission (SEC) ruling on required accounting for capital leasing has caused considerable extra effort for publicly held companies with substantial lease activity, he noted, adding he believes the Pims Leasing Option is the first commercially available software that supports both lessee and lessor requirements.

In addition to the FASB-13-oriented leasing option, the package also responds to other external reporting requirements including areas such as Securities and Exchange Commission replacement values, Internal Revenue Service reporting, state income tax information, recalling data for audits and foreign currency conversions, the spokesman noted from 10 S. Riverside Plaza, Chicago, Ill. 60606.

Programmers Must Consider Cobol Performance Flaws: Jalics

CW
At CMG

SAN FRANCISCO — Most programmers have little appreciation of the performance aspects of the programs they are writing, but Associate Professor Paul J. Jalics of Cleveland State University has devised a set of benchmark programs that provide some insights into the subject.

Speaking at the recent Computer Measurement Group (CMG) conference here, he said many users don't give a darn about how well their business-oriented programs perform. If the workload runs too slowly, the installation just gets some more of whatever resource seems appropriate.

He pointed to five reasons for the programmers' lack of concern, adding, however, that he hoped his set of exercises would break part of the pattern. He said, first of all, that programmers typically never have any comprehensive training in the performance considerations of programs.

Today's job reward system usually does not give an incentive for writing programs that give good performance, Jalics continued, and management, in many cases, has little or no idea what time frame is reasonable for a program's execution.

The programmers are usually working in a high-level language such as Cobol and are therefore almost completely shielded from the realities of the sequence of machine instructions that must be executed and the data types that must be manipulated.

Finally, Jalics asserted, the language and compiler manuals "are seldom treasure houses of useful information and hints on how to get the best performance on a particular compiler."

To overcome that background, the professor put together exercises to document the impact of different data types and sizes, table search techniques, subroutine calling overhead and I/O experiments. He also did some work to ascertain the impact of nonaligned data fields in an IBM 370 environment, but felt results were inconclusive.

The data type benchmarks consisted of executing an ADD instruction 50,000 times through a PERFORM loop, working with different data type fields and different lengths in each of 54 experiments. These confirmed that for unsigned fields up to nine digits long, the usage is "by far the fastest, generally three to four times faster than display

(Continued on Page 26)

'Argus' Takes End-User Viewpoint

(Continued from Page 21)

else to be used.

Boole & Babbage, Inc. — from nearby Sunnyvale, Calif. — used its booth space to describe the Comprehensive Management Facility (CMF), which it said provides an integrated approach to both monitoring and reporting of system activity.

The package provides a master monitor around which the user can add the specific measurement tools deemed appropriate in any given instance. It is said to support both long-term trending and intermittent performance analysis.

Personnel from Minneapolis' Comten, Inc. spoke of several existing products, but also of a performance data base support package they expect to have available sometime early next year. As the name suggests, this software enables users — especially those with Comten Dynaprobe hardware monitors — to accumulate historical data for various analyses, the vendor said.

It can be used simply to track past performance, a spokesman noted, or to examine and solve problems in an active system. By enabling users to determine growth patterns, it also lets them project spare capacity and forecast equipment requirements, he claimed.

Range of Presentations

Hardware monitor demonstrations are usually colorful — especially with the on-line, ever-changing display panels now being used — and Comten included some of these in its booth. Computer Resources, Inc. offered much less colorful presentations of its Micromeasure monitor's capabilities, which spokesmen said would provide response time information on as many as four CRTs simultaneously.

Candle Corp. was on hand to tell the CMG attendees about both the Epilog package, which it had introduced in October in the UK [CW, Oct. 30] and its earlier Omegamon monitoring system for MVS installations.

The Cambridge Systems Group devoted its booth space to making the conference goers aware of both the Automated Space Management system 2 (ASM2) and the Extended Compress Facility (ECF). These enhance performance directly rather than merely providing information so technicians can make changes, a spokesman said.

In addition to its new SDSI package, Duquesne told the CMGers about Bytes Transferred Count Option for its older Quantitative Computer Management (QCM) package. The byte count is obtained by summing the appropriate fields of the Channel Control Words (CCWs) executed by the system, Duquesne noted.

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MVS Planning Technique Taking Shape, Technician From Bell Labs Tells Meeting

By Don Leavitt
CW Staff

SAN FRANCISCO — Although capacity planning is one of the toughest problems in managing a large-scale data center — especially if there are multiple modes of operation — a methodology to meet the problem in an IBM MVS environment is beginning to take shape, according to H. Pat Artis.

In a paper that shared the "best paper" award at the recent Computer Measurement Group (CMG) conference here, the computer measurement analyst from Bell Laboratories said the methodology includes five significant steps.

First, he said, it requires developing a concise description of a system's workload at the job step or TSO session level, the IMS transaction level and the job level. But it also requires developing a concise description of the mixes that represent a system's peak utilization periods, he added.

Benchmarking techniques that develop mathematical models relating load, service and utilization are the third step, and identification — from the mathematical models — of utilization levels that represent the system's service-constrained capacity is still another piece of the methodology, according to Artis.

The final step in the procedure is the forecasting of the system's exhaust point in terms of the current workload and good estimates of new applications, Artis said. He also noted that the methodology is currently being implemented in a package known as the Exhaust Point Analyzer and that "several major components" are in use at a "number of installations."

Returning to the step-by-step description of the methodology, Artis said the description of the system's workload at the job step or TSO session level is insensitive to mix and input volume influences and is suitable for benchmarking, forecasting, mix analysis, service analysis and estimation of resource requirements for new applications.

CW At CMG

He continued by noting that a workload description at the IMS transaction level, by those shops using IBM's data base management system (DBMS), is suitable for benchmarking, forecasting, service analysis "and the design of scheduling philosophies for transactions."

The job-level description of a workload eases the development of job class structures and MVS performance groups, he explained.

The descriptions developed for the job steps, TSO sessions and IMS transactions are based on measures of problem activity. To accurately estimate a computer system's capacity, it is necessary to benchmark mixes of the work units to determine the supervisor state utilization, the Bell technician added.

General Program

The benchmarks run under the system Artis described are built around what he called a general benchmark program (GBMP), a synthetic program used to mimic the physical resource requirements and program activities of any specified cluster of workload activity.

An automatic benchmarker was designed to exercise the system by methodically submitting GBMPs to it, and the results — in terms of utilization generated by the synthetic programs — were measured by using the Resource Management Facility (RMF) software monitor that is a part of the MVS environment, Artis said.

Although the developers of the methodology have implemented some of the benchmarking software, Artis acknowledged that benchmarking has only been put in place for batch processing. He blamed difficulties in selecting a suitable remote batch terminal emulator for IMS transactions and TSO sessions for the inability thus far to benchmark those kinds of activities.

'Sibyl/Runner' Aids Forecasts

WELLESLEY, Mass. — A software package for conducting studies of trends, seasonableness and cyclic data patterns is available for time-sharing users of various minicomputers, mainframes or remote computing services from Applied Decision Systems (ADS), a division of the Temple, Barker and Sloane, Inc. management consulting firm.

The Sibyl/Runner software is said to combine more than 20 univariate and multivariate methodologies to permit forecasting and time series analysis from a terminal. Methods include Box-Jenkins, Census, Exponential Smoothing and Adaptive filtering and regression, according to a spokesman.

For operational ease, several programs in the package utilize nonlinear estimation of parameters, he said, adding that users need not have management science or DP experience in order to benefit from the system.

In any case, the statistical content of the programs is documented in user guides and other texts written by program authors Stephen Wheelwright and Spyros Makridakis and published by Wiley and by Holden-Day, the spokesman added.

Written in Basic for use in Hewlett-Packard Co. environments and in Basic-Plus for the Digital Equipment Corp. PDP-11/70, Sibyl/Runner also has been coded in Fortran for IBM, Honeywell, Inc., Burroughs Corp. and Control Data Corp. users.

Source code is available for $10,000, and arrangements to use the programs on a remote computing service can be made by contacting ADS at 15 Walnut St., Wellesley, Mass. 02181.

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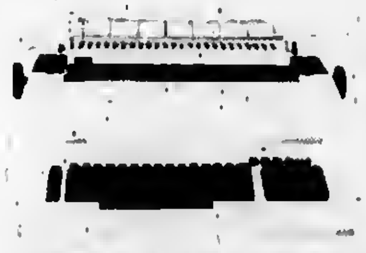

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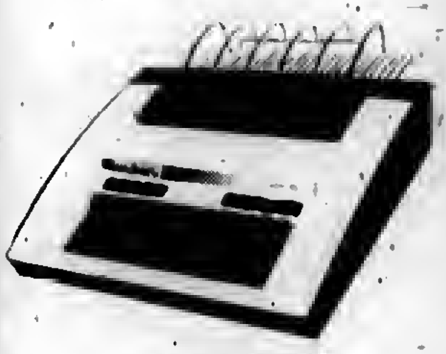

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'Mbasic' Simplifies Use of Univac 1100s

ATHENS, Ga. — An advanced version of Dartmouth Basic, the Mbasic processor for the Univac 1100 series now available from the Cosmic clearinghouse should be useful for technical or management information processing and for scientific and engineering applications, according to a spokesman.

Mbasic has a number of features enabling users to build shorter, more simply structured programs that are easier to read and understand than if they were written in Basic or Fortran, the spokesman claimed.

Contributing to Mbasic's power are its ability to support multiple assignments in a single instruction; conditional, assignment and repetitive statement modifiers; multiple modified statements in a single instruction; and "excellent string handling capabilities."

Five Capabilities

The spokesman also cited a quintet of capabilities that enhance array handling under Mbasic: the assignment of values while dimensioning; matrix algebra written like plain algebra; simple and array expressions in a single instruction; expressions to refer to statement numbers; and the reading and writing of tapes on terminal devices during program execution.

While these features help simplify the program design process, Mbasic's ability to execute any portion of a program even before it is completely assembled enhances other parts of the program development cycle, the spokesman said.

Diagnostic messages pinpoint problems as they appear, and Mbasic's support for resumption of execution after a correction has been made also aids development and maintenance efforts, he added.

The Mbasic processor, developed by the California Institute of Technology's Jet Propulsion Laboratory, is written in Univac Assembler and runs under Exec 8 on 1108 or 1110 mainframes. It requires 36K words plus about 49K words for each user.

Cataloged by Cosmic as program number NPO-13469, the package costs $1,590. Documentation is available separately for $32, the spokesman said from Cosmic's offices at Suite 112, Barrow Hall, University of Georgia, Athens, Ga. 30602.

In UK Jan. 17

Meet to Consider Manager's Role

LONDON — A one-day conference asking the question "Where Does the DP Manager Go From Here?" will be held here at the Cafe Royal on Jan. 17 under the sponsorship of BIS Applied Systems Ltd.

There is a belief — "sometimes expressed as a fear" — that the DP manager is locked into DP, a BIS spokesman said, explaining the rationale behind the meeting. But there are other possibilities, such as upper management or "line" function leadership, and the conference will try to come to grips with some of these prospects, he added.

Chaired by Parry Rogers, director of personnel for the Plessey Co. Ltd., the conference speakers will include Peter Hermon, management services director for British Airways, whose talk is entitled "The Grass Is Not Necessarily Greener Outside DP."

J. Wynford Evans, deputy director of the London Electricity Board, will focus on "Management Services and General Management," while Chairman James R. Porter of Mobil Europe's Mobil Data Services Ltd. will discuss "Personnel Horizons in DP."

Peter Smith, DP general manager for Commercial Union Assurance Co. Ltd., will address the concern of being "Locked in DP," and Brian Doouss, chief executive of Unifreeze Ltd., plans to tell the conference about "Successful Career Development in an International Group."

The registration fee for the conference is about $200, including value-added tax. Additional information is available from Jackie Collings, Course Registrar, BIS DP Training, York House, 199 Westminster Bridge Road, London SE1 7UT, England.

Business Programmers Must Beware of Flaws

(Continued from Page 22)

or Comp-3 types.

"Almost incredibly," however, "the performance of Comp fields over nine digits is the very worst, being seven to 10 times slower than the other two," he said.

Table search techniques tested by Jalics included programmed loops and binary searches, both the SEARCH ALL verb built into Cobol and one that the professor wrote. In the programmed loop, indexing was considerably faster than subscripting, he reported.

"Very surprising" to Jalics was the fact that the binary search via SEARCH ALL is considerably slower for tables with fewer than 52 elements. He blamed overhead built into IBM's library routine for that finding, noting that with a different compiler the SEARCH ALL was faster for tables greater than five elements.

Jalics' own SEARCH BINARY closely mimicked the behavior of the Cobol SEARCH ALL although his outperformed the given logic.

In his work with subroutine calling, he found the external subroutine is typically about 21 times slower than the PERFORM. The overhead of the call, the return, the testing to determine if the loop is finished was blamed for the difference.

CPE Only Part of Planning

(Continued from Page 21)

DP planners' "hidden agenda" — to prove that DPers can be professional managers as well as technicians — will also be achieved, the consultant promised.

Since a significant amount of capital budget money is generally at stake as a result of a computer capacity planning study, "you have the right to executive time and attention, to have your analysis and recommendations heard. Ask for the time you need; get on the official calendar with enough lead time to prepare and rehearse."

Moreover, Abernathy urged her listeners to get to know who from finance and/or corporate planning will be attending the presentation. "Be sure you have talked to them in advance to know whether they will reinforce your position or be hostile."

DP people are "notoriously naive" in the arena of corporate politics, she sighed before adding that for DPers to advance, "the game must be played."

Correction

The Maximus source code generator package [CW, Dec. 4] is now available directly from the developer, Maximus Systems, Inc., P.O. Box 446, E. Aurora, N.Y. 14052, according to a spokesman.

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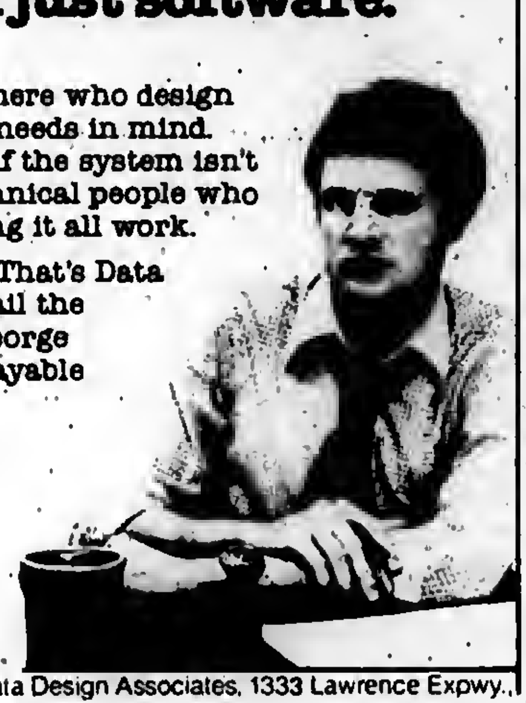

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Fast Updates, Access Called Key to DBMS Use

By Frank Bowater
Special to CW

LONDON — There are few application areas which take better advantage of data base management systems' (DBMS) combination of technical sophistication and ease of use than that of pharmaceutical research. This combination is particularly well appreciated by Beecham, an international consumer products and pharmaceuticals company.

In Beecham Pharmaceuticals' Research Division, vast volumes of data must be recorded and analyzed with great precision by research scientists whose skills are typically more oriented toward biological sciences than computer technology.

The establishment of Beecham's data base system grew out of the needs of the Research Division, which is responsible for the development of both human medicines and animal health products.

The case for introducing a computer-based system stemmed from the work done by the research staff associated with the Clinical Pharmacology Department. The primary function of this group is to evaluate the safety of pharmaceuticals and provide a preliminary assessment of their efficacy for humans. These tasks inevitably involve the handling of large volumes of data relating to toxicity, metabolism and other factors.

The first priority was to design a system that could automatically acquire data from studies on new compounds. This was particularly important because Beecham has both a medical and legal obligation to record this data accurately and in a way that is readily retrievable.

Because this data is voluminous and has been accumulated from studies undertaken over several years, highly qualified staff members were spending much of their time recording and analyzing data to meet the reporting obligations.

The initial implementation of the computer system was concerned with the automation of data input. A turnkey system was installed with electronic balances and autoanalyzers connected to a Digital Equipment Corp. PDP-11/34 minicomputer.

Each balance, together with a CRT terminal, is placed on a trolley that can be moved to the study area to allow the interactive entry of research data. Clinical chemistry data is fed directly into the computer from several channels of autoanalyzers.

When the PDP-11/34 receives data, it records the readings on disk together with the identification necessary to relate them to the various studies. Data is accumulated during the course of the day and then transmitted over the switched public network to an IBM 370/158 at Beecham headquarters here, where it is validated by Ramis II, the DBMS from Mathematica, Inc., and used to update the department's data base.

These procedures — data acquisition with the PDP-11/34 at Harlow, one of the company's research centers, and processing by the central DBMS which will serve a number of other research sites that need access to this data — are the heart of the system. Medical information from some company sites will also be processed and doctors will be able to interrogate study data via terminals at a later stage.

Beecham attributes the success of the data storage and retrieval aspect of the project to its relative simplicity. A DBMS that used conventional procedural programming languages could not have filled our needs because we required a system that could be operated in large part by people without computer backgrounds.

With the system's nonprocedural report writing language, the user can specify, in simple English-like statements, what it is he wants to do. Data retrieval paths are generated based on the data names in the request, and sorting and formatting are handled automatically unless we choose to override these functions.

Beecham's research staff has adapted very quickly to the system. After the basic training, they required very little help in terms of producing day-to-day procedures.

Having learned the Ramis II language, the scientists manipulated test file data on a three-month trial basis. Simple procedures established at the outset were replaced by more complex procedures as the staff gained in experience and expertise.

Beecham was able to implement the mini-based turnkey system with a minimum of effort on the part of program-

(Continued on Page 29)

Conferences, Tutorials Scheduled by Infotech

PASADENA, Calif. — Infotech International, Inc. will offer a series of "State of the Art Conferences and Tutorials" early next year. In each case, a three-day conference will be followed by a separate but often related two-day tutorial that provides the potential for a full week program, a spokesman noted.

In San Francisco, for example, a conference on "IBM — The Next Five Years" will run March 5-7 under the chairmanship of Dr. Herbert R.J. Grosch, former president of the Association for Computing Machinery. Grosch's panel will include William Easterbrook of Kidder Peabody, journalist Rex Malik, Ulri Weil of Morgan Stanley and independent consultant Stephan Robinson, among others.

Then Howard Frank of Network Analysis Corp. will lead a tutorial on IBM's Systems Network Architecture (SNA) and "Packet Switching — Today and Tomorrow" on March 8-9.

A conference looking "Beyond Structured Programming" — chaired by Les Belady of IBM Yorktown Heights — has been scheduled for Washington, D.C., April 23-25; its companion tutorial session will be led by Ed Daly of GTE in Chicago and will focus on successful software management.

The series returns to San Francisco May 7-9 for a conference on "Data Base — The Next Five Years," directed by Sjir Nijssen of Control Data Corp. He will also chair a tutorial on information analysis May 10-11.

Moving to the Midwest, the convergence of computers, communications, and office automation will be discussed in Chicago June 18-20 under the leadership of Howard Morgan of the University of Pennsylvania's Wharton School. This will be followed by a tutorial on the office of the future, led by Morgan and Mike Zisman of MIT's Sloan School of Management.

Each of the conferences has an individual registration fee of $750; the shorter tutorials cost $500 per person. Discounts are available for multiple registrations from the same organization at any given meeting, the Infotech spokesman noted from 234 E. Colorado Blvd., Pasadena, Calif. 91101.

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Update, Access Ease Called DBMS Keys

(Continued from Page 28)

ming and systems staff. The need for central storage was apparent from the requirement to access the data from several sites.

An important objective was to produce reports from the data base that could be directly incorporated into submissions to the regulatory agencies for new medicines. As each report has a different format, and with in-house resources heavily committed, it was clear a system could not be designed in an acceptable time scale.

Initially, the idea was to only collect the information at Harlow, where the Research Division is based, with further calculations and the preparation of reports done outside the computer system. This, however, would have provided little, if any, alleviation of the load on the research staff. It was therefore decided to look at packages that were available.

After an across-the-board look at DBMS packages, two were singled out because they were already being used for similar work in the U.S. Key criteria were that the DBMS had to be a complete user system; it had to be simple to define a structure for storing data, and it had to avoid complicated procedures. It was also important that straightforward English-like statements could be used by scientists to select the required information.

Reasons for Acquisition

Beecham decided to acquire Ramis II for a number of reasons, not the least of which was the desire for reliable local technical support. Beecham regarded a sound training program, good documentation and competent technicians who could speedily resolve problems to be essential.

Among other reasons for choosing Ramis II were those frequently cited by other DBMS clients: ease of use by nonprogrammers, ease of implementation, a commitment by the vendor to adapt to possible changes in the IBM operating system, ongoing enhancements of the product and the ability to interface with other systems.

It is believed that, on the commercial side, Beecham will also benefit from the capabilities now available through Ramis II which allow the implementation of several applications that would otherwise have to be low priority.

Bowater is international systems manager at Beecham in London.

'Medi Syst' Runs Under Dibex

W. CALDWELL, N.J. — The Medical Billing and Information System (Medi Syst) package from Information Access Systems, Inc. (IAS) uses the company's Dibex virtual memory operating system on Digital Equipment Corp. PDP-11s or LSI-11s to support a group practice, clinic or sole practitioner.

Described as modular, Medi Syst is centered on 107 programs that encompass third-party billing, accounts receivable, billing history and cash receipts applications. The central module also supports file inquiry, reporting, program control and file maintenance operations, a spokesman said.

While a conversational mode of instructing the operator simplifies the human interface with the system, Medi Syst's use of Dibex allows the organization to gain up to 40% better hardware utilization than it would have with a DEC-supplied operating system, the spokesman claimed.

The Medi Syst package, including Dibex, can be acquired for $15,000. An appointment scheduling module costs an additional $1,000, while inventory control costs $1,500 and a general ledger module, $2,000.

IAS is at 1140 Bloomfield Ave., W. Caldwell, N.J. 07006.

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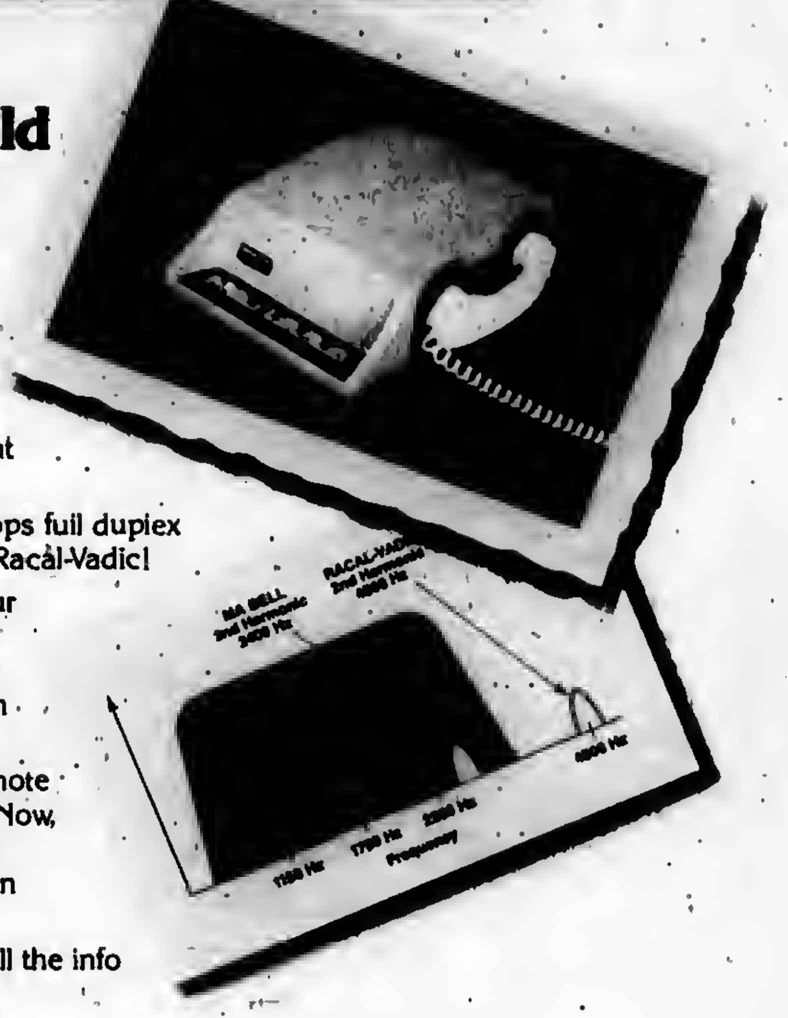
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This wise choice of frequencies has made possible a 1200 bps full duplex acoustic coupler—the VA3434, which is now in full production at Racal-Vadic!

Why in the world, Ma, did you reverse the frequencies in your 212A? By transmitting at 1200 Hz and receiving at 2400 Hz, the 2nd harmonic of your transmitted signal falls right in the middle of the received signal, making the design of an acoustic coupled 212A an engineer's nightmare.

So Racal-Vadic has done it again, Ma. The real winners are remote terminal users who no longer have to settle for 300 bps operation. Now, merely by replacing their present coupler with the VA3434, they can operate at 1200 bps full duplex, while retaining the portability that an acoustic coupler provides.

Suggest that you phone or write Racal-Vadic today, Ma, for all the info on the VA3434 1200 bps full duplex acoustic coupler.

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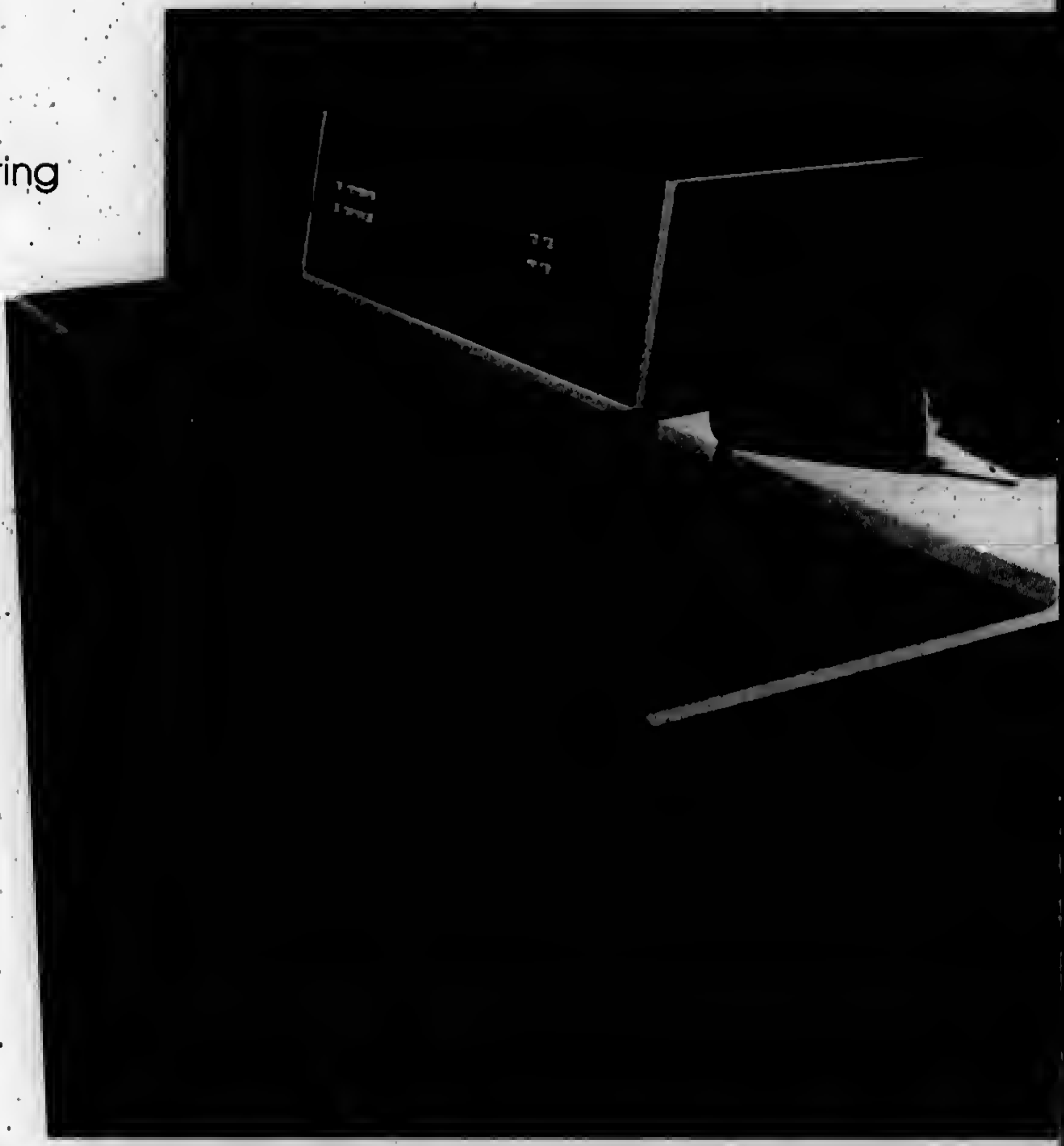

Consider the operating cost of the Kodak laser printer versus the operating cost of a paper-impact printer.

Consider, for example, the cost of generating a 1000-page, 3-copy report.

Three-part stock paper costs about $22.30* per 1000 pages. But you can put the same report on microfiche for around $1.50.

So, from the standpoint of materials alone, paper is about 15 times more expensive than microfilm.

Time and labor costs are important factors, too. Especially in a DP department. Which is why you should know that it would take almost 50 minutes to decollate, burst, bind and package a 1000-page report. It would take only 9 minutes to print, duplicate and package the same report on just 4 microfiche.

A Kodak laser printer can save you money in other ways, too. With a paper printer, you'd have to load at least 12 boxes of paper to print the equivalent of one cartridge of 16-mm film. Compared with fiche, the margin of difference is even wider. You'd need 31 boxes of paper to print the equivalent of one fiche cartridge.

87% cheaper.

In fact, when you add up the savings in materials and labor, you'll find that printing with a Kodak Komstar laser printer is about 87% cheaper overall than printing with a paper-impact printer.

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Instead of Smart Terminals

Insurer Applies Word Processing in Net

By Ronald A. Frank
CW Staff

TORONTO — Can a word processing system be used in place of intelligent terminals in a transaction-oriented network? Emphatically so, according to Kelly Butt, director of DP facilities at Manufacturers Life Insurance Co. (Manulife).

The Manulife DP center here handles requests for policy proposal from the company's branches which include 44 locations in the U.S. Until recently these branches were connected to the DP center via Wats lines in the U.S. and foreign exchange (FX) lines in Canada, Butt explained.

The network operated with General Electric Co. Terminet 300 teleprinters transmitting at 300 bit/sec. When an office requested that a proposal for insurance coverage be generated on the firm's Amdahl Corp. 470V/6, it usually meant that an answer could not be transmitted until the following day, she said.

In addition to the policy proposal application, an administrative message system and management reports were being transmitted with the Terminet network.

To keep up with its competitors, Manulife wanted to be able to respond faster to requests for proposals from the remote offices. Butt knew that to implement this goal the terminal equipment would have to be upgraded.

After evaluating several types of terminals, she decided the best system for the application requirements was the Digital Equipment Corp. WD 200 word processing system. When Butt proposed this solution to DEC, company marketing people were not enthusiastic.

They were not sure the WD 200 would work in the transaction-oriented insurance environment; Butt had to persuade the DEC people the plan would work.

Network Alternative

Once the equipment was selected, the next goal was to find a network alternative to the Wats/FX combination. After studylng the traffic flow patterns on the network, it became obvious that the transactions had low-volume input with medium-volume output. The best solution for this type of data traffic was a packet-switched capability, she noted.

Butt decided to use Telenet Communications Corp.'s facilities in the U.S. while operating on the Datapac net in Canada. The first WD 200 systems are now in operation, and there are some obvious benefits.

First, the floppy disk storage in the word processing systems give each branch the capability to edit or customize a policy proposal when it is transmitted back from the Amdahl mainframe. And the buffer capability of the remote systems makes it possible to get answers to the branches the same day.

If an operator is not available at a particular system, the output is merely transmitted into local storage and printed out when needed by branch personnel, Butt explained.

With the more intelligent equipment, it will be possible to expand into an electronic mail system in the near future. Other applica-

(Continued on Page 32)

Node Packetizes Extensions Of Public Packet Networks

LOS ALTOS, Calif. — Intelligent Terminals, Inc. has unveiled a packetizing network node for use in terminal network complexes.

The Added, Advanced Capacity and Capability (Adcap) node uses advanced multimicroprocessor and microprogrammable control techniques implemented with LSI components and was designed for use as a building block in low-cost packet-switched networks, the vendor said.

Adcap can be implemented for use in conjunction with a multiplexer, an existing front end or a host to packetize private extensions of public networks. The equipment handles up to 56k bit/sec on the network side and 9,600 bit/sec on the terminal side, the firm said.

The Adcap processor operates between the terminal and the network to translate the terminal output into a format required by the packet network. At a host CPU site, the Adcap unit operates between the network and the front end or CPU. It translates the network formatted data into the format required for compatibility with the mainframe, a spokesman said.

The device can also be used in ring networks where transmission takes place between terminals without interfacing to a mainframe. Such operations would require private lines since public data nets currently available require interaction with a CPU from a terminal.

Adcap provides an optional satellite buffer of 64K bytes; compatibility with X.25 and other standard protocols; and data compression. For high security applications, Adcap offers optional National Bureau of Standards 56-bit encryption capabilities.

Full Transparency

Adcap provides code independence (APL, Ascii, BCD, Ebcdic, IBM correspondence and so on). Full transparency eliminates the need for software changes. Communications discipline independence with switchable multidisciplines permits substantial reduction in the number of modems and lines in an existing network. Further, Adcap offers a shared intelligence to dumb terminals operating through the unit, the company said.

Providing high levels of network modularity, error-free data and higher capacity for existing data lines, Adcap is particularly useful in private extensions of public networks such as Tymnet and Telenet and offers low-cost enhancement of existing network technology, Intelligent Terminals said.

The Adcap processor can handle a mix of different terminals on the same network.

A four-channel version of the Adcap processor with required software costs $5,000 with delivery in 30 days from Intelligent Terminals, Inc., One First Street, Los Altos, Calif, 94022.

Seminar to Cover International Nets

MONTCLAIR, N.J. — Telecom Systems Group, Inc. will hold a three-day seminar entitled "Designing, Installing and Managing an International Telecommunications Private User Network."

The seminar will concentrate on technical, tariff and regulatory information the telecommunications user requires for international corporate networks.

The course covers a new concept in the operation of a network in the form of an in-house user telecommunications utility. Functional components, pricing policy, traffic handling capabilities, cost justification and other attributes of such a utility will be discussed. The course will also include three detailed case studies in the development of a private user international telecommunications network, Telecom said.

During the first half of 1979 the course will be presented in three U.S. and three overseas cities: Washington, D.C., Denver, San Francisco, London, Amsterdam and Hong Kong. Instructors will be Leonard Elfenbein and Clark Okun, both with Telecom Systems Group.

Details are available from Telecom Systems Group, Inc., 181 Upper Montclair Ave., Montclair, N.J. 07042.

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Unit Tests Polling Performance of Modems

LINCOLN, R.I. — International Data Sciences, Inc. is offering a microprocessor-based unit designed to test the polling performance of asynchronous and synchronous modems.

The Model 1700 polling tester can be used to test modems over simulated or actual switched networks, private-line point-to-point networks or private-line multidrop networks, according to a spokesman.

To reduce downtime and improve maintenance efficiency, the Model 1700 can perform polling tests of on-line data communications equipment to isolate faults and verify acceptable system performance. As an aid in targeting system malfunctions, it distinguishes between outbound and inbound polling message errors and permits the injection of those message errors to verify data network continuity, the vendor explained.

As Remote Unit

As a remote unit, the Model 1700 can be configured to allow for environmentally hazardous or high-level security situations. Fast or slow polling responses are selectable at the master polling tester. Fast polling operation is more representative of on-line system operation, while slow polling permits test personnel to observe front panel indicators and the audible alarm feature to monitor system performance, the spokesman said.

The Model 1700 is priced at $1,800. Delivery is 60 days from International Data Sciences, at 7 Wellington Road, Lincoln, R.I. 02865.

Insurer Upgrades Net

(Continued from Page 31)

tions are being considered, she added.

The Terminet units cost Manulife about $265/mo. Although she would not quote an exact figure on the WD 200 systems, Butt said her monthly equipment cost is now about $200 higher.

The increased capabilities of the terminal (word processing) equipment have more than made up for the increased costs, and these benefits will really be appreciated when additional applications are implemented on the network, Butt explained.

The entire network will be in operation with the upgraded equipment in January, with a phasing in of electronic mail and other applications.

Transparent Conversion

Telenet was chosen over Tymnet, Inc. because it served more of the branch sites that had to be connected to the network, she said. The WD 200 systems operate in teletypewriter mode, but this is translated into X.25 format for transmission on the Telenet and Datapac nets. The conversion is completely transparent to the user.

At the DP center here, the 470V/6 operates with the Intercomm software system from Informatics, Inc. The CPU has an IBM 3705 that operates with Dmep software, which converts the X.25 data stream from the Datapac net into a machine-compatible format.

Canadian branches are also tied to the mainframe here with Datacom 600 teleprinters supplied by Bell Canada. The teleprinters emulate IBM 2740 Model 2 format for compatibility with the mainframe. The Canadian terminals operate on the Dataroute network, which is the private-line system offered by Bell Canada.

After all 44 U.S. sites are operating on the new network, the traffic volume will have to be evaluated. One option would be to increase the network speed to 1,200 bit/sec, if volume warranted such a step, she explained.

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Teleprinter Turns Out 180 Char./Sec

OTTAWA — The Datacom 1200 family of teleprinters has been introduced by the Computer Communications Group (CCG).

Available as a receive-only (RO) terminal or equipped with a keyboard, Datacom 1200 prints bidirectionally at a maximum speed of 180 char./sec and produces up to 132 char./line.

Vucom Output

Supplied by Digital Equipment Corp., the Datacom 1200 receive-only teleprinter can serve as a hard-copy output device for the Vucom 1, 3 and 4 series of CRTs, as a peripheral printer for mini- and microcomputer systems and for remote multicopy printing from a host data base in a stand-alone configuration.

Rates for the Datacom 1200 in Canada are $2,715 for the RO model, with an additional $150 for the keyboard send-receive version. Filed rental rates, which are subject to regulatory approval, are $146/mo for the RO model, with an additional $7/mo for the KSR unit. Maintenance costs $44/mo.

It is expected that rental tariffs will be approved by mid-January, a Bell Canada spokesman said.

Modem Family Runs With Integral DAA

PALO ALTO, Calif. — A family of modems from Prentice Corp. allows transmission of 300 bit/sec data over the dial-up switched telephone network without an external data access arrangement (DAA).

The family consists of the P103J originate/auto answer, P113C originate and P113D auto answer data sets. These replace the Bell 103J, 113C and 113D modems, respectively, and are end-to-end compatible with the Prentice P113A/B and the Bell 113A/B and 212A.

The data sets have a standard RS-232C digital interface and a telephone interface defined by Federal Communications Commission Part 68, the company said.

The P103J, P113C and P113D provide half- or full-duplex transmission and reception of serial binary asynchronous data over two-wire, dial-up telephone facilities. An integral DAA with solid-state switching allows direct connection of the modems to the switched telephone network.

The three data sets feature built-in diagnostics with front-panel LED status indicators that monitor up to nine conditions and parameters, front-panel jacks for establishing busy out, local digital loopback and local analog loopback conditions and switch-selectable options.

The 103J costs $530, the 113C, $405 and the 113D, $415 from Prentice Corp. at 795 San Antonio Road, Palo Alto, Calif. 94303.

'Inertial Guidance Systems Are Not Supposed to Be "Cute," Murdock.'

PROBLEM:

WESTLAW is West Publishing Company's answer to a lawyer's plea.

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Ironically, WESTLAW's far-reaching success posed a problem: could data communications keep pace with its rapid growth coast to coast?

Before adding full text printouts to the service, for example, West wanted to be sure that lines and terminals could handle the longer messages efficiently.

Also, they did not want the expected surge in demand to slow down their almost instant response to inquiries.

The problem was data communications. The solution came from the Bell System.

SOLUTION:

The case for the Bell System solution was made on the basis of astute total systems planning and two Bell innovations.

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Second is Bell's newest Dataspeed® terminal—keyboard, display unit, and high-speed printer—now used by WESTLAW subscribers.

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This combination plus Bell's continuing on-the-spot involvement have prompted West to look at still other ways to take full advantage of the Bell solution.

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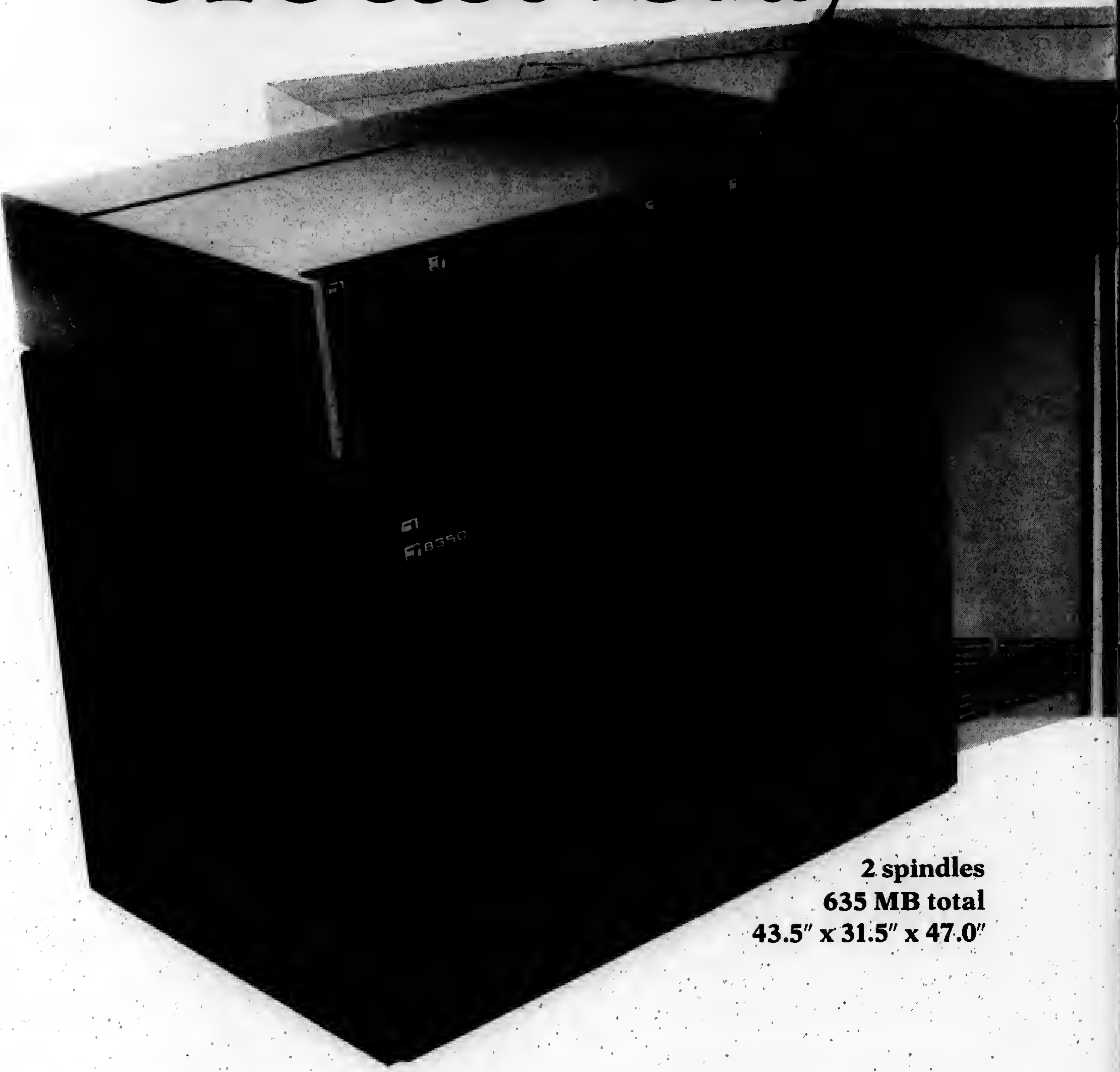

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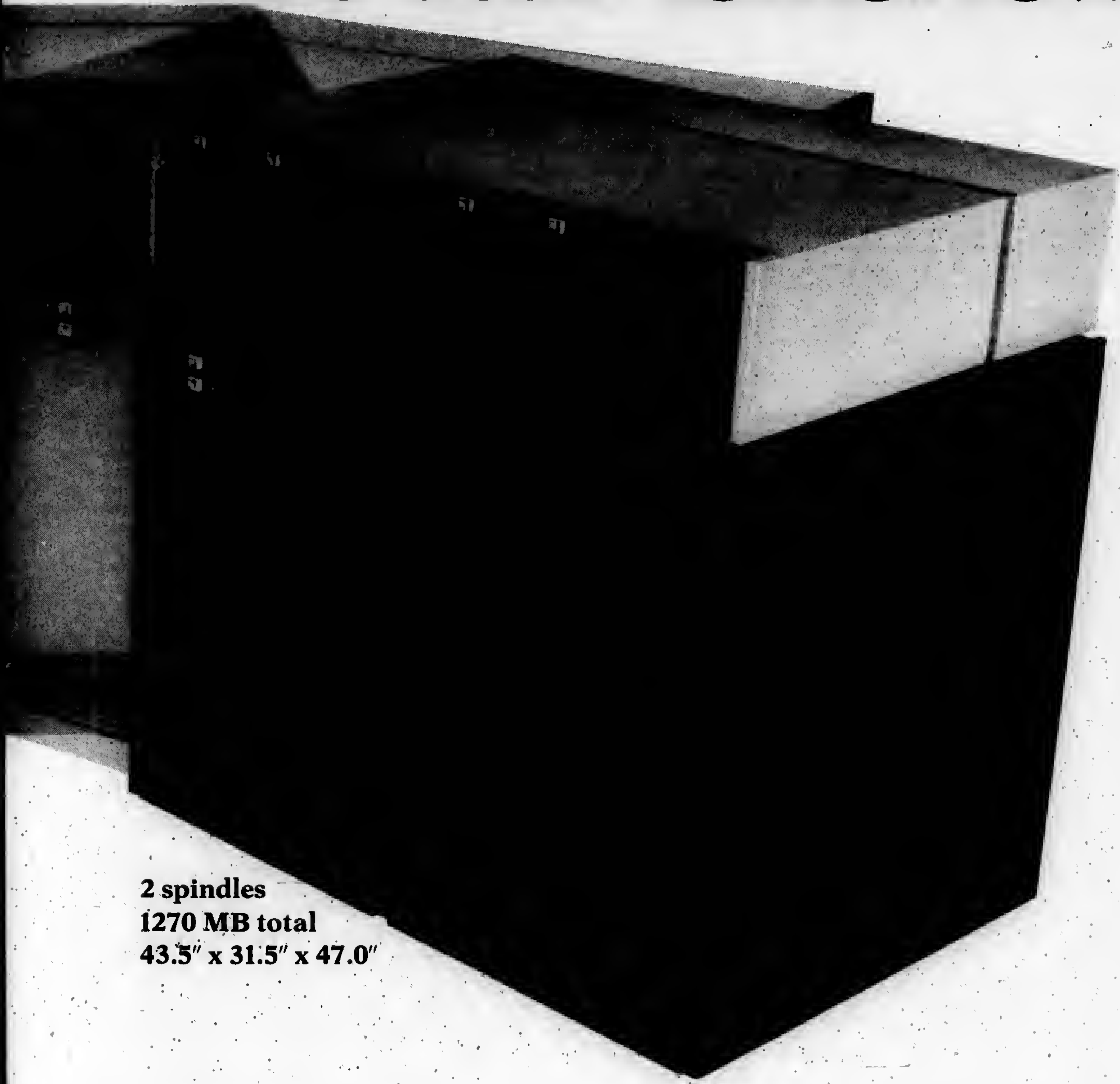
When we designed the 8650, we also designed a logical growth path for 8350 users: your unit can be upgraded to 8650 specifications whenever expanding data storage needs dictate doubling capacity. On your site, and at a very reasonable cost. That's why owning an STC 8350 today will be like money in the bank tomorrow.

How we achieved Double Density. The 8650 is a natural outgrowth of our experience in the research, design and manufacturing of high-performance fixed media disk systems. The 8650 double density disk drive, like the proven 8350, is an evolutionary product of our continuing research in winchester technology. It incorporates all that we've learned about head/disk relationships, flight dynamics, servo mechanisms and magnetic materials while becoming the leading independent supplier of fixed media disk. This knowledge, coupled with the STC certification process of stringent testing and inspection, has

STC 8650 Tomorrow



2 spindles
1270 MB total
43.5″ x 31.5″ x 47.0″

enabled us to make double density a reality.

The STC 8650 is completely compatible with 3350 software support, and access time is equal to or better than a 3350. But that's where the similarities end. Our new head design improves read/write reliability at the new tighter track spacing. A newly designed servo system minimizes seek time and enhances data tracking accuracy.

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For Data Entry, Communications

RS-232 Terminal Attachments Add Intelligence

ROCHESTER, N.Y. – Additional intelligence to enhance data entry and communications is featured by two additions to Sykes Datatronics, Inc.'s Comm-Stor family of terminal attachments, the vendor said.

Comm-Stor III requires no intelligence in the user's terminal and employs an internal microprocessor to provide all the intelligence necessary for forms data entry, validation, diskette storage and data transmission, Sykes declared.

For attachment to asynchronous RS-232 terminals, Comm-Stor III is primarily intended for source data entry of documents, the vendor noted. Such documents would include sales orders, job reports, freight weighbills, insurance claims, tax forms and registrations.

Data on diskette can reportedly be automatically converted by Comm-Stor III to the IBM 3740 Data Exchange Format for immediate entry into IBM systems.

Comm-Star III's featured firmware is said to allow arithmetic operations up to 16 digits, automatic table lookup and fill-in data fields, data range checking, validation of all data entered and user-defined forms layouts.

The unit has communications ports for connection to a local terminal and modem and a third port is optional for connecting the unit to a local printer. A total of 12K bytes of random-access memory (RAM) is available for user forms storage, and either a single or dual floppy diskette drive may be selected.

For Distributed Environment

Comm-Stor III benefits for on-line users who have distributed terminals connected to a central processor. Forms data entry work may be off-loaded from the CPU to the local terminal, thus freeing the CPU to do other work and permitting local operation of the terminal on an independent basis, according to a Sykes spokesman.

Input can be stored off-line for local use and, in cases when the central computer or communications line goes down, local operations can continue, the spokesman added.

Comm-Stor III was further said to treat all information entered as a whole form, whereas data entry is on a line-by-line basis with conventional hard-copy terminals.

Sykes' Comm-Stor IV is a Basic-programmable terminal attachment that includes, in addition to the Basic command set, a second command set of data communications and file management functions. These sets "tremendously" simplify programming data entry, storage and transmission applications, the firm claimed.

The Comm-Stor IV features either a single or dual floppy diskette drive, from 4K to 40K bytes of user program memory and communications ports for connection to an asynchronous RS-232 terminal, printer and modem.

The Extended Basic interpreter, file manager and data communications system are all resident as firmware in an additional 40K bytes of read-only memory (ROM), the vendor explained.

To accommodate special devices, binary data may be entered from either the terminal or modem ports without the need for delimiter or control codes. To aid the OEM who delivers systems with turnkey software, a feature within Comm-Stor IV protects this software from end-user access or inadvertent change, the spokesman said.

Other Comm-Stor IV features include input data buffering, real-time clock, virtual arrays, CALL and LINK programs, up to seven interrupt levels and IBM 3740 data exchange.

File Management

Comm-Stor IV's file management system "does all the work" behind sorting, storing and retrieving data, Sykes maintained. After receiving data from a terminal at low speed, an unattended Comm-Stor IV can send batched data at high speeds over communications lines and can interact with most asynchronous communications protocols, it added.

Comm-Stor users have a choice of four file access techniques: sequential file access; sequential with random repositioning; random file access; and physical track/sector access.

With Comm-Stor IV, the operating system is resident in ROM, eliminating the need to load system software, subroutines, overlays or bootstrapping programs from diskettes, the Sykes spokesman added.

For real-time applications, data input to the terminal and the modem ports is automatically buffered and held until a Basic program requests it, he continued. Each port is assigned a buffer area of up to 32K characters, with the combined two-port buffer maximum of 40K characters.

Comm-Stor IV also provides full support of virtual arrays, the spokesman stated, noting that, unlike regular arrays, the values of the virtual array are stored on diskette. As a result, there is reportedly no need to program file handling routines, and no READ statements are required for data access.

A single-drive Comm-Stor III with 5K RAM costs $3,375. A minimum configuration Comm-Stor IV – consisting of a single diskette drive, 4K memory and two ports – costs $4,000, Sykes said from 375 Orchard St., Rochester, N.Y. 14606.

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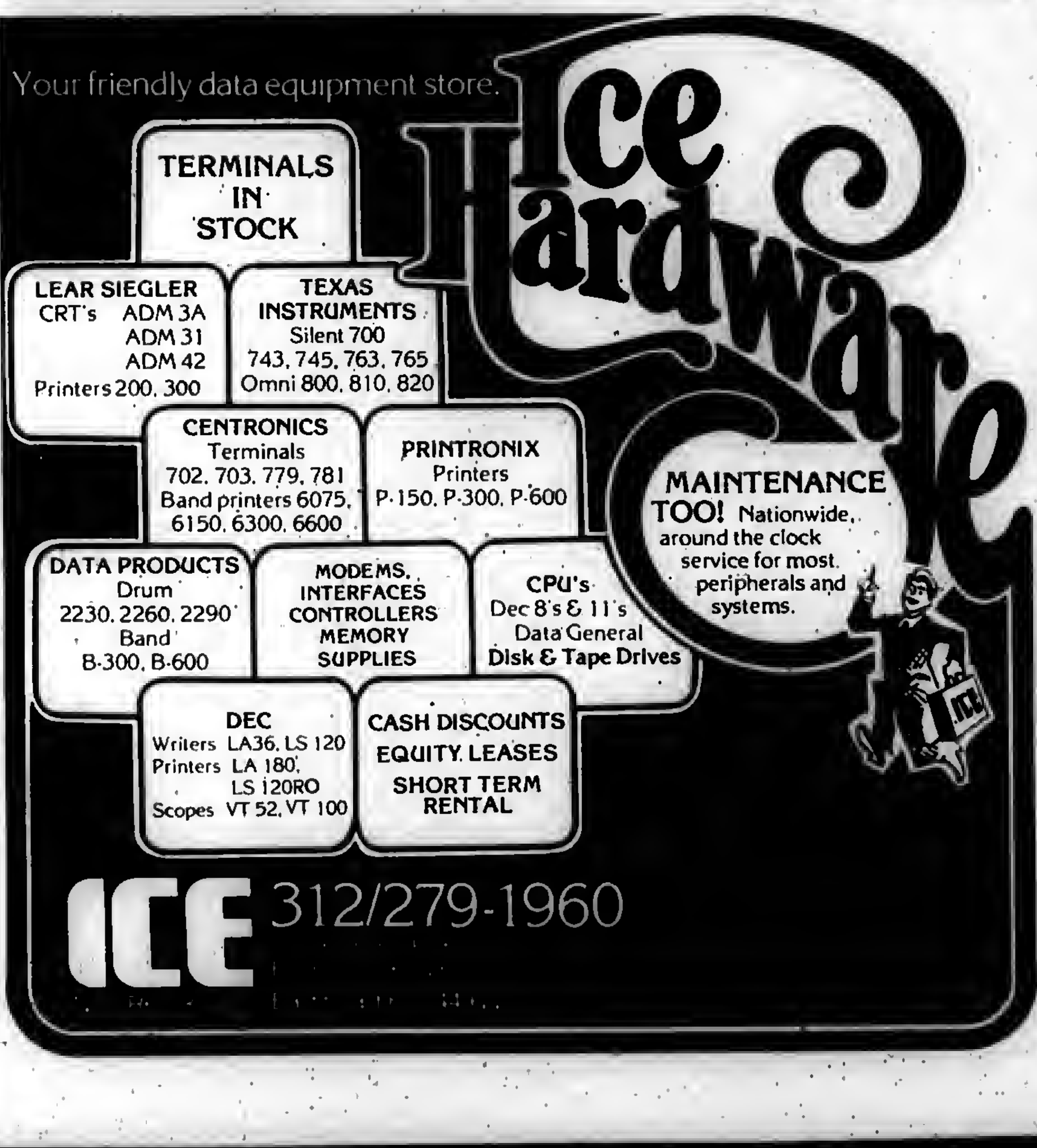

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Terminal Emulates VT52 Code Structure

ANN ARBOR, Mich. – Ann Arbor Terminals, Inc. has announced the Model VT52-Compat, a terminal that reportedly emulates the code structure and functions of Digital Equipment Corp.'s VT52.

The unit offers a 15-in. nonglare screen, compact size and detachable keyboard. There is no repeat key since all keys are automatic and no control switches since all operating controls are set from the keyboard, according to a spokesman.

The unit displays 24 lines of 80 characters, upper and lower case. Characters are formed in a 7 by 7 dot matrix in a 10 by 10 dot field. The cursor is a blinking field.

The model VT52-Compat includes an 81-key detachable keyboard that generates the full 128-character Ascii set. A separate numeric pad and cursor control keys are standard.

Use of the Shift, Control and Caps Lock keys is identical to DEC's VT52, the spokesman said. Up to 28 additional special function keys are available.

Available options include export power, current-loop interface and rack-mounting panel, as well as a variety of case options. Prices begin at $1,400. Ann Arbor Terminals is at 6107 Jackson Road, Ann Arbor, Mich. 48103.

One Proposed by Univac

Ansi Mulling Two Interface Standards

By Jay Woodruff
CW Staff

WASHINGTON, D.C. — The American National Standards Institute (Ansi) is meeting this month to consider two similar proposals for a low-level interface standard that could reduce the complexity of linking processors, channels and peripherals. If Ansi decides to adopt one of the proposals or a combination of the two, the decision will form the basis of a national standard.

"We are trying to boil them down to a single proposal," according to Delbert Schumacker, chairman of Ansi's X3T9 standards committee. Both proposals were discussed in a special November meeting here.

The first proposal was introduced in the early part of the year by X3T9.2 Standards Subcommittee Chairman Robert Fink of Lawrence Berkeley Laboratory and by Ansi members from the Los Alamos Laboratory and Hewlett-Packard Co., among others.

In an October Ansi meeting in New Orleans, Univac introduced its own proposal for the standard, taking what Univac's Floyd Ross, also a X3T9.2 member, called "an aggressive position in the Ansi Input/-Output Standards Committee."

Univac called its proposal, now under development at the company, the Data Bus (D-Bus) Interface. It employs a Programmable Interface Unit (PIU), an LSI device which is programmable by the system, reducing the amount of external logic needed to connect system components, Ross said.

Ross admitted the two proposals are basically the same and meet the same requirements. "There isn't much room for difference," he said. "It's like the similarity between a mid-sized Chevrolet and a mid-sized Ford."

The biggest advantage of the Univac proposal, Ross said, is that "our proposal is tested and running" and is available "off the shelf."

Univac is "several years down the road" on the project, he added. "The other proposal was not as far along in implementation."

The Univac effort began before requirements for the standard were written, he noted.

Other advantages of Univac's proposed standard lie in its flexibility, which allows it to be used with a variety of components, and in its size, which makes it easier for the user to place conveniently, he maintained.

"The surprising thing, from the Univac perspective, is that we offered a standard at

(Continued on Page 46)

Magnuson M80/4's First User Finds It Cheaper Than T/S Net

By Jay Woodruff
CW Staff

LEXINGTON, Mass. — When Mitrol, Inc., a software developer, looked at the cost of buying time-sharing services so it could handle a new client's account, it found those services would cost as much as a computer. So it bought its own computer instead.

"We bought this machine primarily to develop a company in Sweden," according to Mitrol's treasurer, Bruce Adler. "To do this special project at a service bureau would have cost as much as a computer. And we are not doing as much development work as we wanted because of the cost of time-sharing."

Mitrol installed a 2M-byte Magnuson Systems Corp. M80/4 in the beginning of October, becoming that system's first user. The unit is IBM-compatible and is most similar to the IBM 370/148 [CW, May 22].

Cost, performance and speed were the factors that made the Magnuson system attractive to Mitrol, according to Arthur Goff, Mitrol's DP manager.The difference in cost between a Model 148 at $658,000 and the M80/4 at just under $400,000 played a big part in the decision to buy the newer machine, he said.

Mitrol did not completely foresake time-sharing services after it bought its own system. It had been using a service bureau's time-sharing system for on-line program development, its own business functions and for running its clients' programs.

Some program development and business functions were moved to the in-house system, but the bureau still runs programs for the software developer's customers, and it is used for much of Mitrol's software development.

Goff said the transition from the service bureau to an in-house system was accomplished smoothly, and the company has experienced no problems. Hardware and soft-

(Continued on Page 38)

Experimental Technology Boosts Circuit Density of Chips Tenfold

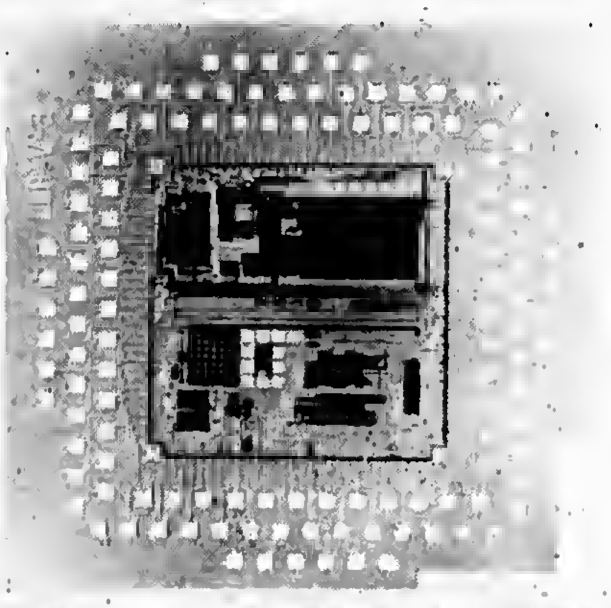
By a CW Staff Writer

WASHINGTON, D.C. — Experimental silicon microcircuit technology, now being developed at IBM, will allow an almost tenfold increase in circuit density over existing chips, according to IBM researchers who spoke at the International Electron Devices (IED) meeting here recently.

The one-micrometer circuits described by the researchers can perform switching operations three to four times faster than existing silicon circuitry at one-tenth the power.

The circuits are believed to be the smallest silicon logic circuits yet fabricated in large arrays, and the technology is said to be capable of producing up to 256,000 memory locations, or more than 10,000 logic gates, on a 4mm-square chip.

(Continued on Page 38)



This micrograph of the experimental Mosfet chip shows the one-micrometer technology.

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Any Input On Output?

Output is one of DP's slowest operations, so it is among the most challenging problems users face. If you have met this challenge, here's your chance to tell other *Computerworld* readers how you did it.

"Computer Output Equipment" will be the theme of a special report in the Feb. 26 issue of CW, and we want to hear from you.

Send about four typewritten, double-spaced pages describing the problems you have faced, how you handled them and your results to Howard A. Karten, *Computerworld,* 797 Washington St., Newton, Mass. 02160 by Jan. 15.

User Opts for M80 Instead of T/S

(Continued from Page 37)

ware were set up in two days, including testing.

The operating systems, VM/CMS and VS1, were running within four hours of turning the system over to the programmers, he recalled.

Once files from the service bureau were copied onto the Mitrol system, the system was ready for use. Total setup time was one week, Goff said.

Mitrol uses a California Computer Products, Inc. 8330 disk system, an IBM 3704 communication controller and an IBM 3272 CRT controller. Calcomp supplied a 1,000 line/min printer.

One feature of the M80 series that fits into Mitrol's requirement for an expandable system is its field-upgradability. A Magnuson spokesman said M80/4 systems are convertible to the M80/5, a more powerful model that will be introduced some time next year.

According to Goff, preventive maintenance includes the modification of circuit boards to make the M80/4 ready for conversion to the M80/5 if the user wants to make the change.

The M80 system is transparent to Mitrol programmers because it uses the same IBM software as the bureau does. Mitrol employs four programmers to handle company-related business functions and 12 programmers for client program development.

Mitrol plans to move to MVS, a Magnuson spokesman said. "It got a large consulting contract from a conglomerate and needed a data-based language that could undergo a lot of change," he noted.

The M80/4 at Mitrol, as well as all others scheduled for delivery, will receive enhancements over the next six months, including a channel-to-channel feature that will allow a system to talk directly to other systems, he added.

Mitrol's system "has more performance than we can use right now," Goff said, "so we can expand into its capabilities when we need to without making a lot of changes." He added that the M80 has the ability to handle more than 16M bytes of real memory and can run 16 channels, although he has not been able to take full advantage of it yet.

Goff praised the Magnuson personnel who set up the equipment. He described them as "very congenial" and said he was impressed with how smoothly they worked with the companies supplying software to the installation.

"Their understanding of software is very comprehensive," he said.

Circuit Density Boosted Tenfold

(Continued from Page 37)

The research, which has been done primarily on a form of metal oxide semiconductor field effect transistors (Mosfet) with polycrystalline gates, was described in a series of five papers delivered at the IED meeting. Most of the technology is reportedly applicable to bipolar transistors as well as Mosfet devices.

The Mosfet circuits' raw switching speed is 230 picosec, but that speed would rise to 1.1 nsec in a more practical configuration such as that used in a commercial application. Power dissipation of the chips is .00017 watt/gate, or 17 watt/chip.

'Unprecedented' Performance

That kind of performance was called "unprecedented" in silicon field effect transistor (FET) technology by the company, which noted that the papers delivered at the meeting summarized several years of work at IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y.

Although results of IBM's research indicate the devices can be fabricated successfully and can perform as expected in actual usage, the technology has only recently entered the practical stage and will probably not see application in commercial equipment for a while, according to the researchers.

Some of the work that has been done in that area involves the computer-controlled electron beam (e-beam) lithography used to produce the circuits. In making the one-micrometer FETs, lithographic line width is controlled to within .1 micrometer, and registration from level to level is reportedly better than .3 micrometers.

Line width on the devices described is one micrometer rather than the three- to four-micrometer line width used commercially, and since power dissipation is a function of the square of line width, reducing this parameter has a significant effect on power requirements, a researcher concluded.

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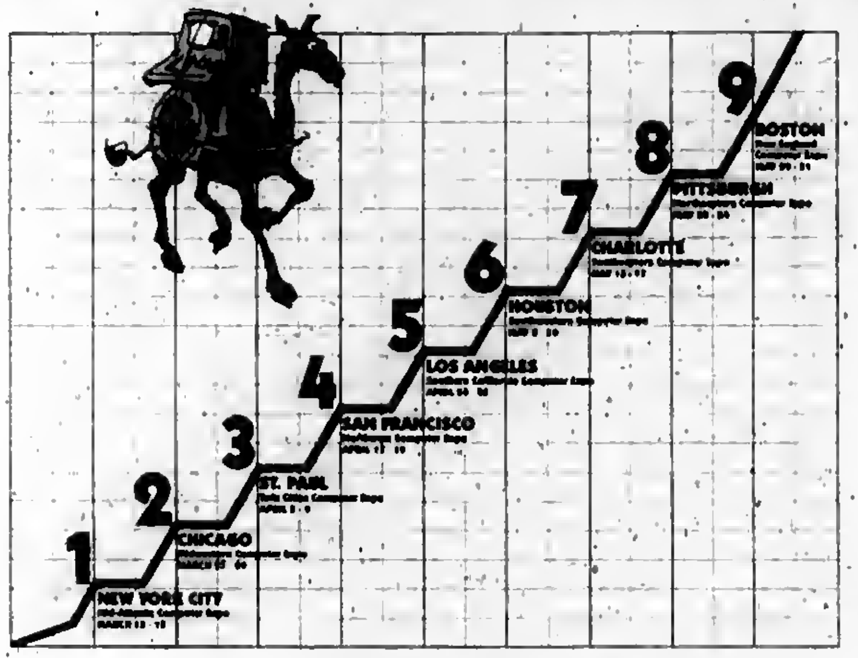

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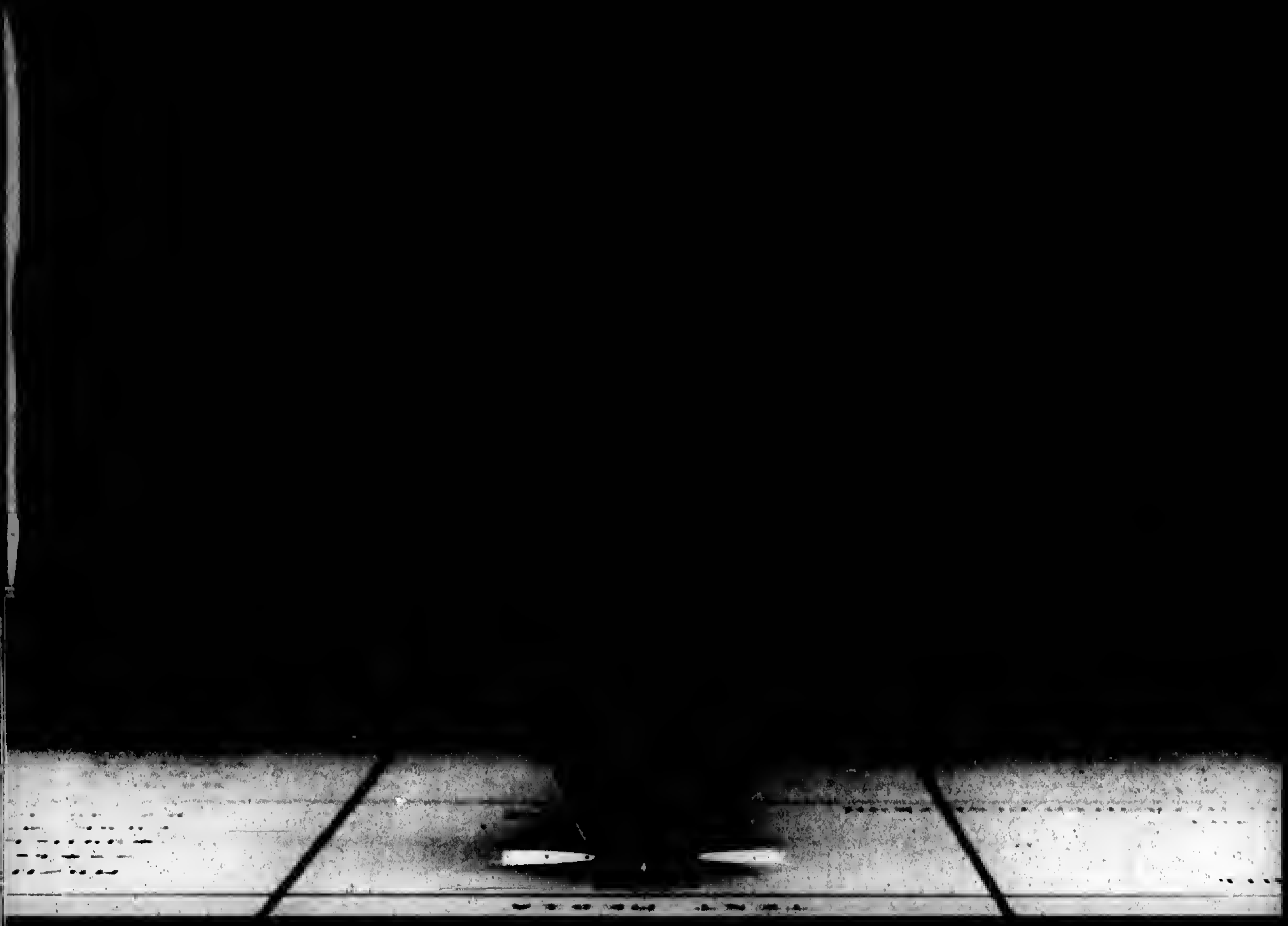

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Compact control unit, which requires less than one-half square foot of desk space, houses the System 760's advanced electronics

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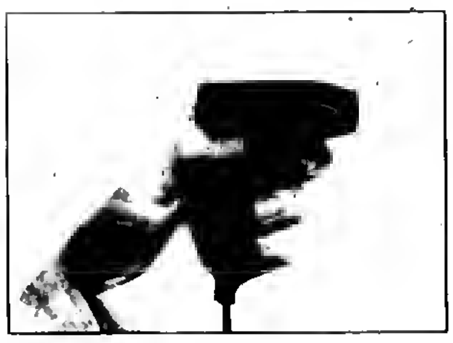

Yet with all its electronic sophistication and complexity, the Caere System 760 OCReader is no more difficult to use than a flashlight.

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The System 760 is the perfect expression of state-of-the-art technology. An advanced optical lens system, preamplifier, and electronic scanning array are all housed in the tough, handheld scanning wand. At the other end of the connecting 10-foot cable is the control unit which houses the Bipolar and MOS microprocessors, 16K ROM, and 1K RAM. The microprocessors enable the System 760 to recognize, validate, format, and transmit information to a terminal or computer.

The System 760 is capable of recognizing and transmitting data printed with the standardized OCR-A Size 1 character set that consists of:

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{SPACE}
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The most outstanding feature of the System 760 is its programmability. Most alpha/numeric formats in use today have a distinct "personality". Some easily recognizable formats include:

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The System 760 can be instantly programmed for recognition of a format "personality" by simply scanning an instruction code with the wand.

Actual Size

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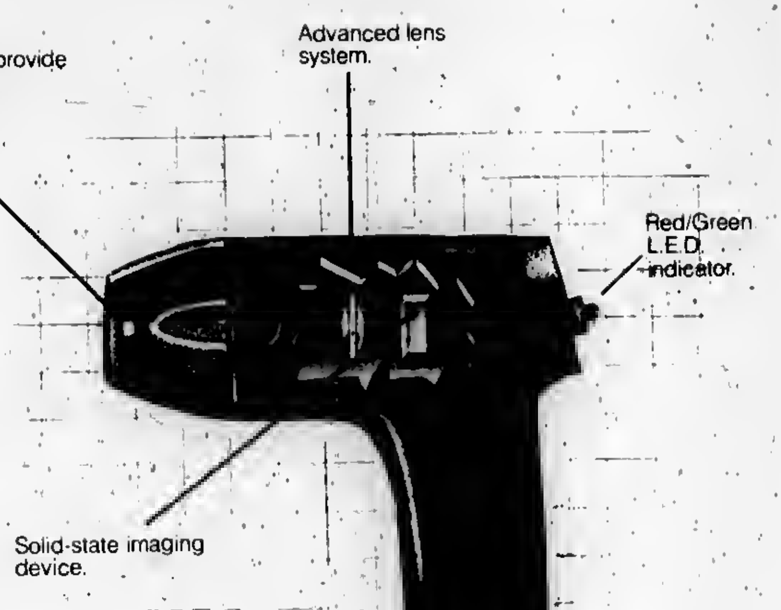
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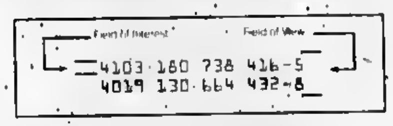

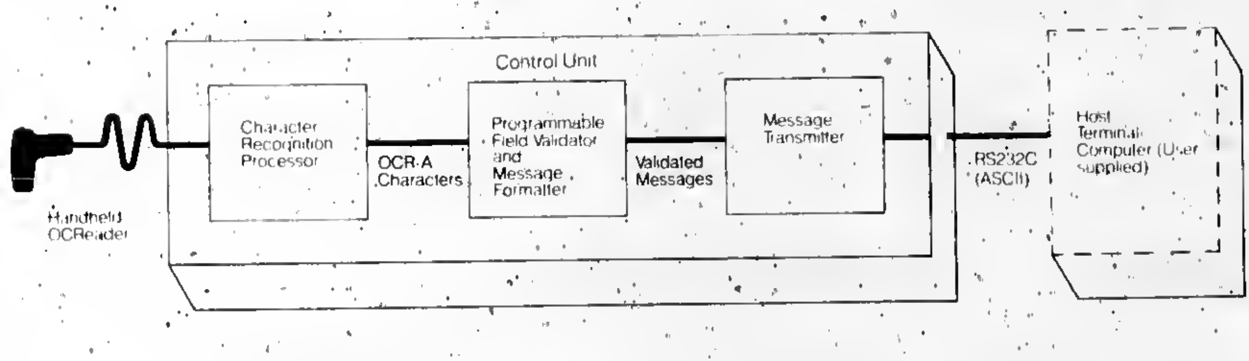
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Handheld OCReader
Character Recognition Processor
OCR-A Characters
Programmable Field Validator and Message Formatter
Validated Messages
Message Transmitter
RS232C (ASCII)
Host Terminal Computer (User supplied)

System features.

Handheld OCReader

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- Guidelights™ for easy positioning
- Automatic Line Tracking (ALT™)
- Red/Green LED indicator for system busy/system ready information
- 10-foot retractable cord
- Tone and volume adjustable beeper for valid read indication

Character Recognition Processor

- Character set: ANSI OCR-A Size 1 Y specification as defined in ANSI x 3.14 specifications
- Outstanding performance: Accuracy better than 1/10,000 Read rate better than 99/100
- Dual processor technology—Bipolar "front end" performs feature extraction in real time MOS processor performs character recognition and field validation
- 16K ROM and 1K RAM
- Linear Incremental Recognition (LIR™)

Programmable Field Validator

- Allows programming of specific formats to fit user requirements
- Wand programmable

Message Transmitter

- 100 character buffer

Interface

- Serial RS232C
- Standard 25 pin D Connector
- 7-bit ASCII character encoding
- Switch selectable Baud rate (300-9600 Baud)
- Switch selectable parity and stop bits

Automatic Self Test

SYSTEM 760

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Tell us how you would put the System 760 to work and you may find yourself in Tahiti.

Act now… save $1,000.

Earlier we said $895 was a good deal. Here's exactly how good. We're offering a complete evaluation package that includes the Caere System 760 OCReader, a programming manual, an operator's guide, a wand retainer cube, an IBM Selectric OCR font ball, pre-printed media sheets, and a serial RS232C interface for $895. Our regular OEM price for the System 760 alone is $1,895. For this reason, purchases are limited to one system per customer, and this offer is only valid until March 1, 1979. What we are asking in exchange is feedback. Tell us how you put the System 760 to work and how it solved your data entry problems. It could win you a super vacation for two in Tahiti. Don't wait, order your programmable System 760 OCReader today.

The contest.

Simply stated, the objective of the contest is to see who can come up with the most innovative and practical application for handheld, OCR data entry.

The rules.

The contest is open to anyone except employees of Caere Corporation. The purchase of a Caere System 760 OCReader is not required. The winning entry will be based upon originality and practicality. All entries become the sole property of Caere Corporation. Contest deadline is midnight, June 1, 1979. Winner will be notified by June 30, 1979. This offer is void where prohibited.

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A complete "Tahitian Escape" vacation for two that includes round trip air transportation from the West Coast, first class hotels on the islands of Tahiti and Moorea, inter-island transportation and transfers, twelve meals, excursions and island activities, and much, much more.

System Specifications.

Forward/Reverse read	
Yaw	±8°
Pitch	±8°
Roll	±15°
Depth of Field	0-.125″
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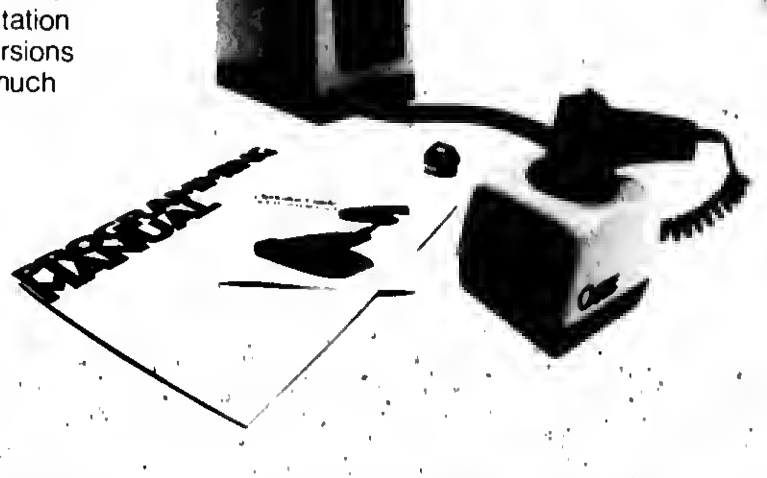

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Ampex Add-On Offered to Users Of IBM Series 30

EL SEGUNDO, Calif. — Ampex Corp. shortly will begin delivering add-on memory that it said is hardware- and software-compatible with IBM's Series 30 processors.

The ARM-3031 and ARM-3032 have four-way interleaving, while the ARM-3033 has eight-way interleaving. All three products are available in 1M-byte increments, with a maximum of 16M bytes in one cabinet, a spokesman said.

Memory expansion can be accomplished on-site, Ampex noted.

The Ampex ARM-30 series consists of a frame, interface logic, memory timing, control logic, memory boards, power supply, an error detection panel and cooling units. A special fault-indicator panel is included at the operator console that show if and where a fault is located — in the Ampex unit or elsewhere. Ampex stand-alone diagnostic software supplied with the unit aids in fault diagnosis, the company said.

Additional backup features on the unit include a modular power supply to facilitate rapid replacement in the event of failure and an optional power supply that will switch on if the primary power supply fails, the company noted.

The Ampex memory is priced at $50,000 for 1M byte and can be leased for $2,400/mo on a 24-month lease. The leasing price includes 24-hour maintenance.

First deliveries are slated for the spring, Ampex said from 200 N. Nash St., El Segundo, Calif. 90245.

Thermal Printer Built for OEMs

WOODLAND HILLS, Calif. — Dataproducts Corp. has introduced a dot matrix thermal print mechanism designed to let original equipment manufacturers incorporate a hard-copy capability into their terminals and systems.

The T-80M includes a print head assembly, servo mechanisms and servo electronics. Purchasers need only supply external TTL control signals and power, a spokesman said.

The unit prints 80 char./sec at a spacing of 10 char./in. The dot matrix technique allows the printing of 5 by 7 dot matrix char., with a 70 dot/in. horizontal or vertical resolution.

Six line/in. is standard, but printing and line-feed signals are supplied by the user. Minimum line feed is said to be .0166 in., with a paper advance speed of 80 msec/line.

The printer uses standard 8.75 in.-wide, roll-feed, heat-sensitive paper.

Mounted on an aluminum base, the substrate is said to allow fast head cooling between pulses, while permitting the head to remain on the paper. Not lifting the head from the paper for cooling is said to result in a print speed significantly faster than that of conventional thermal printers.

The T-80M sells for $890 in single-unit quantities and $595 in quantities of 100 from the company at 6219 DeSoto Ave., Woodland Hills, Calif. 91364.

Versatec Cuts Printer, Plotter Prices

SANTA CLARA, Calif. — Versatec, Inc. has announced price cuts and improvements on its recently introduced 1110-A line of electrostatic printers and plotters.

The price of the 1110-A printer/-plotter has been reduced from $8,000 to $7,600, while the Model 1110 — with plotter only — and the Model 1175 printer have both been reduced from $7,200 to $6,900.

A company spokesman said the price change was intended to make the firm's products more competitive and to reflect the standardization of parts for different electrostatic units.

Toner Improvements

The improvements center around the toner formulation and delivery. A new toner formulation, "Type S," is said to flow more smoothly and to adhere better to standard and translucent paper.

In combination with a reconfigured writing head and toner fountain, the revised formulation should produce a significant increase in darkness and contrast, according to the spokesman. This improvement can be maintained for hundreds of copies without adjustment, he added.

Delivery Enhanced

In addition, the toner delivery mechanism has been improved. The "ramp" toning fountain used in the company's other plotters has been added to these models; this is said to maintain longer toner contact with the paper.

Excess toner is removed by a newly designed vacuum channel. Wiper bars in the unit have been replaced, allowing the unit to use "negative pressure" to dry the paper and prevent evaporation of the toner.

Writing Head

A change in the writing head has improved its performance, Versatec said. The head consists of 1,056 writing elements, or nibs, through which a voltage passes. An alteration in the interface between the electrodes and the writing head allows the head to produce a better electrical charge, the company claimed.

A bulletin describing the equipment, "Printer/Plotter 1100/1110 Series," is available from Versatec at 2805 Bowers Ave., Santa Clara, Calif. 95051.

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Sycor 445 Gains Disk

ANN ARBOR, Mich. — Sycor, Inc. has unveiled a disk drive for its top-of-the-line Model 445 distributed data entry and processing system.

The Disk Module 80 stores up to 74.5 million bytes of usable data, according to the company. A maximum of four such units can be attached to the Sycor 445.

Together with the 10 million bytes of internal disk capacity in the processor, this gives the system a maximum capacity of 308 million bytes of disk storage, a spokesman noted.

The media for the drive consists of a removable, five-platter disk pack. The drive itself comes in either a single- or double-unit cabinet model, the company said.

Each cabinet contains circuitry that controls the input of data to and output of data from the disk units; as storage requirements grow, two controllers, one for each of the two cabinets, can be used to increase throughput capabilities.

The Disk Module 80 costs $27,000 for the single-unit model and $50,000 for the dual-unit model. Monthly lease rates for a single-unit model are $900, $833 and $765 on one-, two- or four-year agreements, respectively; the lease rates for dual-unit models are $1,650, $1,526 and $1,400.

Initial deliveries are scheduled for the second quarter of 1979, the spokesman said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Ansi Pondering Standard For Low-Level Interface

(Continued from Page 37)

all," Ross said. Industry observers regard most systems manufacturers as not aggressive in promoting standards, he explained.

"To us, the fact that we offered a standard is as important as the proposal itself," he said.

International Candidate

The Ansi committee, according to Schumacker, can pick either proposal, a combination of the two or nothing at all. But if Ansi makes a decision in mid-December at its San Francisco meeting, it will become the national standard. It will also be the U.S. candidate for the international standard.

Although Univac has already submitted its proposal for an interface standard to the International Standards Organization (ISO), Schumacker said if Ansi decides on a standard this month, only that standard will be offered as the American candidate for the international standard. The ISO has set a Dec. 31 deadline for proposal submissions.

The ISO's TC97/SC13/WG3 working group will then meet in March to determine the international standard. The American proposal for the standard will compete with a German offering.

The implications of the Ansi X3T9 committee's choice include its use as a Federal Information Processing Standard (Fips) according to Ross. The committee's proposals are sometimes adopted as a federal standard even before Ansi makes a decision on which proposal it will promote as a national standard.

'Encouraging' Response

The X3T9.2 subcommittee's response to the Univac proposal was "encouraging," Ross said. "I believe there is general acceptance, but sometimes the wind blows the other way."

Schumacker, however, cautioned that it is "a little too early to tell" what the committee will decide.

The Washington meeting in November was "a good technical meeting," he said, but nothing will happen until the San Francisco meeting.

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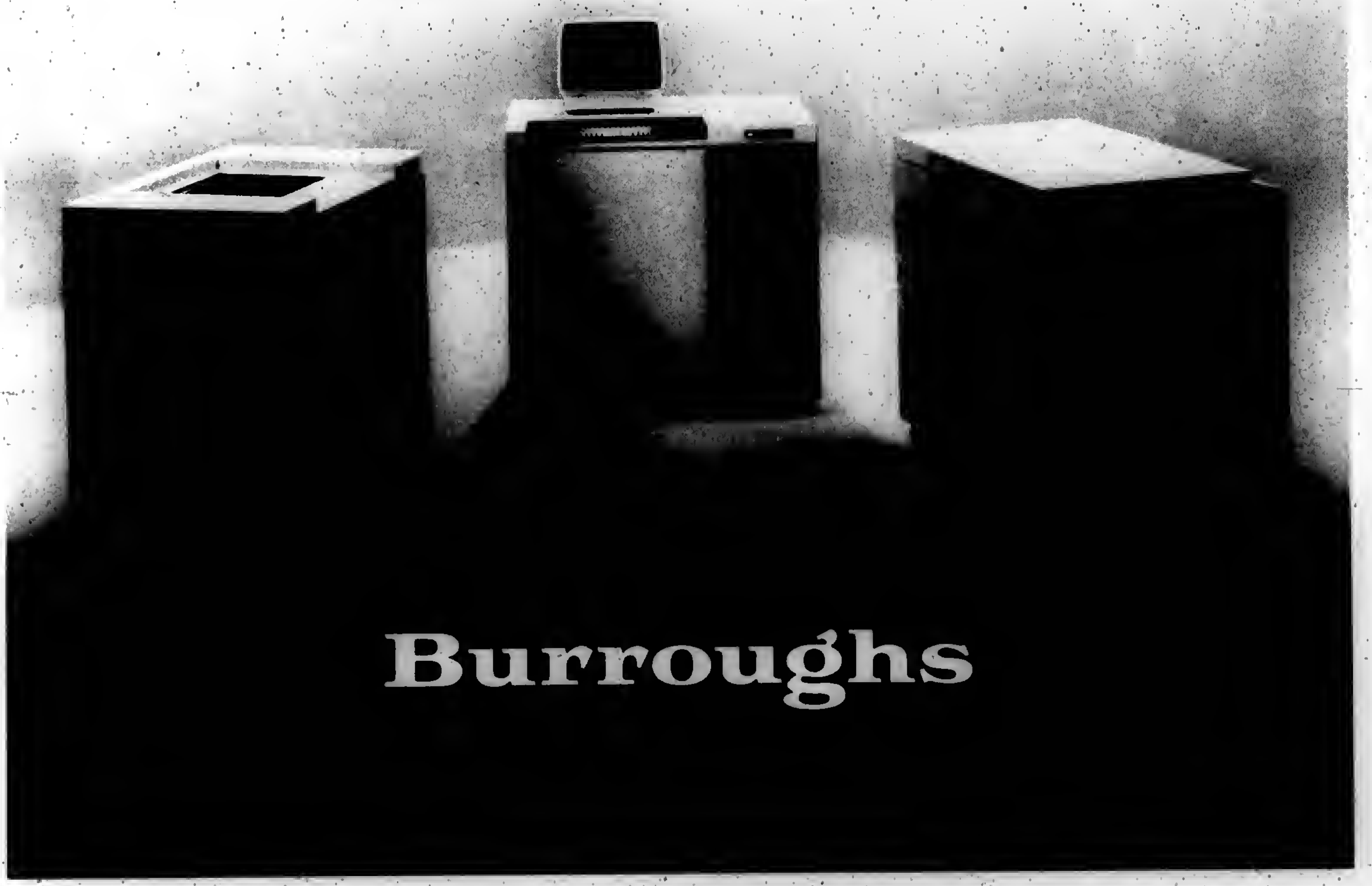

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Low-End Model Joins Datasystem Line

By Jeffry Beeler
CW Staff

Sporting an optional silkscreen print on its side panel, the Datasystem 150 rounds out the bottom of DEC's PDP-11-based small business systems line.

MAYNARD, Mass. — Santa Claus arrived early this year for users of the Digital Equipment Corp. Datasystem series as DEC last week introduced a low-end addition to the PDP-11-based segment of that small business computer line.

Likened in performance to the Datapoint Corp. 1500 and 2200 processors, the Datasystem 150 is said to be the first single-terminal member of its product family and to serve either as a stand-alone configuration for small companies or as an intelligent node in large firms' distributed processing networks.

With the introduction of the Model 150, DEC's Datasystem line now consists of five members that support anywhere from one to eight terminals simultaneously, according to a spokesman for the minicomputer manufacturer.

This range of configuration options constitutes the Datasystem line's main advantage over rival systems, he explained. Most users require several minicomputer models for their distributed processing networks because their configuration and performance needs vary from site to site.

Some network nodes, for example, demand only a single-terminal system, while others consist of multiterminal configurations.

With the addition of DEC's latest low-end business computer, the Datasystem can now meet a wider range of these network configuration needs than any other minicomputer line currently on the market, the source claimed.

DEC noted the Model 150 can run under its Commercial Transaction System-300 (CTS-300) operating system, the same software used by the other four members of its product family: the Datasystems 323, 325, 355, and 358.

Limited Peripherals

Although the low-end addition also uses the same PDP-11/03 processor chip as its sister systems, it packages that CPU differently to strictly limit the number and types of peripherals users can add to the configuration.

Available in 32K- and 60K-byte versions, the "bounded" system typically incorporates an integral VT100 CRT terminal, two 256K-byte floppy disk units and an optional 180 char./sec dot matrix printer, but accommodates no expansion hardware, the spokesman said.

The models 323 and 325, by contrast, support a practical maximum of three terminals, compared with a limit of eight

(Continued on Page 54)

Net Aids NFL's Pregame Planning

By Marguerite Zientara
CW Staff

SOUTHFIELD, Mich. — To help plan game strategy, more than half the coaches in the National Football League (NFL) are "reading the minds" of opposing coaches with the help of a minicomputer-based management information network centered here.

The network — which combines programs from Los Angeles-based Sports Data, Inc., a computer service center operated by Quanex Management Sciences, Inc. here, and remote Datapoint Corp. minicomputers — offers a "statistical compilation of how a team's opponents have reacted in various situations during their most recent games," according to a Quanex spokesman.

Such surveys, which cover field situations, defensive and offensive alignments and many other variables, have been done manually for years. But defining and tabulating such data by hand proved a formidable task because of the many variables involved and the need for speedy preparation of game plans.

In previous computerized analyses of game films, the biggest problem has traditionally been time. "It simply took too long to break down the data from the last game film, enter it into a computer and get back the necessary reports," the spokesman said.

An NFL coach, for example, must be ready to present his strategy for Sunday's game no later than Wednesday morning. This means he must have the computerized play analysis from the previous Sunday's game no later than Tuesday morning.

"In the past seasons it has been this situation which deprived most NFL teams of truly effective computer analysis of opponents' game tendencies based on their most recent game," the source explained.

While some teams have tried to analyze football games with computers used primarily for other tasks, this approach has usually

(Continued on Page 52)

Group Benchmarks 5110, Publishes User Ratings

BOULDER, Colo. — Double-density, dual-sided diskette units give the IBM 5110 a dramatic performance boost over the tape-based 5100 and rank among the features 5110 users like best about their systems.

That and similar findings emerged recently when Real Decisions Corp., a Stamford, Conn.-based consulting firm, surveyed 15 IBM 5110 users to find out how they rated their desktop systems' capabilities.

Commissioned by the Association of Small Computer Users (Ascu) here, the survey coincided with a sequence of six benchmark tests that Real Decisions performed recently to gauge the 5110's number-crunching power, I/O speed, program execution speed and ease of use. Together, the results of the benchmark tests and the user survey form the first in a series of six Ascu reports intended to provide small business system users with the objective technical data they need to choose hardware wisely.

The remaining five reports will

(Continued on Page 54)

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Local storage? Both floppy and cartridge disc, providing up to 20 megabytes of data storage.

Printing capabilities? A choice of line printers for high-speed output. On your own forms.

Communications? Two ports can be linked, via dedicated lines or dial-up, to the MARKLINK Host and your own in-house computer to provide interprocessing capability. An internal 2400-baud modem is standard.

All this, plus easy data editing, concurrent multiple-task data entry and a modular design that allows the system to grow as your data processing needs grow.

MARKLINK Protocol: Speeds data transmission like never before

With the MARKLINK System, you can now transmit multiple data streams simultaneously to the MARKLINK Host over a single high-speed, 2400-baud circuit. As the chart on the right indicates, it's almost as if each video display in each user location has its own private line to run its application in the host computer.

Another plus is the MARK III® Network linking the MARKLINK Terminal and MARKLINK Host computers. The world's most extensive commercially available teleprocessing network, it's serving 22 countries and providing over 5000 companies worldwide with fast, accurate response at an affordable price.

MARKLINK Host: All the computing power you'll probably ever need

With the MARKLINK System, you're backed by over $100 million worth of computing power. Maximum availability and reliability are achieved by tying together large central computers into *clusters*.

Should a computer fail, its processing load is shifted automatically to other computers in the cluster.

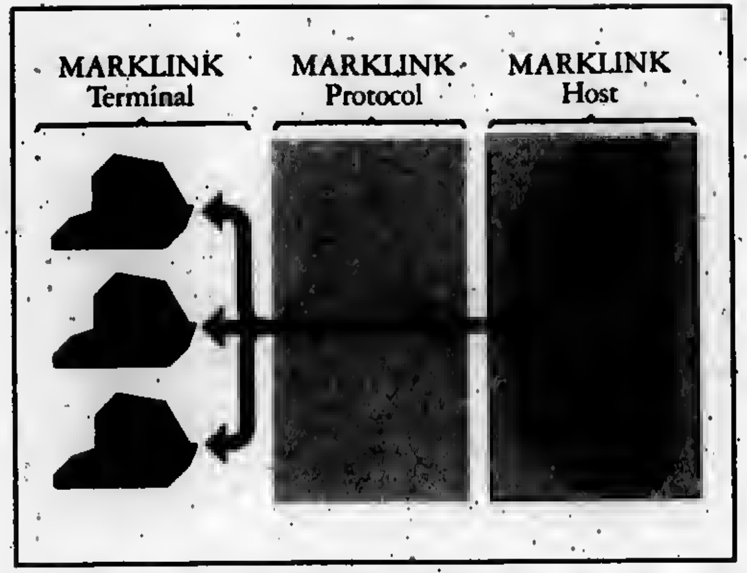
You're also supported by powerful host transaction processing software, which enables multiple

The do-it-yourself, piece-it-together approach was often the only real way you could implement a distributed data processing system.

*Service Mark of General Electric Company

distributed data processing.

risks and headaches of piece-it-together DDP.



***Unique multi-stream communications can save you money**—Because of the MARKLINK System's multi-stream communications capability, one circuit can now carry many data streams simultaneously. That means each video display can appear to have its own private line to an application in the host computer.*

users to share the same application program at the same time.

And you're backed by host computers that can interprocess with your own computers for improved system efficiency and productivity.

MarkLink Software: Designed *your* way

In addition to powerful host computer software, the MARKLINK Terminal comes with a full complement of utility software. Result: superior transaction processing capabilities.

For example, you can get a robust business-oriented language called TPL, complete with a full library of subroutines. Plus a text editor, data file utilities and an applications interface.

You get full prompting, editing and database control, too, with full concurrency, consistency and recovery capabilities. All the software tools and programs needed to get your applications on-line and working the way you want them to work.

MarkLink Maintenance: Just one point of contact

Think how much easier it would be to deal with *one* company instead of a multitude of companies responsible for bits and pieces of your system.

With the MARKLINK System, you can. Because General Electric takes full responsibility for maintenance and support of your entire MARKLINK System. Terminal hardware and software. Teleprocessing network. Host hardware and software. Even your GE-developed application programs.

So instead of a multitude of suppliers running around trying to fix the blame, you'll have one company working full time to fix the problem.

Make it easier on yourself

When you think about it, piece-it-together distributed data processing often creates more problems than it solves. It creates risks and uncertainties that, in the end, can seriously hamper your control over your data processing operation. And reduce its effectiveness.

That's precisely why you owe it to yourself, your DP operation and your company to learn more about the remarkable MARKLINK System.

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Now, GE makes it easier for any DP operation to reap all the benefits of single-source distributed data processing.

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IF SO, PLEASE SPECIFY: ________________

291-34

Net Gives NFL Coaches A Jump on Game Planning

(Continued from Page 49)

proven costly and ineffective.

Recognizing these drawbacks, a former semiprofessional football player named Joe Guardino developed an alternative method of analyzing games when he founded Sports Data and later helped establish the Quanex-Sports Data alliance.

When Quanex and Sports Data first offered the service, bottlenecks temporarily prevented full and effective use of the system, according to Quanex's marketing director, Mike Randall.

Quanex declined to identify what type of computer equipment it used at first. But when the firm began looking for replacements, it considered three or four systems before settling on Datapoint Corp. equipment.

Each of the company's minicomputer systems, which operate in each of the major U.S. cities with professional football team franchises, consists of a 32K-byte Datapoint 1500 CPU, a 500K-char. dual diskette unit and a 300 line/min printer.

NFL coaches, usually working with their upcoming opponent's last three game films, enter data about plays run during those games on special input sheets. The remote minicomputer systems then convert this data into machine-readable form, store it in the dual diskette units and eventually transmit it to Quanex headquarters over dial-up telephone lines.

In addition to a 1M-byte IBM 360/65, the Quanex computer center houses 2M-byte Itel Corp. AS/5S, 20 IBM 3330 disk units and a Comten, Inc. front-end communications processor.

Data usually goes to the computing center by Monday and returns a few hours later to the remote minicomputers. Thus, by 9 a.m. Tuesday, each participating NFL coach and his staff have all the information they need to begin formulating strategy for next Sunday's game.

By Wednesday, coaches can begin implementing the details of their upcoming game plan. "This rapid turnaround is absolutely essential to the service's effectiveness," Randall noted. "Even the loss of just one day working with the players on implementing game strategy is unacceptable."

More than 300 Sports Data reports are available for coaches, but they mostly work from a limited selection.

While the system is designed to allow coaches to analyze an opposing team, they also use it to study their own teams' offensive and defensive calls to look for any hidden or obvious patterns that could be detected by an opponent.

Enhanced Core Memory Cycles in 650 Nsec

WOODLAND HILLS, Calif. — An enhanced core memory system from Dataproducts Corp. accesses in 250 nsec and cycles in 650 nsec, according to a spokesman for the product's developer.

Packaged on one 11.75- by 15.4- by 1-in. board, the Store/3220 is reportedly plug-compatible with the Micromemory-3000 interface and suits both minicomputers and applications stressing speed and data integrity.

Users can link up to four of the nonvolatile 32K-word by 20-bit memories to provide as much as 128K words by 20 bits or 64K words by 40 bits of storage, the spokesman said.

The boards can also fit in an optional 19- by 22.4- by 5.25-in. chassis with a self-contained power supply.

Equipped with an optional self-test card, the Store/3220 requires +5V at 3.9A, +15V at 6.25A and -15V at .55A in "worst case" conditions and typically operates at 0°C to 50°C. An optional "extended temperature" version operates at 0°C to 70°C.

In OEM quantities, the Store/3220 costs about $2,000 from Dataproducts at 6219 DeSoto Ave., Woodland Hills, Calif. 91364.

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REMOTE CONTROL.

How Honeywell terminal systems help make computer power more accessible to end users.

Organizes Data Logically

Pegboard System Can Ease Transition to Minis

By Alexander Rosen
Special to CW

Why do some medium-size and small companies make an easier transition to minicomputers and reap more gains from that transition than others?

The answer lies in the effectiveness with which companies organize their day-to-day paperwork procedures — bookkeeping, accounts receivable and payable, inventory and sales reports. Often those procedures are considered so elementary that they are ignored when a precomputer analysis of standard office procedures is made.

Inevitably, computerization entails a different way of life in many company areas. However, companies often fail to reap the full benefits of in-house minis simply because they have given insufficient thought to basic paperwork organization. Consequently, a system in which a company invests considerable money, thought and time cannot be fully productive.

First-time users, dissatisfied because things have not improved as much as they had expected, may conclude that computers are not "everything they are cracked up to be." The deficiency lies, however, not in the hardware or software, but in that old intractable paperwork realm — the realm from which computer input derives.

What is necessary is a new paperwork philosophy consistent with the computer age's requirements. Large companies, of course, can tap their resident systems engineers' expertise, but what managers of small and medium-size companies often confront is a jungle of forms and procedures that has "just grown" over the years.

Managers have a multitiered investment in this jungle — an investment they are understandably reluctant to relinquish because no matter how impenetrable it is to the outsider, that jungle represents familiarity to the user.

In addition, the "old way" appears to ensure some measure of continuity during a transition period.

One way of maintaining this continuity while easing data entry is by using pegboard accounting systems. Used extensively as bookkeeping systems by computerless companies, pegboard procedures organize data logically and thus prepare the way for the kind of computer input stucture that was previously unavailable.

Pegboard systems enable users to enter all necessary operational and accounting data in one procedure. Secretaries or bookkeepers can write a check and post a journal sheet simultaneously, resulting in a sheet that provides easily usable input for the computer.

In such a procedure, all updating is completed in one sitting, so posting is cut by about 33%. Entries are made in logical sequence across the board. Because data must be written only once, transcription error rates decline and input quality increases.

Pegboard systems can make computer input preparation a routine and integral part of daily bookkeeping, thus allowing users to enjoy the maximum benefits of their computer investments.

Rosen is vice-president of NBS Systems, Inc.

Doctors Offered In-House Mini

PHOENIX — Physicians can reportedly lessen their reliance on service bureaus and thus tighten control over their financial data with an in-house medical minicomputer system from DeLair Data Systems, Inc.

Said to be equivalent in performance to the IBM System/34, the Model 1602M incorporates a 16-bit minicomputer with a 64K-byte main memory, 9.6M-byte removable cartridge disk unit, 160 char./sec printer and data entry terminal with page mode and editing capabilities, according to a DeLair spokesman.

Application software available with the system, which reportedly requires no special skills to operate, includes packages for medical accounts receivable, patient billing, aged accounts receivable, revenue and service analysis, family or individual statements.

The 1602M's $29,000 purchase price covers hardware, software and technical support, which includes training, conversion assistance and follow-up consultation. The system also leases for $650/mo under a five-year contract from DeLair at 2639 N. 33rd Ave., Phoenix, Arix. 85021.

Where end users are concerned; a computer is only as good as its terminal. A terminal that's easy to use, adaptable to different needs, and backed by a responsive manufacturer can make any computer operation more productive.

Honeywell's terminals are all of these.

A full line of general purpose display and printer terminals are part of the Series 60 family of computer systems.

In addition, Honeywell's Incoterm subsidiary offers a full line of terminal products that are compatible with Honeywell and other mainframe systems.

And all these terminals are designed for a wide variety of applications. They're equally at home in a small business environment or a complex communications network.

Visual display terminals.

VIP Series display terminals range from low-cost, conversational models for data entry, retrieval, and time sharing, to the sophisticated VIP 7800 Series with extensive editing and line graphic capabilities.

Matrix printer terminals.

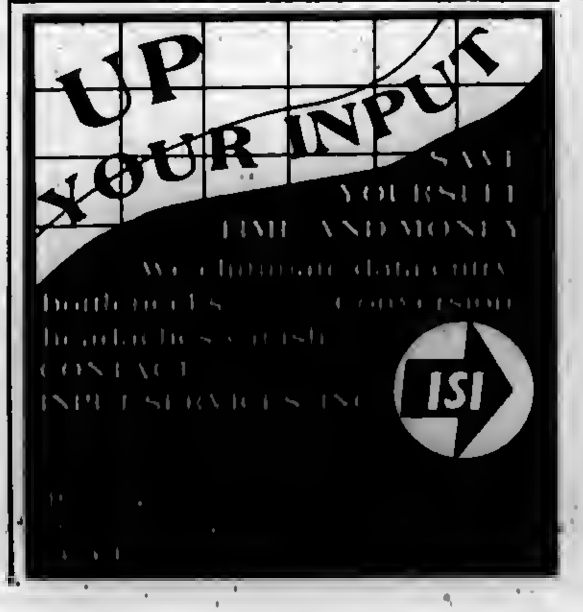
Honeywell matrix printer terminals are low in cost, high in reliability, and offer exceptional print quality. They can be connected locally or remotely to a host processor or to VIP display terminals. They include receive-only as well as keyboard send-receive models – and both synchronous and asynchronous versions.

Along with Honeywell's visual displays, these matrix printers provide a full range of responses to local and remote input/output control requirements.

They keep everyone in touch.

No matter which kind they are or where they're used, Honeywell terminals keep end users in touch with computer power. For more information on Honeywell terminals and matrix printers, write; Honeywell, 200 Smith Street (MS 487), Waltham, MA 02154.

Honeywell



Datasystem Family Gains Low-End Member

(Continued from Page 49)

terminals for the models 355 and 358; all four versions accommodated assorted expansion modules including hard disk systems, the source added.

As a stand-alone system, the Model 150 will suit users like doctors, dentists, accountants and other professionals. As part of a distributed processing network, the system will typically serve Fortune 1,000 firms like banks, insurance companies and airlines.

With its CTS-300 operating system, the Model 150 provides an IBM 2780 communications emulation package that reportedly permits the product to communicate synchronously or asynchronously at speeds up to 9,600 bit/sec with other Datasystem models as well as with PDP-8s, PDP-11s, Decsystem-10s, Decsystem-20s and most IBM 360 and 370 series systems.

Among its other communications features, the system comes with DEC's Dicam package, which is said to permit interactive, "terminal-centered" communications with 360 and 370 hosts.

In addition to providing sequential access, indexed sequential access and random file access methods, the Datasystem 150's operating system comes with DEC's high-level business language — Dibol — which accommodates applications like payroll, accounts payable and receivable, general ledger and inventory control, the spokesman said.

Using its integral VT100 CRT terminal, the system displays up to 24 simultaneous lines with a choice of 80-or 130 char./line; characters are upper and lower case. The terminal's other features include reverse video, underlining, scrolling and a detachable keyboard with an 18-key numeric keypad.

To enhance the system's visual appeal, users can order the Datasystem 150 with a choice of three 30- by 30-in. silkscreened prints that fit on the workstation's and cabinet's end panels. Designed for DEC by artist Corita Kent, the semiabstract, multicolored prints are said to harmonize with most modern office decor.

Without a printer, the system costs $7,900; with a printer, $10,900. A set of three optional prints costs an additional $125.

Deliveries of the Datasystem 150 will begin next March from DEC at 146 Main St., Maynard, Mass. 01754.

DATA CATALOGUE 2

The Comprehensive dictionary

"com•pre•hen•sive: completely covering or inclusive . . ."

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User Ratings of 5110 Published

(Continued from Page 49)

appear monthly, starting this month, and each will examine a different desktop computer system like the Datapoint Corp. 1170, the subject of December's upcoming study.

A Political Issue

In the 5110 system report, which was issued last month to Ascu members, almost all users gave high overall performance ratings to their hardware, especially their diskette units, which they frequently described as "outstanding."

Most 5110 users reported no downtime with their systems, and the few who did experience difficulty usually found IBM's service prompt and effective, the study noted. Only two of the 15 users polled by Real Decisions complained about the quality of the vendor's repairs.

Service, in fact, seems to have played a major role in many users' decisions to select their current system over its IBM equivalents. Although some respondents admitted that competitive products had outperformed the 5110 in benchmark tests, they said they opted for the IBM equipment anyway because it seemed the most politically expedient option.

In the computer marketplace, the respondents explained, few corporate decision makers challenge the wisdom of installing IBM hardware. But if an individual departs from orthodoxy and acquires competitive gear, he risks severe criticism if something goes wrong.

Elsewhere in the survey, many users reported some dissatisfaction with the 5110's display screen, and a few respondents regarded it as their systems' least desirable feature. Users particularly complained about the screen's poor readability and about its 64-char. display line, which they said hampers program debugging.

In the benchmark section of the study, meanwhile, Real Decisions wrote five Basic language programs, which it then used to test the ability of a 5110 Model 2 to run CPU- and I/O-intensive jobs, solve scientific/engineering problems and create accounts receivable files. The configuration used in the test cost $19,975 and consisted of a 32K-byte CPU, dual-drive diskette unit and 120./sec printer.

In the CPU-intensive job, Real Decisions noted how long the system took to perform additions, multiplications, divisions and other computations an N number of times. When N, the number of iterations, equalled 500, the elapsed time totaled 21.8 sec; when N equalled 1,000, 42.2 sec; when N equalled 2,000, 1 min and 23.4 sec; and when N equalled 3,000, 2 min and 4.7 sec, the study reported.

The test for an I/0-intensive job, by contrast, consisted of storing the numbers 1 to N on disks and then retrieving the first 50 figures factorially. As in the CPU-intensive job, Real Decisions ran four versions of the I/O test, with N again equalling 500, 1,000, 2,000 and 3,000.

The amount of time required to complete the four I/O tests totaled 2 min and 31.4 sec, 2 min and 57.6 sec, 3 min and 47.4 sec and 4 min and 38.4 sec, respectively, the study showed.

In the test of the 5110's ability to run a scientific/engineering program, Real Decisions instructed the system to use the "Gauss-Jordan method of elimination" to solve N linear equations with N variables. When N equalled 50, the system took 29 min and 47.2 sec to solve the problem.

The product planning task, meanwhile, involved a program model in which several key financial variables were repeatedly modified to predict their impact on production costs and profits. Real Decisions recorded a 24.2 sec benchmark for the test, the study showed.

In the accounts receivable job, the 5110 created a 50-record file with 10 fields per record. These fields included customer number, sales person number, year-to-date sales, previous-month sales (which accounted for five fields), payments and credit limit.

The system then randomly updated the file's sales amounts and payments 10 times and produced a report with billing details, including company name, salesperson, year-to-date sales, credit limit, amount outstanding and sales-by-month figures. Altogether, the test took 4 min and 11 sec, Real Decisions reported.

Ascu will provide the 5110 benchmark test results and the five succeeding reports to its members for a total cost of $150. More information is available from Ascu at 75 Manhattan Drive, Boulder, Colo. 80303.

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Micro Chips

TI 9900 Gets Software Support

HOUSTON — A low-cost alternative for software development for its family of 9900 microprocessors has been unveiled by Texas Instruments, Inc.

The TM990/302 is a bus-compatible member of the TM990 16-bit microcomputer family that can generate software using assembly language or TI's Power Basic language.

The unit's software developments tools, resident in erasable programmable read-only memory (Eprom), include a text editor, symbolic assembler, debug package, relocating loader, Eprom programmer and EIA interface to a TI990/4 or 990/10 minicomputer.

The software development board costs $625. The separate Eprom personality modules for programming various Eprom series are available at $60 each from TI's Inquiry Answering Service, 8600 Commerce Park Drive, M/S 6404, Houston, Texas 77036.

I/O Board Offers Programmable Ports

BERKELEY, Calif. — Thinker Toys has introduced the Switchboard, an I/O board for S-100 systems that offers four parallel ports and two RS-232/-teletypewriter serial ports plus strobe and attention ports.

The board has options for 4K of random-access memory (RAM) and 4K of erasable programmable read-only memory (Eprom).

Every port is switch-programmable for flexibility in interfacing various types of peripherals.

Both serial ports can be switched to any of 16 transmission rates from 110- to 19.2K bit/sec, the firm said. Each strobe and attention port flip-flop can be switched for positive or negative pulsing.

The Switchboard costs $199 in kit form and $259 assembled from Thinker Toys, 1201 10th St., Berkeley, Calif. 94710.

Postman Delivers

Micros Show San Jose the Way

By Ann Dooley
CW Staff

SAN JOSE, Calif. — When Monroe Postman arrived here several years ago with National Science Foundation (NSF) funding to bring new technology to local government, he found city offices desperately lacking automated methods and city DPers too busy to provide anything but payroll applications.

Postman's solution was to install microcomputers in several city departments so the users themselves could process information whenever they needed it. The plan has been so successful that it has saved the city more than $150,000/year in time and clerical costs, according to Postman.

When Postman first arrived, the only computer in use was a batch system with capabilities limited to putting out the city payrolls. He linked the city with the county's time-sharing computer system, but had to stop when city work began taking up too much of the county computer's capabilities.

Postman then decided to use microcomputers in the city departments that processed large amounts of information in short time periods.

Mostly Hobby Systems

At the time, computer companies were primarily marketing hobby systems that had to be built and maintained by the user, which Postman felt was undesirable for city use. The other option was desktop systems, which were too expensive, he noted.

The system Postman chose was the 8080-based microcomputer from Data Terminals and Communications, Inc. (DTC) of Campbell, Calif., one of the first companies to market microcomputer systems for the business user.

The micros have either two or four full-size Persci, Inc. floppy disks and 16K of random-access memory (RAM). They were a good choice, Postman said, because they support Basic and have good editing and letter writing programs and because the vendor responds quickly to support and maintenance requests.

The city has seven micros distributed in various departments: two in Public Works, one in Economic Development, one in Science and Technology, one in the Planning Department and two in Property and Coding.

Having users program their own systems is an approach that has worked out well for everyone concerned, according to Postman. The users know best what is needed in their work and thus avoid arguments and misunderstandings with general-purpose programmers about program expectations, he said.

In addition, users no longer have to wait for the central DP center to finish a program because when they need a new program, they sit down and write it themselves.

The system works beautifully in most cases, Postman said. The only problems have occurred when users were not particularly motivated to accomplish a task, he admitted. For example, a new application might have to be scrapped entirely or programmed by one of the regular DP people at his convenience if a user is reluctant to do it, but that doesn't happen very often, he said.

Training sessions were held when the micros were first installed so users could become familiar with computer systems and learn to work with them. The sessions were well attended, and almost all the users caught on very quickly, he noted.

Much of the data from various applications is shared among the departments. One office gives a

(Continued on Page 56)

Package Lets Users Write Z8 Software on Other Units

CUPERTINO, Calif. — Zilog, Inc. is offering the Z8 Software Development Package, which reportedly permits users to write and debug Z8 software without Z8 hardware.

The package will run on any Zilog MCZ or ZDX system with 60K bytes of memory. The package's two major components are an assembler for the Z8 PLZ/ASM structured assembly language and a Z8 simulator.

The PLZ/ASM assembler allows the generation of relocatable and absolute object code; the simulator enables the user to set and display simulated memory, set breakpoints and access simulated external memory.

Since a program can be completely debugged by the simulator before it is put onto the Z8 microcomputer, the user need only verify time-dependent code, Zilog said.

The Z8 Software Development Package, which includes a diskette with software and documentation, is available for $950 from Zilog, 10340 Bubb Road, Cupertino, Calif. 95014.

Phone Synthesizer Hitches To Micros Based on S-100

NEWPORT BEACH, Calif. — A phone synthesizer that can be interfaced to any microprocessor system with an S-100 bus structure is being offered to the hobbyist and small systems user by JHM Marketing Associates.

The S100-VSK is programmed to speak based on phonetic coding principles which enable it to produce all combinations of words and phrases, the firm said. The phonetic coding allows continuous speech at 15- to 20 char./sec.

The unit uses a Votrax VSK synthesizer from Federal Screw Works and is compatible with the commercial Votrax VS-6 system, a spokesman said.

The S100-VSK costs $695 from JHM Marketing Associates, Suite 212, 4340 Campus Drive, Newport Beach, Calif. 92660.

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Tape Transport Bows

YUCCA VALLEY, Calif. — A universal tape storage device that interfaces to most popular microcomputers, including non-S-100 bus systems, has been introduced by Meca, manufacturer of mass storage systems.

Called Beta-1, the unit plugs directly into a standard 8-bit parallel port; serial port attachment is offered as an option. The high-speed digital tape transport features random seek at more than 100 in./sec with average access times in 10 sec or less, according to the firm.

Loading is at 8,000 bit/sec with 16,000 bit/sec available as an option.

The device includes an internal 8035 microprocessor with a 1K-byte program and a high-level tape operating system.

The Beta-1 costs $399 from Meca, 7026 O.W.S. Road, Yucca Valley, Calif. 92284.

168
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Three-State Output

Intersil Offering 12-Bit Converter

CUPERTINO, Calif. — Intersil, Inc. has introduced a monolithic analog-to-digital converter chip which it claimed is the industry's first ±12V, 12-bit device.

Intended for a wide range of microprocessor interface applications, the ICL7109 features a three-state output which enables it to be directly interfaced to most microprocessor data buses which are 8 bits to 16 bits wide.

The device can also be used for remote serial data logging applications, a spokesman noted.

Fourteen data output lines are included, providing 12 magnitude bits plus polarity and out-of-range bits. The output lines can be grouped into 8-bit bytes, each activated by its own byte-enable signal, plus a master chip-enable line.

Handshake Capability

For remote data transmission applications, the unit has a handshake capability so it can be directly interfaced with universal, asynchronous receiver/transmitter (Uart) logic.

The ICL7109 can either be brought under control of the microprocessor with start-convert, status and byte enable lines or sequenced through its 8-bit bytes either synchronously or on demand from the microprocessor or the Uart.

The ICL7109 costs $10 each in 100-unit quantities for a 40-pin plastic model and $19.80 for a ceramic dual-in-line version from Intersil, 10710 N. Tantau Ave., Cupertino, Calif. 95014.

Cassette Program Offerings Listed

EL DORADO, Calif. — A reference list of programs on cassette for the Radio Shack Corp. TRS-80, the Commodore Business Machines, Inc. Pet and the Apple Computer, Inc. Apple II microcomputers is now available to users of those systems.

The reference list contains more than 1,000 cassettes from over 100 sources. Robert Elliott Purser, who spent a year compiling the list, publishes the list quarterly and includes photographs of CRT screens for some of the programs.

The reference list costs $12 for one year's subscription; single copies cost $4 each.

Information on software for sale or trade can also be sent to Purser at P.O. Box 466, El Dorado, Calif. 95623.

Users Group Gets Started

NORCROSS, Ga. — Compucolor Corp. has formed a group and begun publishing a newsletter for users of its Compucolor II.

The users group will serve as a forum where users and owners can exchange programs, ideas and problems. Software contributions may be accepted by the company on a sale or trade basis, and users can trade for other programs.

Organization for the group will be provided by a newsletter, "Colorcue," which will be published monthly.

More information is available from Compucolor at P.O. Box 569, Norcross, Ga. 30071.

Way Shown To San Jose

(Continued from Page 55)

floppy disk containing information to another, so the information can be applied to a variety of uses. File standardization and adequate communication between departments is necessary for this procedure to succeed, Postman explained.

The DTC micros run under the CPM operating system and utilize daisy-wheel printers for writing form letters. Two CRTs, one of which is an Owl from Perkin-Elmer Corp.'s Data Systems Division and the other a Hewlett-Packard Co. graphics terminal, are used for daily information processing.

The micros perform general business applications such as keeping track of money, cross-tabulating data from different departments, writing letters, tracking delinquent accounts and performing calculations such as mortgage fees.

The city is planning to install a microprocessor traffic controller and an inventory system to locate street lights around the city. That project has been delayed because of a lack of funding brought about by Proposition 13.

Computer Systems Professionals

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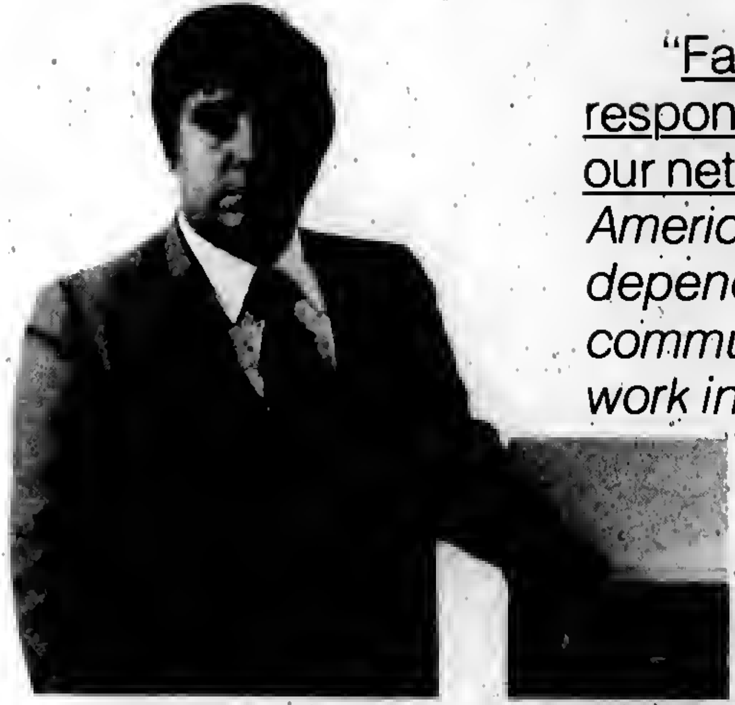

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Seeking More Rivalry, Capital

CCIA Meet Examines Industry Needs

By Marcia Blumenthal
CW Staff

PALM BEACH, Fla. — Increasing the amount of competition in the DP industry and sparking capital for high technology investment are two major industry issues, according to Harold E. O'Kelley, chairman and president of Datapoint Corp.

O'Kelley, who was elected chairman of the board of the Computer and Communications Industry Association (CCIA) last September, talked about the CCIA's major concerns and his own views of the industry during a recent interview. Others participating in CCIA's winter meeting here also voiced their impressions of the issues facing the industry.

IBM's domination of the marketplace continues to be a thorn in the side of CCIA members. However, O'Kelley said the U.S. vs. IBM suit is too far along at this point for the CCIA to have much influence on its outcome, whereas the suit against AT&T, which is still in its early stages, offers a much better opportunity for the CCIA to exert its influence.

In discussing competition from the two giants, A.G.W. "Jack" Biddle, CCIA president, pointed out that to sustain corporate growth goals of doubling revenues and earnings every five years, both IBM and AT&T will increasingly invade market opportunities forged by smaller firms.

Agreeing with O'Kelley that "the office of the future" was one of the largest opportunities on the horizon, Biddle illustrated IBM's encroachment on that marketplace. Recently, the Office of the President of the U.S. requested proposals for converting to an office of the future. "The only company that had solved both the communications and hardware interface standards problems was IBM," Biddle said forcefully.

Invading Others' Turf

Harry Edelson, vice-president for research at Drexel, Burnham, Lambert, Inc., had a more optimistic view of the marketplace. "Whenever any company announces a product that invades someone else's turf, Wall Street panics and says other companies won't be able to compete. The panic is on the stock prices; the operating results show something different," Edelson emphasized.

Since the introduction of IBM's 30 Series processors, other mainframers have increased their profitability, Edelson noted, pointing to NCR Corp.'s recent margin increases from 5% to 16%.

While O'Kelley did not foresee any major industry shakeouts in the next year, he said that large companies will acquire more and more small companies that specialize in distributed processing systems and time-sharing companies will see increased consolidation. However, he added that Datapoint is not a candidate for acquisition.

Boon to Small Firms

Turning to the issue of investment in technology, which he considers particularly pressing, O'Kelley credited the new capital gains tax legislation with being a boon to capital formation for small high-technology firms.

On the other hand, the change in the progressive corporate income tax structure will not have much impact on investment in technology within existing firms, but it shows Congress is thinking along those lines. "Why not allow companies to earn $5

(Continued on Page 60)

Commerce Seeking Policies to Spur Firms' Innovation

By Marcia Blumenthal
CW Staff

PALM BEACH, Fla. — When the 1976 edition of *Science Indicators* was published, President Carter asked why industry leaders were taking an increasingly short-term view of their industries. The question he should have asked was what federal policies are needed to encourage industrial innovation in the U.S., according to Jordan Baruch, assistant secretary for science and technology at the U.S. Department of Commerce.

Carter did, in fact, ask that question later, charging the Department of Commerce to study the problem and suggest the federal policies needed to create innovation. Baruch defined innovation as taking an idea from its formative stage to commercialization throughout society, a process that is not the same as invention.

The study Carter requested is now under way, and specific policy recommendations will be sent to the President on April 2, Baruch told executives attending the winter meeting of the Computer and Communications Industry Association (CCIA) held here recently.

Innovation takes place within the firm,

(Continued on Page 62)

China's Electronics Lagging, Despite Progress, Report Says

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Mainland China's electronics industry "has done a creditable job," but "in spite of rapid progress, shortcomings in product quality and technical sophistication remain," according to a recent congressional report.

The report, "Chinese Economy Post Mao," released here recently by the Joint Economic Committee, said the significant development of electronics in China since the late 1940s "stemmed from its priority in both the military and industrial programs of the Communist leadership."

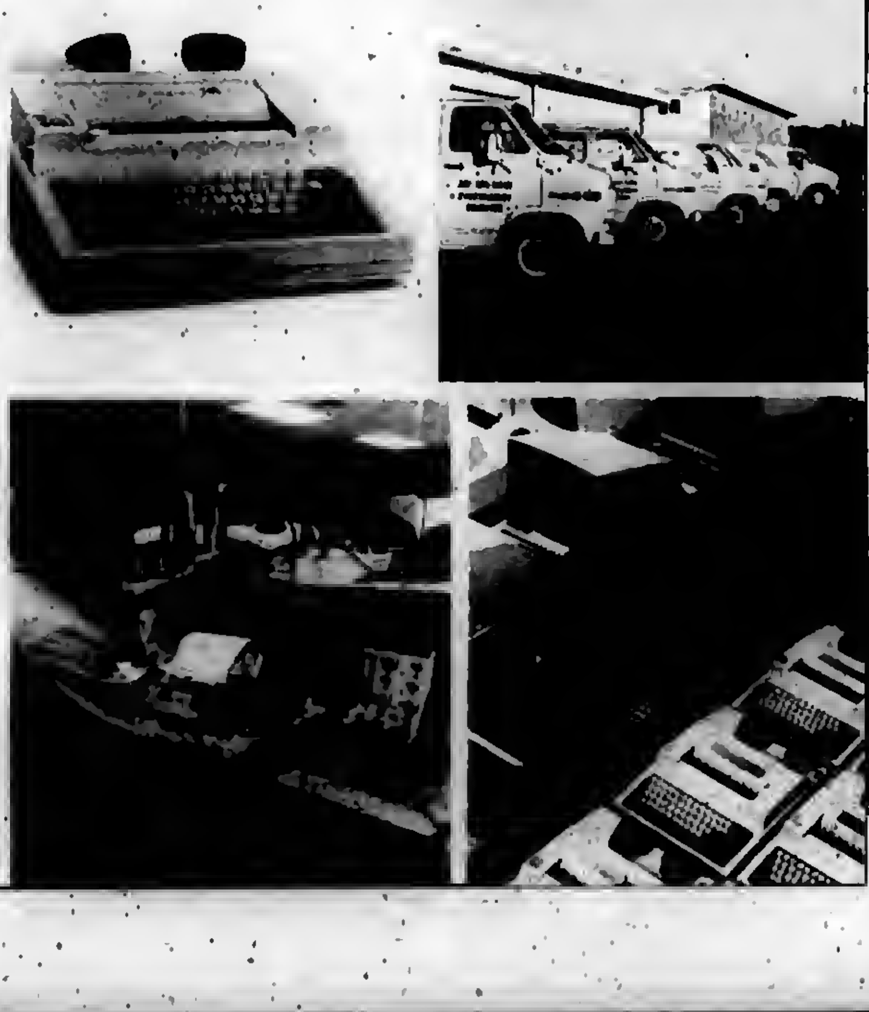
Quoting the minister of machine building, the report said, "The electronics industry has developed into a well-formed new industry; however, our electronics industry is a relatively weak link. The technical level of its products is not high, its production efficiency is low and it still cannot meet the needs of national defense and the building of the national economy.

"There is still a considerable gap between the level of electronic technology and advanced world levels. We are not [falling any further] behind in developing semiconductors, computers and other specialized fields, but the gap between us and advanced world levels in other areas has widened."

The congressional report credited "the infusion of foreign technology and equipment" since 1961 with playing a "critical role in the development of new products and the upgrading of manufacturing capability."

China produces a "broad range of elec-

(Continued on Page 64)



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CCIA Meet Examines Industry's Major Needs

(Continued from Page 59)

million before taxing them at the maximum rate?" he suggested.

While firms' earnings will probably go up next year, O'Kelley said these increases will not be high enough to support R&D investment.

Aside from the well-known statistic that U.S. expenditures for R&D as a percentage of GNP is dropping, O'Kelley also pointed out that U.S. investment in plant and equipment as a percentage of GNP is low. Last year Japanese industry invested 28% of its GNP in that area, whereas the U.S. investment was 16%.

Increased capital availability through tax incentives will allow investment in plant and equipment, O'Kelley noted, adding that this would spur investor confidence in U.S. businesses' survival.

CCIA members are also concerned about wage and price controls. Agreeing with public remarks made by Edson D. deCastro, president and founder of Data General Corp., O'Kelley said he is not as concerned with raising prices as he is with being able to pay people and suggested that for every 1% prices are not raised, salaries should be increased at a corresponding rate over the minimum standard set by the President. If computer companies do not adhere to the President's guidelines, O'Kelley said he fears those companies will not be able to do business with the government.

As far as threats from the Japanese DP industry are concerned, O'Kelley said competition in the semiconductor area will be stiff, but in the equipment area sales and service by Japanese firms are still fragmented. However, he did express concern over the growing nationalism in some countries that could preempt American products gaining a share in foreign markets.

O'Kelley said he did not foresee any major technological developments in the next year, but noted that more sopohisticated uses would be found for printers, lasers, optic fibers and xerography.

High-Density Floppy Disks Seen Taking Over Market

PALO ALTO, Calif. — High-density floppy disk drives will become a reality in the early 1980s and could take over half of the market by 1987, David Kalstrom, floppy disk product manager for Pertec Computer Corp.'s (PCC) Pertec Division told an audience at the Invitational Computer Conference here recently.

Vendors are increasingly seeing their market opportunities come from small business system users who want the convenience of floppy disks — and the higher the capacity the better.

By 1981, floppy disk drives with capacities of 5M bytes or more could easily be on the market, he projected. If so, the total industry market for floppy disks could easily increase from a 1981 level of 500 million units to a 1987 level of 1.2 billion units — with high-capacity units accounting for 2% to 15% in the early '80s and 50% or more by the end of the decade, Kalstrom noted.

Over this same period, prices of high-density disks will drop dramatically in relation to capacity, thus giving users a strong economic incentive to use such products.

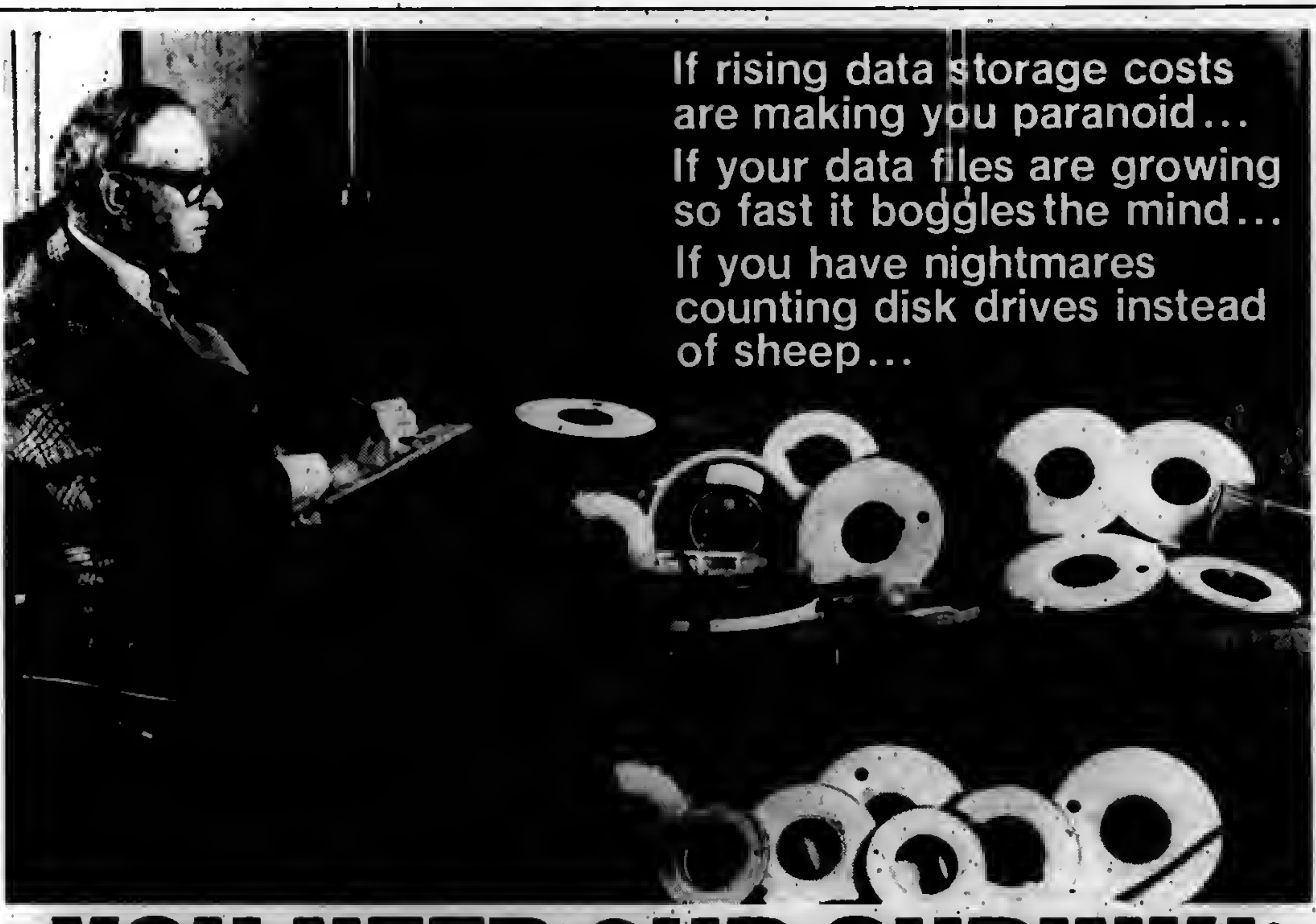
"Whether all of this comes about is going to depend on some technological advancements in diskette characteristics," Kalstrom noted.

"What makes this advance so attractive is the increased capacity that can be achieved for a very small increase in dollars. In addition, there would be less head wear and less media wear.

"Until now, the industry has not produced satisfactory double-headed, double density disks. But we are presently on the threshold of high-volume availability," he observed.

Executive Corner

- Hark M. Vasa has been appointed vice-president of management and information systems at Decision Sciences Corp.
- Robert F. Ferrara has been promoted to vice-president and general manager of Dataproducts Corp.'s New England Division in Wallingford, Conn.
- Jesse A. Simmons has been appointed vice-president and controller of Inforex, Inc. Robert J. Moore has been appointed senior vice-president of the firm.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Durango's 'In-House Joke' Shared With Public

By Marguerite Zientara
CW Staff

CUPERTINO, Calif. — "Our customers will think it's the truth!" was the good-natured reaction of the author of the "job description" reproduced here when he learned Durango Systems, Inc.'s president, George Comstock, had leaked the document to the press.

Calling the description an "in-house joke," author Gary Williamson, manager of the software development group at Durango, explained that he wrote the description for an employee/family open house held at Durango's plant here last fall.

While the other departments within Durango posted straightforward job descriptions for visitors, Williamson said he originally wrote his "to lighten things up a little," and added, "but actually it turns out to be truer than people might realize."

Cash Flow

Since Durango is a new company, about one year old, "there is a cash-flow problem, and we all feel underpaid as far as the industry standard goes. But we feel it's worth it," he hastened to add, "because we're trying to make a new company 'go' here."

Durango has a total of about 60 employees in functions ranging from engineering and manufacturing to finance and marketing, Williamson noted, "the whole gamut."

Good Team, Long Hours

Seven of those employees are in Williamson's software development department. "We work very well together," he said. "We all work long hours, as the description suggests, but we all enjoy our work," Williamson continued. "This thing was just meant to be humorous."

He said the long hours and unified effort apply to everyone in the company, not just the software development people.

"We're trying to develop a product, and we work very closely with the hardware people. We end up programming around all their [hardware] problems and having to fix our own," he laughed. "So we have kind of a joke between us.

"As far as software goes, our whole effort here is fairly wide," Williamson remarked. "We're developing an operating system, application programs, language processor, the whole works — a total computer system software set for our low-end machine."

Durango's low-end machine is the F-85 desktop computer. "It's an inexpensive computer as far as computers go, but we feel it's fairly powerful in its capability," Williamson noted.

Although Durango personnel may feel underpaid and overworked at times, Williamson said, "We get our rewards when we are successful."

**Software Development
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In this area, the most talented and underpaid employees of Durango are assigned the job of programming around hardware deficiencies, making the machine appear that it's doing something for marketing purposes and setting up games, etc. for important functions such as company open houses. During off hours (evenings, weekends, holidays, etc.), they are expected to donate their own time developing things such as operating systems, language compilers, application packages, system diagnostic programs, etc. They are allowed time for four meals a week, 12 hours of sleep for each 106 hours of duty and an option of leaving the building twice a yea

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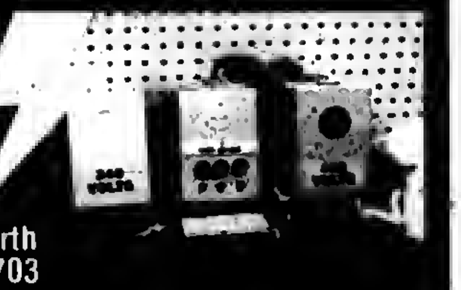

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Agency Studying Innovation

(Continued from Page 59)

Baruch said, and "the only thing the federal government can do is change the firm's ability or decision to innovate."

However, industry structure may stifle the decision to innovate, and firms seeking to increase market share tend to deemphasize innovation, he charged.

For example, IBM expects its revenues to grow 15% annually. In that instance IBM is looking for a 4% annual increase in market share, Baruch said, noting that 11% of that revenue growth would come from inflation and normal growth relative to the GNP.

One Alternative

One alternative, Baruch suggested, is developing policies that limit a business's size.

On the other hand, a strategy that encourages increasing the proportion of a particular industry's share of GNP may foster innovation. One method of achieving that expansion is government assistance in developing technology, much like what the Ministry of International Trade and Industry does in Japan. Or, several small- or medium-size firms may decide to pool R&D resources with some government subsidy, Baruch maintained.

When asked whether the government would allow targeted intervention, Baruch said that recommendations targeted to specific industries is the basis of the study.

During the question-and-answer period following Baruch's presentation, Raphael Coleman, president of Atlantic Research Corp., said the problem was an economic one rather than a lack of industry innovation.

Optimistic Outlook

Baruch agreed that the balance of exports, inflation and unemployment were all economic problems, but his optimism was evident when he suggested policy recommendations such as finding ways to increase productivity to help halt inflation and keying U.S. products to specific foreign markets to improve the balance of trade.

Noting that some CCIA members were individual participants of the advisory committee, Baruch also asked the association to submit a set of policy recommendations to the committee by month's end. Documentation of instances that stifle innovation are critical, he warned. "A personal feeling on a subject isn't enough," Baruch admonished, adding that anecdotes or case histories would be adequate documentation.

In bringing the 75-member advisory committee together, Baruch emphasized that Commerce officials avoided selecting R&D managers, preferring instead to choose chief executive officers or executive vice-presidents of companies spanning a broad spectrum of industries and sizes.

Between Jan. 15 and 26 the industry advisory committee will meet with representatives from several government agencies who are independently assessing government industry policies. At that time, the two groups will hash out their differences and hope to come up with specific recommendations, Baruch noted.

Amdahl, Fujitsu To Cross-License Semi Patents

SUNNYVALE, Calif. — Amdahl Corp. and Fujitsu Ltd. have agreed to cross-license their patents relating to semiconductor technology. That capability will be used to develop Amdahl's next generation of computer systems.

Although both Amdahl and Fujitsu will use certain common semiconductor technology in their next generation of systems, the systems will be designed independently, Amdahl said.

The agreement calls for Amdahl to contract with Fujitsu as its principal source of custom LSI components, with Fujitsu continuing to assemble part of some Amdahl subsystems.

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China Opening Doors To Foreign Investors

WASHINGTON, D.C. — The People's Republic of China is opening its doors to joint ventures with foreign investors. That policy recently became apparent at a high-level trade meeting between French and Chinese officials.

At a different meeting in Paris, U.S. officials conferred with European and Japanese representatives about relaxing curbs on the export of strategic and technologically advanced goods to communist countries. While delegations to the meeting of the Coordinating Committee on Export Controls were seeking a relaxation on export controls, a U.S. official said that members of the committee agree that certain items "still need to be controlled."

It appears unlikely that U.S. computer companies will be able to take advantage of either trade or joint ventures with China on a wide scale in the near future, according to a U.S. Department of Commerce China trade expert.

Even though rumors abound, the Commerce Department official said he has not seen any softening of the U.S. government's position on computer trade with China.

The Chinese change of heart in allowing foreign equity ownership of its companies is part of the "Four Modernization" program, the expert said.

Under that program, China plans to modernize its industry, agriculture, defense and science and technology capabilities. To achieve the growth plans called for by the end of the century, China requires a formidable amount of capital goods, the Commerce official continued.

One idea behind the joint ventures is that China supplies the factory sites and labor and foreign investors supply the machinery and technological "know-how." In return, China makes much of the factory output available to foreign investors for export, the official said.

By permitting joint ventures, China avoids about 50% of the capital expenditure for needed manufacturing equipment and is thereby able to spread its financial resources across a broader base of investments.

//

China's Electronics Industry Still Lagging Despite Recent Progress

(Continued from Page 59)

tronic equipment," including components, electronic instruments, computers and communications equipment, the report said. Output for 1977 was estimated at $2 billion — twice the 1972 level, with most of the equipment allocated to the military.

China claims to have 2,000 electronics enterprises, with about 200 major plants employing a total of almost a half million people and about 500 smaller plants employing less than 500 people each. The remainder consists of small, community workshops.

Electronic Components

Discussing electronic components, the report said the Chinese are seeking mass production technology and plant equipment from Japan for integrated circuits and large-scale integration. China would have procured the technology in the early 1970s if not for "internal political turmoil," the report added.

"Most of China's computers are one-of-a-kind or batch assembly items developed independently at a number of research institutes and production facilities," the congressional report said. Computers in service are "clearly inadequate in numbers and capabilities to meet military and industry needs or to train sufficient personnel in computer applications," it added.

"Furthermore, the understandardized output from these varied facilities precludes any rapid development of a common body of knowledge in computer applications and software." This, the report said, explains China's recent increased interest in importing computers and DP technology from the U.S. and Japan.

Turning to communications equipment, the report said "current accomplishments include development of a national microwave/coaxial cable trunkline and construction of a domestic satellite ground station. The Chinese also have expressed interest in technology for a domestic communication satellite system, according to the report.

China also imports "sizable quantities of instruments because of the unreliability and lack of precision of domestic production." This situation, the report said, is unlikely to change in the near future.

The report concluded that "China suffers from an extreme technological lag between its state of the art as exhibited by laboratory-produced electronics equipment and its quality of mass production.

"While China Is able in some areas to imitate Western developments of the last decade in one-of-the-kind or small-batch production items, electronics production in the main tends to run 10 years or more behind the world state of the art in terms of embodied technology."

As a result, the report predicted, China will continue to import electronics to develop "basic expertise in all areas of production."

Supershorts

Digital Equipment Corp. has agreed to sell Norden Systems' mil-spec PDP-11M minicomputers to industrial users. Under the agreement, Norden will provide training, installation and maintenance for these products.

— — —

Canada Systems Group, independent Canadian data services company, plans to acquire as wholly owned subsidiaries Compumatik, Inc., which provides computerized scheduling services for schools using leased software, and E. Moss & Associates, a DP service firm.

— — —

Microsoft, U.S. microprocessor software supplier, has set up a marketing operation in Tokyo called Ascii Microsoft to sell system software to OEMs, dealers and end users in Japan and the Far East.

— — —

Information Terminals Corp., manufacturer of magnetic storage media for data and word processing, has changed its name to Verbatim Corp., effective immediately.

— — —

Randomex, Inc., manufacturer of automatic disk cleaning equipment, as agreed to merge with Data Maintenance, Inc., a maintenance service firm that will operate as a Randomex division.

— — —

Intersil, manufacturer of LSI circuits, computer microsystems and related equipment, has declared a cash dividend of 6 cents a share payable Dec. 15 to common and preferred shareholders of record Dec. 1.

— — —

Greyhound Computer of Canada Ltd. declared a common stock dividend of 5 cents a share payable Jan. 2, 1979 to shareholders of record Dec. 8, 1978.

— — —

Mohawk Data Sciences Corp. has agreed in principle to acquire Trivex, Inc., manufacturer of computer data entry, communications and editing terminals, for $10 million cash.

— — —

Zilog, Inc. has applied to the Philippines government Board of Investment to set up a wholly owned subsidiary in Manila to assemble integrated circuits. However, long-term plans call for Zilog Philippines, Inc. to operate as a microcomputer subsystem assembly facility.

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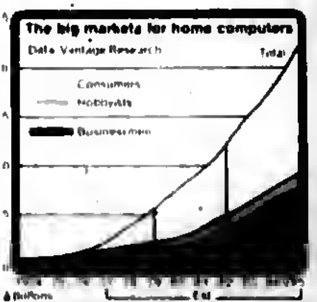

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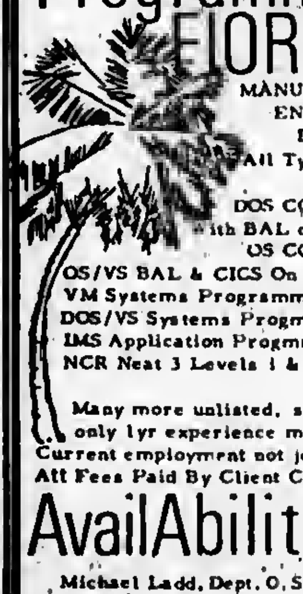

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Systems Software Analyst/

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Systems Software Analysts

Systems Software Programmers

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We have several positions open for competent computer system professionals with good analytical and communication skills to assist in the challenging job of clarifying and organizing the vast body of software design knowledge developed in support of Wang's new 32-bit Virtual Memory Computer Systems. As System Design Documentation Specialist, you'll develop system overview and program logic manuals, maintain functional reference manuals, and help coordinate the flow of product development information to our technical writing department. As collector, organizer, contributor, and editor of these formal technical communications, you'll help develop the common information base needed to support current and future development. By providing clear, organized information on current software structures, facilities, and conventions, you'll help us educate our fast growing research and development staff.

We're looking for capable individuals familiar with operating systems, compilers, data base management, or telecommunication systems, who enjoy creating lucid models and descriptions of otherwise complex structures. These positions offer excellent visibility and numerous possibilities for advancement within the corporation. Necessary qualifications include systems programming experience, competence in reading IBM 360/370 assembly language programs, good communication skills, and a desire for professional excellence.

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- A demonstrated knowledge of compiler or operating system architecture
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We offer excellent salaries and benefits. Please submit your resume including salary history and indicating position or positions of interest to Gary Blongiewicz, Manager Professional Recruiting, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851; or call him at (617)851-4111.

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SYSTEMS ANALYSTS

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  Support performance analysis of various communications and tracking links accessed by spacecraft/aircraft. Applicant should be familiar with TACAN, MSBLS, and HPS Systems, have the ability to develop and evaluate math models, have a high level of competence and written communications and have a knowledge of FORTRAN.
- **DIGITAL DESIGN ENGINEERS:**
  With experience in design and development of digital/analog equipment including computer interface, display control and signal conditioning hardware.
- **COMPUTER MAINTENANCE ENGINEERS:**
  To be cross-trained to support a large, diverse simulation laboratory. Facility includes analog computers, mini-computers and second and third generation medium-to-large scale systems manufactured by several companies.

Send resume in confidence to Bill Janeha at Lockheed Electronics Company, Dept. C-20-35, 1830 NASA Road
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77058.

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GTE Laboratories is the central research facility for all of the GTE Companies worldwide. If you are seeking an opportunity in a truly diversified environment with unusual opportunities to grow personally and technically you should investigate this position.

You will combine, interpret and edit technical information in the form of program listings and rough drafts to produce consistent, quality documents for distribution throughout GTE and the technical community at large.

You should have a BS degree, preferably a course in Computer Science and demonstrated writing ability plus basic knowledge of computers and programming.

We offer an outstanding compensation and benefits package including a company paid dental health plan. Our location is convenient to both Boston and the 128 area and our facilities and equipment are excellent.

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For a non-profit medical foundation with large research program, and academic orientation. Position involves responsibility for development of diverse applications (business, clinical and scientific) on an IBM System/3 m15D using RPG II, and CCP. Applicant should have at least 1 year experience in the above and be willing to perform some operations work.

We offer an excellent benefit program and salary commensurate with experience. Send resume including salary history to:

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Newton, MA. 02160

REAL TIME PROGRAMMER

Our financial organization located in the Mid-Atlantic area has an immediate opening for an experienced programmer. Qualified applicants will have financial application experience, working knowledge of COBOL, knowledge of telecommunication and assembler language, minimum 2 year degree. Experience with NCR computer helpful. Excellent career opportunities along with full company benefits. Salary is commensurate with experience. Forward your resume along with salary history to: CW box 1789, 797 Washington St., Newton, MA 02160.

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- Prior experience in performing and evaluating software and hardware feasibility studies
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These positions range from Senior Consultant to Management level, with rapid advancement opportunities. CPA Certificate required in some situations; CDP helpful in all positions. Salaries range from $22,000 to $40,000 depending on experience. Interviewing and relocation expenses will be paid. Positions are available in Chicago, Boston, Cleveland, New York, Baltimore, Seattle, Philadelphia, Houston, Dallas, Detroit, St. Louis, Minneapolis, Los Angeles, San Francisco and other locations.

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New York - (212) 758-5151; Houston - (713) 840-1032; Chicago - (312) 822-0444; Los Angeles - (714) 758-0515; or (213) 825-0781 Denver - (303) 779-4280.

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Coordinate all information processing and systems activities for a 487 bed Indiana Hospital. Requires demonstrable knowledge of hardware and and software utilized in hospital information systems, including information networks and the use of minicomputers as distributed processors. Masters degree in computer science or its equivalent in computer and information systems experience is required. This is a senior level position. Salary commensurate with experience.

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Welborn Baptist Hospital

401 S.E. 6th St.
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Electronics

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The Distributed Data Processing division of **Basic Four Corporation**, industry leader in small business computer systems, has an immediate requirement for a Senior Project Engineer to support continued development of its rapidly expanding Data Communications and Distributed Data Processing Product lines. This position requires **direct experience in the design and implementation of IBM 3270 Control Unit Simulation on mini- or micro-computer systems.** Successful candidate will also have as a minimum 3-5 years general experience in the data communications field and possess project management abilities. Salary commensurate with background and experience.

To find out more about this challenging career opportunity, call or send your resume, in confidence, to:

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Technical Human Resources Manager
(714) 731-6100, Ext. 1438

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We are seeking individuals with a background in any of the following areas:

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The University of Iowa, Department of Preventive Medicine and Environmental Health has an opening beginning November 1979 for programmer analyst to prepare complex computer programs and to design small systems in support of a Cancer Research Emphasis Grant. Minimum qualifications include a Bachelor's degree in Computer Science or a related field, or an equivalent combination of education and experience is necessary. Programming experience of at least one year, knowledge of system procedures and techniques, knowledge of Epidemiology and Statistical Analysis, i.e. design of experiment and regression analysis, multivariate analysis and time series analysis nonparametrics is necessary. Working experinece with PL/1, Fortran and Assembly experience with statistical packages, (SAS, SPSS, IMSL, BMD, SOUPAC) is necessary. Experience with IBM utilities is necessary. Experience in processing large data sets is necessary. Working experience with installation's operating system is highly desirable. $11,740 to $15,000. The University of Iowa is an equal opportunity affirmative action employer. Applications including up-to-date resumes and names of references should be sent to:

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Heath offers an attractive benefit package, competitive salaries, and a pleasant life style in a quiet community with outstanding recreational facilities on the shores of Lake Michigan.

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For this position, prefer experience with ACP Release 8.1 and beyond; and IBM 370/168 hardware. Familiarity with SVS in a PARS support role is a plus; Bachelors degree in Mathematics, Computer Science, Engineering required.

Starting salary approximately $2100 per month. If you are qualified for this position, and are seeking a competitive salary combined with excellent airline benefits, and suburban living, send your resume to:

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SYSTEMS ENGINEERING

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- Networking
- Project Leaders

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Previous experience with message, packet or circuit switching is a definite attribute for all positions.

Siemens, an international leader in electronics offers a comprehensive company paid benefits program including dental plan and life insurance, and provides an excellent work environment.

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SIEMENS

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Tampa, Fla. 33607 (813) 872-1853

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FOR COMPUTER SYSTEMS DEVELOPMENT

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Qualifications: Bachelor's degree is required, with 4 to 5 years experience in computer systems development with some significant managerial responsibility.

Minimum Salary: The salary is commensurate with education and relevant experience.

Closing Date for Applications: December 29, 1978.

Send letter of interest stating your minimum salary requirements, a resume including your salary history, an official transcript reflecting the highest degree earned, and the names of three professional references to:

Mr. Thomas W. Doctor, Director
Computer Center
Youngstown State University
Youngstown, Ohio 44555
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Valley National Bank of Arizona

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Duties and responsibilities include coordinating the development of long-range plans, monitoring performance management activities and providing technical evaluation of hardware and software acquisitions at major data centers.

The Coordinator will supervise an Assistant Coordinator for EDP Planning and an Assistant Coordinator for Technical Services and act as liaison with data center personnel engaged in these activities.

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Qualification Requirements: Bachelors Degree and minimum of five years EDP management experience. Experience in systems programming a plus.

Salary commensurate with experience and abilities. Excellent benefits. Send resume to:

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NCR Corporation,
Engineering and Manufacturing Division/Millsboro,
Dept. S50
Mitchell Road, Millsboro, DE 19966.

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To develop and implement a software reliability program with the objective of designing the reliability into the system. Will require candidates to be familiar with software development tools, such as structured programming, compilers, pre-processors, and structural testing principles. BSEE or BSCS required.

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We are an EOE/AA

Programmers Analysts Project Leaders

We have been retained by a no. of firms to assist them in their search for qualified Data Processing personnel. Client companies include manufacturers, banks, insurance companies, CPA firms and service bureaus. Positions available nationwide. If you have a minimum of 18 months exp. and are seeking professional and/or financial advancement, submit your resume, including salary history, in confidence to: Mary Woodruff, Sanford Rose Associates Personnel Consultants; 3301 Northland Drive, Austin, Texas 78731. ALL FEES ASSUMED BY EMPLOYER.

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Right now our progressive multi-lines insurance company, located in a beautiful New Hampshire town, has excellent opportunities for top EDP professionals. Our positions offer growth end high visibility plus the beneifts of living in New England close to skiing, hunting, camping and boating. Dpportunities ewaiting the right people include:

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PROGRAMMER/ANALYST - exposure to LIFE/70 or related Life processing system and ALC experience is required for this position with our growing EDP depertment.

Excellent fringe benefits and paid relocation, neturelly. If you're interested in leerning more about our EDP careers in beautiful New England, send resume including salary history to R. Cowie or cell him toll-free at 1-800-258-5340.

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programmer analyst

Picker Corporation, a major manufacturer of medical diagnostic equipment, has a need for an innovative, responsible EDP professional with a strong manufacturing background.

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To develop computerized product test programs for personal graphic computing systems. Assist in designing products with testability goals. BSEE or BSCS and knowledge of microcode, bit slice technology, mainframe system testing design experience desired.

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KMS FUSION, INC., Ann Arbor, Michigan, has an opening for a PDP-11 Real Time Systems Programmer. Applicant should have experience with PDP-11 computers, RSX-11M operating system, FORTRAN, Macro 11 and scientific programming. Basic knowledge of physics will be helpful. Responsibilities include: support and maintenance of existing laser fusion data acquisition system and data base; development of new on-line data acquisition capabilities and integration of new hardware; development of programs for image array processor; ability to work closely with scientific and technical staff to develop analysis programs.

Candidates must be U.S. Citizens and be abla to obtain a security clearance.

Send resume and salary requirements to:

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Applicants must heve 3 yr. experience in anginaaring DP systams develooment, and possess strong oral and written communication skills. Pluses are a BS in anginearing, and experience with comouter graohics and/or interactiva systams. Send detelled resuma and salary requirements to:

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We are also in need of several Systems Programmers with a minimum of 3 years experience on CDC 6000 and Cyber computers. Knowledge of CP and PP COMPASS assembly language a necessity. Position involves system support of a 6500 and Cyber 172 running the NOS/BE operating system.

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PROGRAMMER/ ANALYST

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Compensation for this position includes a base salary in the $75,000 range, plus stock options and bonus opportunity. And excellent fringe benefits package is included.

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Southern California Utility is seeking MVS System Programmer to support dual 370/158 CPU's. We desire experience in VSAM, TCAM, TSO, SMP and JES2. Minimum two years experience and a degree in math, computer science or equivalent is required.

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Located et the Augusta, Georgia, corporata headquerters tha position will supervise the design and implementation of management information systams in an on-lina data base, Burroughs B-3700 system.

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Will essume responsibility for computar operations and data entry on a 24 hour, 6 day schedule. This individual will have 5 yaars operations experianca on medium to large scale 370 systems. Two years experiance in a TP environment essentiel. We'll consider a laad operator/supervisor ready for menagement rasponsibilitias.

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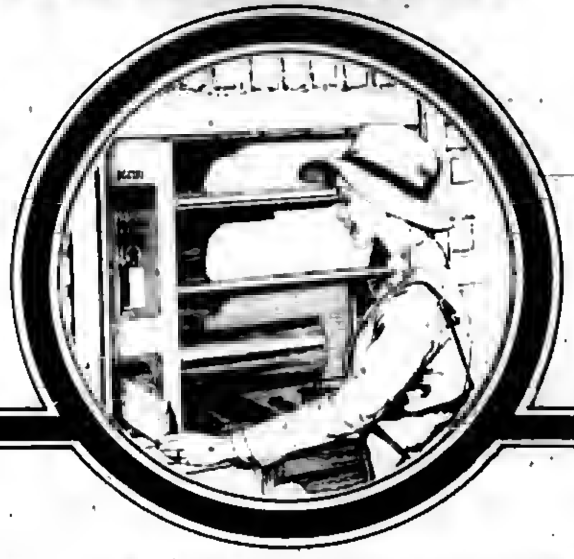

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Our small professional systems staff offers considerable opportunity for corporate visibility, and individual growth based on achievement. Our size maans taamwork is important; therafore, strong interpersonal skills are a must.

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This position calls for a thorough knowledge of COBOL and assembler lenguage and tha installation of DOS/VS CICS equipment. A knowladge of VSAM and DL1 is importent. Duties include troubleshooting and software products and the avaluation and programming of new generel purpose end specific software.

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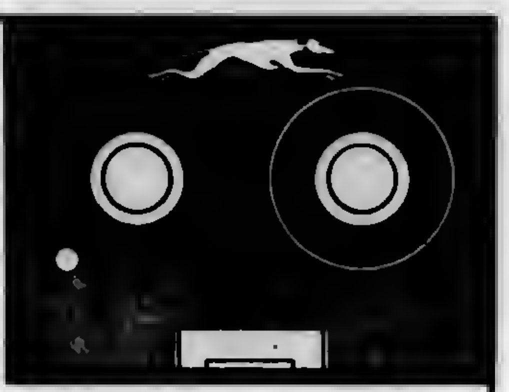

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HIGHLIGHTS:

Computer Eqpt.: IBM 360/40 consisting of IBM 2040-G, 128K processor, IBM 1052 Console · IBM 2540 Card Rdr. & Punch · (9) Potter 4314 Disc Drives · Potter 2406 Tape Drives · Potter 5803 Tape Controller · Potter 3403 Line Prtr. · CIG 40+ Memory System · IBM Mod. I Card Punch Control · Potter S314 Disc Control · Data-aire Mark IV Air Conditioner · Data Safe & Racks · Misc. Computer Eqpt.: (12) Data Point 2200 Tape Writers, (2) Centronics Data Prtrs., Memorex Viewers, Printers, Developer, Moore 400 Burster, Moore 284B Decollator.

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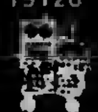

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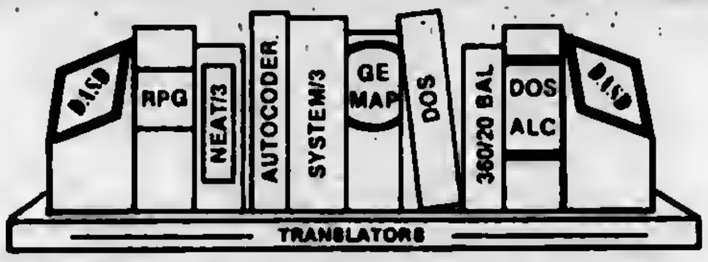

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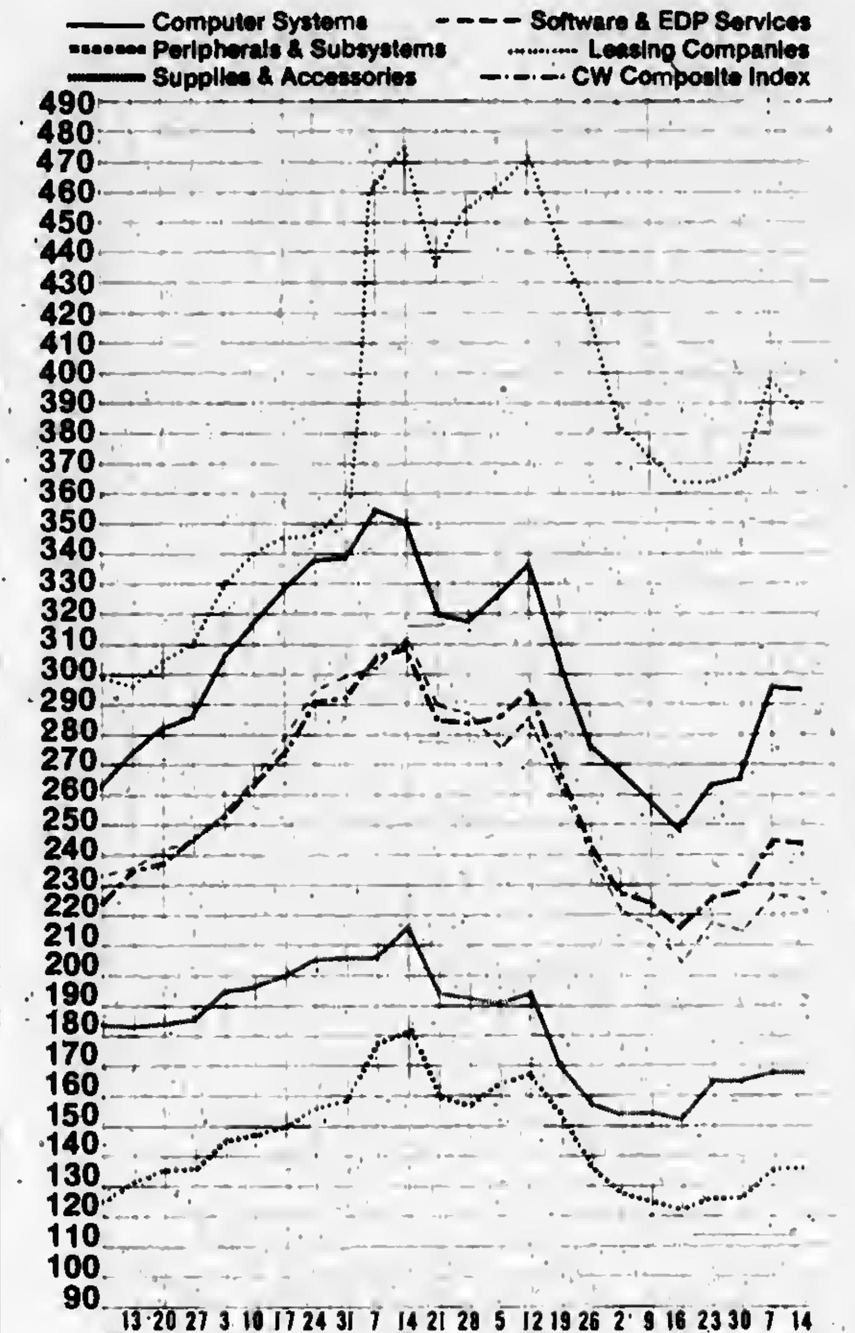

Earnings Reports

COMPUTERVISION
Three Months Ended Sept. 30

	1978	1977
Shr Ernd	$.85	$.31
Revenue	20,053,000	11,808,000
Earnings	1,644,000	750,000
9 Mo Shr	1.34	.79
Revenue	50,313,000	33,414,000
Earnings	3,329,000	1,887,000

DATA DIMENSIONS
Three Months Ended Sept. 30

	1978	1977
Shr Ernd	$.29	$.21
Revenue	4,368,000	2,968,000
Earnings	231,000	181,000
9 Mo Shr	.70	.42
Revenue	11,809,000	7,887,000
Earnings	550,000	320,000

DATA GENERAL
Year Ended Sept. 30

	a1978	a1977
Shr Ernd	$4.00	$2.88
Revenue	379,948,000	254,687,000
Earnings	40,281,000	28,578,000
3 Mo Shr	1.40	.99
Revenue	134,574,000	87,544,000
Earnings	14,312,000	8,868,000

a-53 weeks and 17 weeks, respectively.

FOXBORO
Three Months Ended Sept.30

	a1978	1977
Shr Ernd	$1.02	b$1.01
Revenue	97,022,000	94,507,000
Earnings	8,370,000	8,185,000
9 Mo Shr	2.75	b2.89
Revenue	284,097,000	287,880,000
Earnings	22,574,000	23,400,000

a-Includes the results of Analabs, Inc., acquired in February 1978, and Belsbaugh, Inc., acquired in April 1978. b-Adjusted for 50% stock dividend paid in December 1977.

PERKIN-ELMER
Three Months Ended Oct. 31

	1978	1977
Shr Ernd	$.48	$.24
Revenue	152,309,000	a115,593,000
Earnings	8,568,000	4,818,000

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 13, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

EXCH		PRICE			
		1978 RANGE (1)	CLOSE DEC 13 1978	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	28- 69	48 3/4	-3	-5.7
N	BURROUGHS CORP	59- 87	70 1/2	-3	-4.0
O	COMPUTER AUTOMATION	15- 44	22 1/4	+2	+9.8
N	CONTROL DATA CORP	23- 44	33 7/8	-1 1/2	-4.2
O	CRAY RESEARCH INC	8- 31	30 1/2	+2 1/2	+8.9
N	DATA GENERAL CORP	42- 71	60	-1 7/8	-3.0
N	DATAPOINT CORP	34- 75	66 1/4	+ 1/4	+0.3
N	DIGITAL EQUIPMENT	39- 54	50	- 5/8	-1.2
N	ELECTRONIC ASSOC.	2- 13	7	- 1/4	-3.4
A	ELECTRONIC ENGINEER.	9- 19	12	- 1/4	-2.0
N	FOUR-PHASE SYSTEMS	19- 46	30 1/2	- 3/4	-2.3
N	FOXBORO	28- 40	32 5/8	+1 1/2	+4.8
O	GENERAL AUTOMATION	7- 26	16 3/4	- 5/8	-3.5
O	GRI COMPUTER CORP	1- 3	1 1/4	0	0.0
N	HEWLETT-PACKARD CO	62- 93	86 7/8	- 3/4	-0.8
N	HONEYWELL INC	43- 72	66 3/4	-2	-2.9
N	IBM	236-305	274 1/4	-3 3/4	-1.3
O	MANAGEMENT ASSIST	9- 29	17 7/8	-1	-5.2
O	MANUFACTURING DATA S	9- 23	19 1/8	-1 5/8	-7.8
O	MICRODATA CORP	10- 23	18 3/8	- 1/2	-2.6
O	MINI-COMPUTER SYST	4- 8	6	- 1/4	-4.0
O	MODULAR COMPUTER SYS	7- 17	14 1/2	+4 1/4	+41.4
N	NCR	37- 67	60 7/8	-1 5/8	-2.5
N	PRIME COMPUTER INC	20- 43	31 1/2	+ 3/4	+2.4
N	PERKIN-ELMER	17- 29	27 1/4	- 3/8	-1.3
N	SPERRY RAND	33- 49	43 3/8	- 5/8	-1.4
A	SYSTEMS ENG. LABS	11- 24	14 3/8	- 1/4	-1.7
O	TANDEM COMPUTERS INC	13- 37	24 1/4	-1 1/4	-4.9
A	WANG LABS.	12- 32	28 3/4	- 1/4	-0.8
	LEASING COMPANIES				
O	BOOTHE COURIER CORP	13- 21	21 1/4	- 1/2	-2.2
O	COMDISCO INC	5- 22	14 3/4	- 1/4	-1.6
A	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	2 3/4	- 1/4	-8.3
O	CONTINENTAL INFO SYS	5- 15	7 1/4	- 1/4	-3.3
N	DATRONIC RENTAL	1- 3	2	0	0.0
A	DCL INC	3- 5	4 3/8	0	0.0
N	DPF INC	8- 14	11	+ 1/4	+2.3
N	ITEL	16- 36	25 1/2	- 1/2	-1.9
N	LEASCO CORP	24- 36	35	-1	-2.7
O	LEASPAC CORP	1- 4	2 7/8	- 1/4	-8.0
A	PIONEER TEK CORP	3- 7	3 1/8	0	0.0
N	U.S. LEASING	13- 20	15 1/2	0	0.0
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1	- 1/8	-11.1
O	ANACOMP INC	8- 22	11 3/4	0	0.0
A	APPLIED DATA RES.	8- 17	11	- 1/8	-1.1
N	AUTOMATIC DATA PROC	24- 36	31	- 3/4	-2.3
O	COLEMAN AMERICAN COS	1- 2	5/8	0	0.0
O	COMPU-SERV NETWORK	6- 12	5 3/4	0	0.0
O	COMPUTER HORIZONS	1- 9	7	+1 1/4	+21.7
O	COMPUTER NETWORK	6- 16	6 5/8	- 1/4	-3.6
N	COMPUTER SCIENCES	8- 17	11 3/8	-1 1/2	-11.6
O	COMPUTER TASK GROUP	1- 4	4 1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 1/2	+ 1/4	+11.1
O	COMPUT AUTO REP SVC	4- 10	6 1/4	+ 3/8	+6.3
O	COMSHARE	6- 19	15 1/4	0	0.0
O	CULLINANE CORP	14- 33	17 1/4	-1 3/4	-9.2
O	DATA DIMENSIONS INC	4- 9	5 1/4	- 3/8	-6.6
O	DATATAB	1- 2	7/8	0	0.0
N	ELECTRONIC DATA SYS.	15- 25	19 5/8	- 1/8	-0.6
O	INSYTE CORP	1- 3	1 1/8	+ 1/8	+12.5
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 3/4	+ 1/4	+5.5
O	KEYDATA CORP	1- 3	1 5/8	- 1/8	-7.1
A	LOGICON	10- 19	11 5/8	0	0.0
A	NATIONAL CSS INC	15- 36	24 7/8	-1 5/8	-6.1
O	NATIONAL DATA CORP	7- 13	8 5/8	- 3/8	-4.1
A	ON LINE SYSTEMS INC	12- 30	17 3/4	+ 1/2	+2.8
N	PLANNING RESEARCH	4- 10	6 5/8	- 3/8	-5.3
O	PROGRAMMING & SYS	1- 1	1 3/8	- 1/8	-8.3
O	RAPIDATA INC	3- 7	4 3/8	0	0.0
O	REYNOLDS & REYNOLD	18- 36	28 1/4	- 3/4	-2.5
O	SCIENTIFIC COMPUTERS	3- 9	5 3/4	- 3/8	-6.1
O	TYMSHARE INC	18- 33	25 1/4	-1 1/8	-4.2
A	URS SYSTEMS	5- 8	6 1/8	- 3/8	-5.7
N	WYLY CORP	1- 7	4 1/2	+ 1/2	+12.5
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	14- 32	23	-1 1/2	-6.1
O	ADVANCED MEMORY SYS	7- 18	13 5/8	- 1/4	-1.8
N	AMPEX CORP	10- 19	15 1/2	- 1/8	-0.7
O	ANDERSON JACOBSON	5- 10	5 3/4	- 1/2	-8.0
N	APPLIED DIG DATA SYS	9- 22	10 1/8	- 1/4	-2.4
O	BEEHIVE INT'L	3- 7	3 3/4	0	0.0
A	BOLT,BERANEK & NEW	6- 14	12 7/8	+2 1/8	+19.7
N	BUNKER-RAMO	10- 20	15	+ 3/8	+2.5
A	CALCOMP	3- 13	5 3/4	- 7/8	-13.2
O	CAMBRIDGE MEMORIES	3- 9	5	+ 5/8	+14.2
N	CENTRONICS DATA COMP	16- 37	22 5/8	-1 3/8	-5.7
O	COGNITRONICS	1- 4	2	0	0.0
O	COMPUTER COMMUN.	6- 87	5 7/8	+ 3/4	+14.6
O	COMPUTER CONSOLES	4- 10	7 3/4	- 1/2	-6.0
A	COMPUTER EQUIPMENT	3- 6	3 7/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	4 1/8	- 1/8	-2.9
O	COMPUTERVISION CORP	9- 30	21 1/4	+ 1/4	+1.1
O	CONTEN	9- 38	14 1/2	0	0.0
N	CONRAC CORP	13- 26	14 1/4	-1 1/4	-8.0
O	DATA ACCESS SYSTEMS	3- 14	11	0	0.0
O	DATA 100	9- 20	19 1/2	- 1/4	-1.2
A	DATA PRODUCTS CORP	14- 25	17 3/4	- 1/4	-1.3
O	DATUM INC	2- 6	2 1/2	- 1/8	-4.7
O	DECISION DATA COMPUT	2- 6	2 3/4	- 3/8	-12.0
O	DELTA DATA SYSTEMS	1- 1	3/4	+ 1/8	+20.0
A	DOCUMATION INC	6- 34	22	- 3/4	-3.2
O	DATARAM CORP	6- 32	18 1/2	-1	-5.1
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O	FABRI-TEK	1- 2	7/8	- 1/8	-12.5
O	GENERAL COMPUTER SYS	1- 3	1 7/8	+ 1/8	+7.1
O	GENERAL DATACOMM IND	9- 21	15	+2 1/4	+17.6
N	HAZELTINE CORP	10- 17	11 1/2	- 1/2	-4.1
N	HARRIS CORP	17- 36	32 1/4	- 1/4	-0.7
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O	INFORMATION INTL INC	7- 12	6 1/2	- 3/4	-10.3
O	INFOTON	1- 3	2 3/4	+ 1/8	+4.7
O	INTEL CORP	39- 62	49	-3 1/2	-6.6
A	LUNDY ELECTRONICS	4- 8	4 3/4	+ 1/2	+11.7
O	MSI DATA CORP	10- 19	11	+ 1/4	+2.3
N	MEMOREX	27- 59	28 7/8	-2 3/8	-7.5
N	MOHAWK DATA SCI	6- 15	9 1/2	- 3/8	-3.7
O	ONEK	2- 6	5 1/2	0	0.0
O	PARADYNE CORP	9- 17	10 3/8	+1 1/4	+13.6
O	PENRIL CORP	5- 12	8 3/4	- 1/2	-5.4
N	PERTEC CORP	9- 17	12 1/2	+ 1/4	+2.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	8	- 1/8	-1.5
O	SCAN DATA	1- 5	1 7/8	-	-3.1
N	STORAGE TECHNOLOGY	19- 46	30 3/8	- 1/2	-1.6
O	T BAR INC	11- 20	16 1/4	+1 3/4	+12.0
O	TALLY CORP.	4- 14	13 3/4	0	0.0
A	TEC INC	6- 13	7	+ 5/8	+9.8
N	TEKTRONIX INC	33- 50	46 1/4	-1 1/2	-3.1
N	TELEX	3- 9	5 1/2	+ 1/4	+4.7
O	TESDATA SYSTEMS CP	9- 23	10 1/4	+ 3/4	+7.8
O	WILTEK INC	1- 2	1	0	0.0
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS PRODS	6- 11	7 1/2	- 3/8	-4.7
O	BALTIMORE BUS FORMS	2- 4	1 1/2	0	0.0
A	BARRY WRIGHT	14- 30	26 1/2	+ 3/4	+2.9
O	CYBERNATICS INC	1- 1	1/2	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	17 1/8	+ 1/8	+0.7
N	ENNIS BUS. FORMS	8- 17	11 7/8	+ 1/4	+2.1
N	3M COMPANY	43- 66	61 1/8	- 3/8	-0.6
O	MOORE CORP LTD	26- 34	28 1/4	0	0.0
N	NASHUA CORP	18- 37	24 5/8	- 7/8	-3.4
O	STANDARD REGISTER	20- 27	23	- 3/4	-3.1
A	TAB PRODUCTS CO	8- 16	10 1/4	+ 1/4	+2.5
N	UARCO	19- 50	49 1/4	+2	+4.2
A	WABASH MAGNETICS	10- 22	14 5/8	- 7/8	-5.7
N	WALLACE BUS FORMS	18- 33	23 5/8	- 3/8	-1.5

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NEWSPAPER

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M Hikes Dividend, Plans Stock Split

ARMONK, N.Y. — IBM's board of directors has given the company's stockholders a two-fold Christmas gift: a quarterly cash dividend of $3.44 per share on its common stock and a four-for-one stock split, which will be recommended at the annual meeting scheduled for April 30.

The latest dividend represents an increase of 56 cents from the former quarterly rate. The dividend is payable March 10 to holders of record Feb. 14.

"This action brings IBM's stock to a more competitive posture with stock of other quality companies, and we hope the new price will be attractive to small investors," an IBM spokesman said.

The stock split would be made effective by issuing three additional shares of IBM stock for each share held as soon as possible after May 10, the tentative date for the split.

Although IBM has not split its stock for the last six years, the move was expected, according to Harry Edelson, vice-president of research at Drexel Burnham Lambert, Inc.

After the split, the stock's lower price will make it a more marketable commodity on Wall Street, Edelson noted. "In an age of consumerism, it might be embarrassing to be reporting earnings per share of $25 when other firms are reporting $1 or $2 per share," he added.

Some DPers May Be Exempt From 7% Lid on Pay Raises

By Marcia Blumenthal
CW Staff

WASHINGTON, D.C. — There might be good news for DP personnel in a recent ruling that has modified President Carter's request that employers hold salary increases to 7%.

Job categories for which employers can document labor shortages have been exempted from the 7% ceiling by the Council on Wage and Price Stability. While no formal announcement of shortages in the DP sector has been made, those jobs listed in "Occupations in Demand at Job Service Offices," a monthly publication of the U.S. Department of Labor, are usually considered hard to fill.

In November, the publication listed 750 jobs available in the business programmer and systems analyst categories. Six hundred of those jobs were still unfilled at the end of November, an official of the U.S. Bureau of Labor Statistics reported.

Connecticut, New York, Virginia and parts of Minnesota are experiencing particular shortages in those job categories, the bureau said.

The Council on Wage and Price Stability's exemption regulation stipulates that raises in excess of 7% may be granted when such increases are "necessary to attract or retain employees in a particular job category because of an acute labor shortage," provided certain conditions are met.

Criteria for Shortages

According to the regulation, labor shortages exist if:

- The proportion of vacancies during the previous quarter has increased abnormally from the vacancy rate experienced in the prior two years.
- The time required to fill vacancies has increased abnormally from that required during the previous two years.
- Pay rates for entry level personnel have increased abnormally from the usual starting pay of the prior two years.
- The local employment service agency has certified that an acute labor shortage exists.

Various employment surveys have indicated that the demand for DP specialists has grown quickly, perhaps outpacing the supply. A recent survey by National Personnel Consultants [CW, Aug. 14] showed the demand for DP specialists grew 21.7% since 1977 and salary increases exceeded 12% for the same period.

A survey by the Association for Systems Management [CW, July 3] found the median salary for systems analysts had grown from $18,749 in 1974 to $24,786 in 1977 — a 32% increase. That study also indicated that a growing number of systems analysts have

(Continued on Page 4)

Conversational Editing, RJE

'Prepso' Backs IBM Programmers

By Don Leavitt
CW Staff

SAN FRANCISCO — Continuing the line of support it started with the introduction of the Maestro programmer workstation [CW, Oct. 9], Itel Corp. last week announced the availability of the Prepso conversational text editing and remote job entry (RJE) programming system.

Developed by Armaggedon Associates of Danville, Calif., Prepso is available for use under IBM's OS/VS1 on 370 series or compatible mainframes. It is being adapted to the MVS environment and that implementation should be ready by the end of the first quarter of 1979, according to an Itel spokesman.

The product is a reentrant system, allowing concurrent use by as many terminal users as the host computer can support. There is nothing within the Itel software that imposes a limit on the number of programmers who can use it at the same time, the spokesman claimed.

The software enables users to create data files and to write and compile programs conversationally at local or remote terminals — CRT or hard-copy — and then to trigger execution of the programs on an RJE basis.

While that in itself is not unique — the spokesman readily named Roscoe from Applied Data Research, Inc., for example, as a competitor — Prepso does have some advanced capabilities. For instance, it allows terminal users to track where their work is in the sub-

(Continued on Page 8)

Univac Extends Top of Mini Line

By Jeffry Beeler
CW Staff

IRVINE, Calif. — Univac recently expanded its V77 minicomputer series with a high end system that reportedly provides twice the processing power of the family's previous top-of-the-line model.

At a recent press conference here, Univac officials described their latest minicomputer system, the V77-800, as an evolutionary extension of the V77 family, which the company acquired more than 18 months ago from Varian Data Machines. The three smaller members of the V77 family include, in ascending order, the V77-200, 400 and 600 systems.

As part of the V77-800's unveiling, Univac also introduced a multitasking, terminal-oriented operating system called Summit (see Page 25) and announced the extension of Distributed Communications Architecture (DCA) to both the V77-600 and 800. Summit runs on the two largest V77 models and supports Pascal as well as the QL/77 inquiry/update language, according to a Univac spokesman.

In computing power, the V77-800 falls somewhere between Digital Equipment Corp.'s PDP-11/70 and its VAX-11/780, the spokesman explained. The Univac high end mini is also said to belong to the same product class as the larger models of the Data General Corp. Eclipse line.

Suited for both commercial and scientific applications, the V77-800 reportedly serves as a stand-alone system, front-end processor or as part of a distributed processing network built around Univac 90, Univac 1100 or IBM 370 series mainframes.

(Continued on Page 8)

U.S. vs. IBM Could End Next Year

By Connie Winkler
CW Staff

NEW YORK — The U.S. vs. IBM antitrust trial, now in its fourth year here, could end in late 1979, according to one source close to the case — and it might go to the judge sooner than that, thanks to the technique of narrative statements now being tried.

Even Judge David N. Edelstein, who's been sitting alone through it all, has seen what was inconceivable until recently — the light at the end of the tunnel. In a chambers conference this month, Edelstein said real progress has been made in the trial.

Robert J. Staal, who is in charge of the Justice Department's case, believes the trial could wind up in 12 to 18 months, especially if the attrition rate of IBM witnesses continues. IBM intended to call about 200 witnesses (the government planned 190), but it has pared its list to 45 or 50.

Thomas D. Barr, IBM's lead attorney, won't predict how long the trial is going to run, even though he is enthusiastic about the use of narrative statements to present witnesses' direct testimony. "Every projection I have made in this case has been wrong," Barr said.

(Continued on Page 4)

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NCIC Lists New York's 'Wanted,' But City Doesn't Want Them All

By Tim Scannell
CW Staff

NEW YORK — Limited by tight municipal budgets, judicial officials here are refusing to extradite certain individuals accused of crimes committed in New York City but apprehended in other states after being listed in the National Crime Information Center's (NCIC) data bank.

A number of police officials have complained about New York City's shoe-string use of the nationwide system. NCIC guidelines stipulate that if a police department knows ahead of time it will not extradite an alleged felon, it should not enter the record into the system.

If the extradition process is canceled for any reason, the fugitive's file should immediately be purged from the computer, according to Frank Buell, chief of the Federal Bureau of Investigation's NCIC network.

"As long as a suspect is a fugitive and still on the loose, he will remain in the system," Buell noted.

Criteria for Extradition

New York City district attorneys are selecting individuals for extradition according to the severity of the crime, the amount of substantial evidence, the willingness of the complainant to testify and the availability of funds, Manhattan Assistant District Attorney Leonard Rienzi said.

"Obviously, if it's a serious case and if we can prove beyond a reasonable doubt that [the defendant] will go to state prison . . . then we're likely to bring him back from another jurisdiction," Rienzi explained. But "it doesn't pay for us to spend $500 or $1,000 bringing someone back from Washington or Florida or Chicago only to have him come in here and get a $25 fine."

New York City's pick-and-choose philosophy has already affected the operations of several police departments across the country that have suffered embarrassment and faced the possibility of a released individual filing false arrest charges.

"There are always risks involved in arresting fugitives, so it's kind of a letdown when the other jurisdiction says it doesn't want the guy," William McGill, chief of the Washington, D.C., fugitive squad, said. Each year his 13-member unit encounters close to 2,000 fugitives wanted in other jurisdictions, while he said he couldn't estimate how many extraditions are refused, he maintained that New York City is by far the biggest offender.

McGill's unit recently dealt with New York City in a case concerning a 20-year-old who, according to the NCIC record that was routinely pulled when the suspect was stopped for a minor traffic violation, was wanted in Manhattan for homicide. After further investigation, McGill discovered that New York City authorities not only didn't want to extradite the suspected felon, but that the charge was really attempted homicide.

New York police told McGill that the charge against the defendant would probably be reduced to assault and that the case wasn't worth the expense of extradition.

Det. Harry Balian of the Maricopa County (Ariz.) Sheriff's Office has also experienced New York City's extradition refusals and shares McGill's apprehension about the city's NCIC records. "New York and New Jersey are pretty good for making entries [into the NCIC] and then not extraditing on them, even though the entry is valid and the warrant outstanding," Balian said.

The district attorneys of those states complain of the substantial amount of money needed for extraditions and "will usually reduce the charge to in-state-only pickup," Balian stated.

New York just doesn't have the money or the time to chase every single fugitive, assistant district attorney Rienzi said. He pointed out that in Manhattan alone, roughly one-fourth of the 100,000 defendants arrested each year jump bail.

A district attorney's office has no control over updates or purges of NCIC records, he added. That responsibility lies with the arresting police department but, because of New York City's financial problems, file changes and deletions may be backlogged.

Precautionary Measures

Several police departments in the nation have instituted precautionary measures in handling NCIC arrests to avoid embarrassing situations and complicated false arrest suits. Most go out of their way to gather information about a warrant, its date of inception and who authorized it.

In a few cases, in order to avoid rearresting an individual a state has refused to extradite, the out-of-state officers will remove or alter an outstanding record — although this is in violation of NCIC rules.

In general, however, most will have to play it by ear when dealing with states that consistently refuse to follow up on fugitive extraditions. In the future, "we will get the information as to where the individual [listed in the NCIC] stands and notify New York City, and if it does not respond within a certain period of time, then we won't even arrest the man," McGill said.

Note to Subscribers

This is *Computerworld*'s annual combination issue, carrying the dates of Dec. 25 and Jan. 1.

Our next regular publication will be dated Jan. 8.

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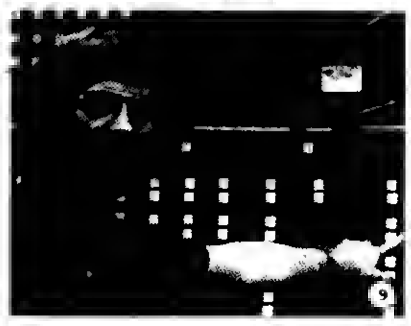

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IBM-Compatible CPUs Proliferate in Past Year

Review & Forecast

By E. Drake Lundell Jr.
CW Staff

Some of the biggest news for users in 1978 was a mind-boggling array of IBM software-compatible mainframes as manufacturers of the gear seemed to pop up almost monthly.

And the established manufacturers of software-compatible processors — Itel Corp. and Amdahl Corp. — reached new highs in shipping rates, making the two vendors, when taken together, the largest independent makers of IBM 370/158 and above size systems.

Both of these trends will have repercussions that will ripple through the computer community for years to come.

At the end of 1977, users had only Amdahl and Itel offering plug-compatible alternatives to IBM mainframes, and they were both clustered at the high end of the IBM range. In quick succession during the year, however, other plug-compatible manufacturers entered the arena, bringing out machines that compete with the entire 370 line of equipment — machines they hope will be competitive with the E series of mainframes that IBM is expected to announce during the first quarter of 1979.

On the low end, users got an alternative to the IBM 370/115, 125 and 135 with the Cambridge Memories, Inc. models 1, 2 and 3 software-compatible processors.

Moving up, there was a great deal of action in the 370/138 arena, with Nanodata Corp. offering its VMX200, Magnuson Systems Corp. pushing the M80/3, National Semiconductor Corp. wading in with the Model 400, National CSS, Inc. (NCSS) offering the Two Pi Co. processors packaged with NCSS software as the 3200 system, Itel offering the AS/3-3, Citel Corp. pushing its 30 Model 3 and Control Data Corp. introducing the Omega 480-I.

In the 370/148 class, almost all of those players were again represented: Itel with the AS/3-4, AS/4 and AS/5-1; CDC with the Omega 480-II, Nanodata with the VMX400, Citel with the 30 Model 4 and Magnuson with the M80/4.

At the upper end of the line and competing against the newer IBM 30 series of computers, Itel and Amdahl remained the only ones in the ring — Itel with the AS/5-3, 7031, AS/6-1 and AS/6-2 competing with the IBM 158-3, 3031, 168-3 and the 3032, respectively.

Amdahl stuck to its niche at the large end, with the 470V/5, V/5-II, V/6 and V/6-II competing with the 370/168-3 and the 3032 and with the 470V/7 and V/8 offering competition against the top-of-the-line IBM 3033.

So, from two alternative sources of software-compatible processors at the beginning of the year, the number grew to eight, and the range of independent alternatives spread from the high end of the line down through the entire IBM 370 line.

While the effects of the increases in IBM-compatible CPUs cannot be seen at this time, the entry of so many firms into the field — and the success of the most established players in the field — raised tricky questions both for users and for the more established mainframe makers such as Burroughs Corp., Univac, Honeywell, Inc., CDC and NCR Corp.

U.S. vs. IBM Trial Could End in '79

(Continued from Page 1)

Nevertheless, the optimistic predictions are revolutionary in this case, which has spanned more than 575 court days and spawned 86,000 pages of transcript. It took the government three years to go through 52 witnesses, with one witness on the stand 78 days. IBM started presenting its witnesses when the government rested its case on April 26; despite a month's recess, the firm has already gone through 14 witnesses.

What has speeded up the trial so dramatically is a technique for the introduction of direct testimony from IBM witnesses with a narrative statement, instead of through questioning by lawyers. Both sides negotiate the narratives beforehand.

The testimony of the past seven witnesses has been completed in 18 court days, although those 18 court days were spread over a two-month period. Without the narratives, the witnesses might have taken seven or eight weeks of court time, Edelstein noted.

Submitting the narratives in writing to the court, plus preliminary questions, can take as little as 20 minutes. Before the narratives, direct examination took days; one witness this summer took 11 days. The testimony was frequently rambling and interrupted with intense objections from both sides.

"The narratives are really unique because what you have seen accomplished is the direct examination, with but preliminary clarifying statements, in an exceedingly short time," the judge said. "The narratives are one of the most forward steps I have seen in any complex case."

He predicted they will be used in the future in complicated litigation. U.S. vs. IBM will provide the precedent for other judges to implement the technique, he added.

This is the first trial where such narratives have been used in precisely this way. Written statements are often used in hearings before federal and state agencies, such as the Federal Trade Commission or a state's Public Service Commission. However, any kind of statement — including hearsay — can be made in those agency statements, and there is no negotiation of the statement by the adversaries before presentation, Edelstein pointed out.

Edelstein has been enthusiastic enough about the narrative technique — even though its use has been limited in the IBM trial — to recommend it to the Presidential commission studying antitrust actions.

Edelstein, who has been criticized for his slow handling of the trial, said he seized upon the narrative technique this fall when faced with an apparently unending controversy over the topic of an upcoming IBM witness' testimony. Edelstein has used the technique in criminal trials with expert witnesses — for example, a chemist called to testify that a powder in a glass envelope was not flour but the controlled substance taken at the time of an arrest.

The narrative not only allows the witness to put his thoughts on paper in an organized and thoughtful fashion, but it allows both sides to eliminate major objections to a witness' testimony. However, there are still many objections voiced in court.

"On balance, it's a very good technique that's working well," Staal said. He added that "we aren't terribly pleased that we're not on a full schedule." To allow Cravath, Swaine & Moore — IBM's counsel — time to prepare the narrative statements, court has been meeting two to four days a week.

With one recent witness, the government agreed to eliminate the deposition usually taken beforehand with both parties present where attorneys determine the parameters of what the witness would say in court. "We're committed to evaluate everyone, and it may well be that we can eliminate a deposition — we have to wait until we see the narrative," Staal said.

When Barr originally agreed to the narratives, he asked that the depositions be discontinued. Staal would not agree to that.

Negotiations to get both parties to accept the narrative technique were like the Arab-Israeli talks at Camp David, one trial observer remarked.

"Both sides should be congratulated because they permitted me to pressure them to accept this experiment," Edelstein said.

Exemption Lifts Ceiling On Some DPers' Raises

(Continued from Page 1)

switched jobs rather than stay at one company, which adds to the recruitment problems facing firms.

The push for the exemption was spearheaded by the American Electronics Association's (AEA) special Wage/Price Task Force. Spurred by the acute labor shortages in high-technology industries, Roy J. Brandt, vice-president of human relations at National Semiconductor Corp. and chairman of the 10-member task force, recently met with Barry Bosworth, director of the Council for Wage and Price Stability.

At that meeting, the AEA presented Bosworth with specific proposals for the exemptions.

After narrowing down the AEA's proposals to the labor shortage issue, Bosworth charged the task force with drafting an exemption regulation. The final regulation, passed Dec. 12, incorporates most of the AEA's recommendations, an association spokesman said.

Although the exemption was prompted by AEA concerns, the regulation does not restrict the pinpointing of labor shortages to the electronics industry. Jobs eligible for exemptions will be developed as shortages are discovered, the AEA spokesman explained.

The procedures for administering the exemption program have not yet been determined. However, companies with personnel shortages that meet the labor shortage criteria can make direct inquiries to the Council on Wage and Price Stability.

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Other DP-Tied Bills to Resurface

Privacy Emphasis Expected in 96th Congress

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Several pieces of legislation of great interest to the DP community died as the 95th Congress ended its legislative session in October.

Although some of those bills, covering such topics as computer crime, transborder data flow and telecommunications, are expected to be reintroduced next month, early in the 96th Congress, privacy will probably be the main information policy thrust of the new Congress. Indeed, the 96th Congress is already being referred to here as "the privacy Congress."

Although almost 200 bills addressing the privacy issue were introduced in the last congressional session, little legislation in this area made it to the President's desk — with the notable exception of the Right to Financial Privacy Act [CW, Oct. 23].

The Administration and several influential members of Congress hope to amend that shortcoming in the next two years. The President's "privacy initiative" — an attempt to pass into law recommendations of the Privacy Protection Study Commission — has already identified several privacy topics the President wants Congress to address.

Preyer's Effort

As a result of the initiative, the Administration will reportedly recommend legislation covering medical, insurance and credit records privacy [CW, Dec. 11]. In addition, Rep. Richardson Preyer (D-N.C.), chairman of the House Subcommittee on Government Information and Individual Rights, said his committee will most likely address similar elements of the privacy issue.

In a recent interview on "What's the Issue?" — a radio show produced by the Chamber of Commerce of the United States — Preyer said the Omnibus Right to Privacy Act he introduced in the last session of Congress [CW; Nov. 21, 1977] was "introduced for discussion purposes" and "is not the proper legislative vehicle."

The bill, which incorporated a dozen pieces of legislation introduced as a result of the privacy commission's final report, is "too complex" and "too long" to adequately solve the privacy problems identified in that report, Preyer said.

"What will happen," he theorized, "is we will be breaking off individual pieces of it," and he mentioned medical and insurance company records as possible targets for separate bills.

Communications Act Rewrite

A major piece of legislation of interest to the DP and telecommunications industries is the Communications Act of 1978, which was introduced in the House last June by Rep. Lionel Van Deerlin (D-Calif.) and in the Senate by Ernest F. Hollings (D-S.C.)

Hearings were held through the summer on the bill, which would amount to a full rewrite of the Communications Act of 1934. The legislation is now undergoing revision in preparation for its reintroduction, expected by early February, according to a spokesman for the House Subcommittee on Communications, of which Van Deerlin is chairman.

Another bill of interest to the DP community is the Federal Computer Systems Protection Act, introduced in June 1977 by Sen. Abraham Ribicoff (D-Conn.). Only a few days of hearings have been held on the measure, but it has the endorsement of several influential senators, including Charles H. Percy (R-Ill.), Henry M. Jackson (D-Wash.) and Edward M. Kennedy (D-Mass.).

The bill, strongly supported on the House side by representatives Charles Rose (D-N.C.) and Robert F. Drinan (D-Mass.), would make it a crime to misuse the computer systems of the federal government, certain financial institutions and other entities involved in interstate commerce.

Review & Forecast

Punishment for such offenses would be up to 15 years in prison, $50,000 in fines or both. The bill will be reintroduced in both houses early next year with "minor revisions" suggested by the Justice Department, according to a member of Ribicoff's staff.

On the international scene, observers here expect Rep. Barry M. Goldwater Jr. (R-Calf.) to reintroduce, early in the next session, his resolution calling for the President to convene an International Conference on Communications and Information [CW, Oct. 16].

The new Congress is also expected to take up the question of whether the U.S. Postal Service should be involved in electronic mail. Other bills that DP industry representatives hope to see reintroduced include legislation to extend copyright protection to semiconductor chip designs and a bill to extend the criminal code to define "property" as including software and computer data.

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Heavy EFT Traffic, Related Crime in '78 Stimulate Concern Over Bank's Security

By Brad Schultz
CW Staff

While electronic funds transfer (EFT) traffic mounted steadily through 1978, a rash of large dollar EFT crimes during the year fueled criticism that bankers don't appreciate how vulnerable computerized financial networks are to abuse.

Congress found that EFT "provides the potential for substantial benefits to consumers. However, because of the unique characteristics of such systems, the application of existing consumer protection legislation is unclear, leaving the rights and liabilities of consumers, financial institutions and intermediaries in [EFT] undefined."

Basic Framework Set

This conclusion in the recently signed EFT Act — an amendment to the Consumer Credit Protection Act — sets the "basic framework establishing the rights, liabilities and responsibilities of participants in [EFT] systems" [CW, Oct. 23].

The act directs the Federal Reserve System's Board of Governors to propose EFT regulations to Congress, regularly assess the economic impact of EFT, oversee the rights of EFT consumers and consult with such agencies as the Treasury Department's Comptroller of the Currency in preparing for the "continuing evolution" of EFT services and technology.

In effect, the act recognizes the board as the single source of federal EFT policy direction.

Act's Stipulations

Bankers must clarify the terms and conditions of EFT transactions to the consumer, according to the act, and banks are responsible for keeping consumers informed of any changes in these provisions.

Furthermore, the act requires documentation of all EFT transactions and prescribes a procedure for resolving EFT processing and transmission errors. It also defines the liability of banks and consumers in cases of unauthorized EFT and sets forth penalties for criminal abuse.

Finally, the act forbids "compulsory use" of EFT. No public agency or private firm may now refuse to extend credit or withhold employment or government benefits because an individual declined to receive EFT payment.

Fedwire Link

Last spring, the Justice Department objected to the Federal Reseve Board's plans to create a nationwide link of automated clearinghouse (ACH) via the Federal Reserve Communications System (Fedwire). The department termed the plans "an unwarranted intrusion into an area of developing technology that should be left to the private sector."

However, Justice did approve EFT between Federal Reserve Banks through the Bankwire network [CW, April 24]. Several months later, the board announced completion of a Fedwire link of 35 regional ACH serving about 9,400 commercial banks, 1,500 thrift institutions and 6,000 customer corporations affiliated with ACH associations [CW, Oct. 23].

Bankwire II, the successor to the original Bankwire service, was announced in August. Typically handling daily transactions in excess of $20 billion now, the private-line network includes two computerized message-switching centers. Redundant mainframes are at two sites and programmable channel termination groups act as remote concentrators for 48 communications lines [CW, Sept. 4].

Review & Forecast

Use of the federal Data Encryption Standard (DES) "as a security element in the encoding of magnetic stripes on bank cards" was formally endorsed by the American Bankers Association (ABA) earlier this month.

Security Technique

The endorsement means that banks are encouraged to use DES as a security technique, the ABA explained. The standard was said to offer the "best combination of security and ease of implementation known at this time for an electronic transaction interchange environment."

Developed by IBM and approved last year by the National Bureau of Standards, the DES algorithm is central to data security products introduced by several vendors this year [CW, Jan. 9].

Encryption entails electronic "scrambling" of sensitive data prior to transmission and unscrambling upon reception by an authorized party; thus, data intercepted en route is rendered incomprehensible. EFT applications are generally considered the most pressing market area for encryption vendors.

Controversy Raged

A controversy surrounding IBM's algorithm — critics claim it can be broken [CW, Jan. 30] — raged throughout 1978 but did not deter IBM, the Government Electronics Division of Motorola, Inc. and other vendors from trying to sell DES products to help ensure EFT network security.

For example, Motorola recently closed a deal with the Institutional Group Information Corp., a consortium representing the DP interests of 12 mutual savings banks in the metropolitan New York area, to install its Infoguard family of DES products in conjunction with a Burroughs Corp. B6700 fail-soft CPU. The equipment will safeguard deposit accounting transactions in an on-line, real-time environment.

'Stark Terror' Needed

At the recent Association for Computing Machinery (ACM) annual convention, ACM President Daniel McCracken remarked that more "stark terror" may be needed before U.S. bankers appreciate how vulnerable EFT networks are to abuse.

McCracken and others at a session that probed whether EFT is "moving too fast" for some declared that most bankers are ignorant or apathetic about encryption and security of the physical DP node in an EFT network [CW, Dec. 18].

Fedwire and the California-based Security Pacific Bank experienced two breaches of EFT security this year. This summer, an attempted embezzlement of $140,000 was reported [CW, Aug. 14] that involved impersonation and misuse of a Fedwire identification code.

During November, the year's most notorious computer crime occurred. In another Fedwire-related case, a self-employed computer consultant, Stanley Mark Rifkin, allegedly negotiated a $10.2 million heist from a Security Pacific branch and then purchased diamonds in Switzerland [CW, Nov. 13]. Rifkin has pleaded not guilty and is awaiting trial [CW, Dec. 18].

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Federal DP Acquisition Ills Headed for Cure?

Review & Forecast

By Brad Schultz
CW Staff

This year, charges of incompetence and outright corruption have surrounded the federal mechanism for acquiring computer systems. In the words of one congressional committee, a DP "policy vacuum" has been identified in the government.

But in the last weeks of 1978, top officials of the two agencies charged with directing DP acquisitions – the General Services Administration (GSA) and the Office of Management and Budget (OMB) – have announced what constitutes a massive drive to fill the vacuum.

The drive is aimed at narrowing the cycle time for procurements; obtaining a fuller appreciation of total systems lifetime costs, organizational impacts and privacy issues; and achieving a closer fit of benchmarks to user wants. In addition, the agencies hope to more closely align government expertise and resources with the state of the art largely established by industry and academia.

According to a congressional report, about 80% of the federal computer systems are at least six years old because bureaucratic "red tape" has imposed a typical procurement cycle time of three to four years for a major system. "The present [average] cycle indicates guaranteed obsolescence," the report charged [CW, Aug. 21].

GSA has responded by decentralizing procurement authority. This year, the agency relinquished control of any DP purchase of less than $300,000; the "threshold for blanket delegation" had been $100,000.

On Sept. 8, 1979 the threshold will be $1 million (see article on Page 53). Most single computer system purchases by federal agencies will thus be allowed to forego GSA clearance, shortening the time between start of the search for a contractor and eventual implementation of that contractor's system.

Leadership Role by OMB

The stinging rain of criticism that fell this year on many who manage federal DP departments – or the agencies those departments serve – has evidently prompted OMB to take a leadership role in federal DP acquisitions policy-making.

The general government team of the President's DP reorganization project – established by OMB last year to recommend ways of improving federal DP –effectively told President Carter to put "Management" back in the agency's name. The team concluded that "the absence of consistent management practices in the federal government is the major cause of the problems with information resources" [CW, June 26].

Though congressional investigators called OMB "ineffectual, producing no policy guidance whatsoever," the same investigators and the House of Representatives Appropriations Committee agreed that OMB should be made the solitary policy director on federal DP acquisitions [CW, Sept. 4].

In response, OMB has revised several of its circulars pertaining to acquisitions, and it plans, by next August, to consolidate into a single system the 851 "regulatory systems" that currently befuddle vendors. The present "thicket" of rules, regulations and guidelines discriminates against smaller would-be contractors by entailing a need for expensive sales consultants, an OMB official explained. (see story on Page 12).

Early in 1978, OMB revealed plans to form a central computerized system to monitor federal contracts. Such a system already helps the Department of Defense (DOD) keep track of its 70% share of federal purchasing; reportedly for this reason, DOD was chosen to devise and maintain the planned facility for as many as 80 civilian agencies [CW, March 20].

Pentagon Criticized

The reorganization project's national security team roasted the Pentagon for waste, inefficiency and unreliability which, the team said, is rampant in military DP sections as a result of insufficient accountability to a central review office and poor communication between the people buying systems and those using them.

A GAO report slammed Interior for underuse and duplication of computer resources that allegedly resulted in "lost opportunities" to save as much as $25 million during the past five years [CW, July 10].

Privacy concerns sparked a congressional look into the Federal Bureau of Investigation's (FBI) solicitation for a telecommunications system to permit the switching of criminal justice data between state and local law enforcement agencies.

GSA only authorized the FBI to request proposals for minicomputers to replace the bureau's two IBM 2703 communications controllers, a GSA spokesman maintained. The FBI was eventually directed by GSA to "return unopened" the vendor proposals it received for the "message-switch."

A GAO report on the Commerce Department's Federal Information Processing Standard (Fips) program found evidence of collusion between

(Continued on Page 8)

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Univac Extends High End of Its V77 Mini Line

(Continued from Page 1)

Univac attributed much of the V77-800's improved performance over the V77-600 to the larger system's enhanced cache memory. Integrated into the 800's CPU, the 1K-byte memory cycles in 150 nsec, more than twice as fast as the V77-600's cache, which cycles in 370 nsec, the source noted.

Megamap Standard

In addition to offering a faster memory, the V77-800 also provides Megamap, Univac's V77 memory management system, as a standard feature. With the V77-600, by contrast, Megamap was offered only as an option.

Under the memory management system, 16 independent maps divide physical memory into 1K-byte pages, which users can allocate to their programs as needed. Moreover, Megamap allows the V77-800 to address up to 2M bytes of main memory, compared with a 1M-byte maximum for the V77-600, the spokesman added.

The 600 and 800 systems also differ in the amount of writable control storage (WCS) they provide. With 12K bytes of optional WCS, the current high-end system incorporates three times more control storage than the previous high-end model, which provides only 4K bytes.

Capable of performing arithmetic and logic operations on 16-bit data and instructions, the V77-800 offers a 150 nsec machine cycle and a 600 nsec main memory cycle, the source reported. It also provides a minimum of 128K bytes of addressable storage expandable in 128K- or 256K-byte increments, which cost $5,000 and $9,000, respectively.

Software Support

Operating systems available with the V77-800 include Summit and Vortex II, which support program development languages like Cobol, Fortran IV, Ansi '77 Fortran, Pascal, RPG-II, macroassembler and microassembler. Other V77-800 software aids reportedly include Cincom Systems, Inc.'s Total data base management system and assorted communications packages that support IBM 3270, IBM Hasp remote job entry and Univac's DCA, Uniscope and Ten 04 protocols.

Among its standard hardware features, the minicomputer incorporates hardware multiply/divide, a real-time clock and power fail/restart logic plus a 6K-byte programmable read-only memory control store for sequencing processor operations. The mini also provides 600 nsec to 750 nsec error-correction memory that automatically corrects all single-bit errors and reports all double-bit errors, Univac said.

In addition to the expanded WCS, the V77-800's optional features include a 64-bit floating-point processor that performs both single- (32-bit) and double- (64-bit) precision addition, subtraction, multiplication and division.

Working with Ansi '77 Fortran, the floating-point processor is said to provide the computational speed and accuracy required by many scientific and engineering applications. It performs a typical single-precision addition, for example, in 1.65 microsec, the spokesman said.

Because all four members of the V77 line are compatible in software and peripherals, users of the models 200, 400 and 600 can upgrade their systems to the Model 800, although they must replace their CPUs to do so, he added.

In a maximum configuration, the V77-800 incorporates a 2M-byte main memory, 1.6G bytes of disk storage and 32 CRT terminals.

A configuration consisting of a 256K-byte CPU, eight asynchronous terminals, floating-point processor, 60M-byte disk unit, 300 line/min printer, 75 in./sec tape system and Summit operating software costs $135,000.

A system with a 512K-byte CPU, 16 asynchronous terminals, floating-point processor, 60M-byte disk unit, 300 line/min printer, magnetic tape unit, Summit operating system, Total data base management software, Cobol and Fortran costs $181,000.

First deliveries of the V77-800 will begin next July from Univac, which can be reached at Box 500, Blue Bell, Pa. 19422.

Itel System Backs IBM Programmers

(Continued from Page 1)

mitted queue so they can see if it is making progress or has hit a snag.

At the other end of the development process, the software enables the programmer to check out just the diagnostic messages from a compilation or assembly, with the possibility of finding enough information in that small printout to avoid the generation of a faulty program listing.

Itel pegged Prepso as something of a halfway measure compared with Maestro. The workstation in that system has to be dedicated to the development task, whereas Prepso was designed to use — indeed, share the use of — conventional terminals already in place for other DP chores.

Although Prepso can be used with its own internal communications line driver, an interface to IBM's Customer Information Control System (CICS) is also available, enabling installations to utilize the Itel software directly on terminal networks based on CICS for the organization's application work.

Response times under Prepso "have proven significantly better" than times registered under IBM's Time Sharing Option (TSO), the spokesman said. A beta test site, using Prepso and CICS, ran its transmissions over land lines and a satellite link at 4,800 bit/sec and experienced response times of 3 to 5 seconds despite the 170,000-mile round trip, according to Itel.

The functions of Prepso are invoked by English language-style commands that are grouped by the tasks they perform. These include job submission and retrieval, session management, data set manipulation, retrieval of status information and basic communication with the system.

Noting that Prepso can work, at least locally, with IBM 3277-2 CRT terminals or their equivalents, the spokesman said the user has full screen editing, scrolling and break facilities in addition to a tabbing function, full screen roll and input prompting.

Supplementing its capabilities in support of program development and testing in the environments best suited for each of those operations, Prepso can also be used to create and maintain documentation for the system it helps spawn or any others the site wants to support in this indirect way, the spokesman continued.

Prepso requires direct access storage devices (Dasd), but can work with any such units supported by the operating system under which it is functioning, he added.

The package is available on a perpetual license agreement for $24,000. First customer deliveries of the system are scheduled for January, Itel said from One Embarcadero Center, San Francisco, Calif. 94111.

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Cure Ahead for Federal DP?

(Continued from Page 6)

the National Bureau of Standards (NBS) and vendors that may have biased the awarding of Fips-development contracts to certain firms [CW, Jan. 3].

"Federal agencies have become locked into suppliers of computers and services either because certain essential [DP] standards have not been developed or agencies are not complying with existing standards," a draft of the report stated.

GAO concluded that more than $500 million has been lost annually because of the Fips program's inadequacies. For example, the lack of a hardware I/O interface standard was blamed for a loss exceeding $100 million in 1969 and "much more" last year by forcing the government to procure on a noncompetitive basis.

The GAO's harshest criticism went to the NBS' Institute for Computer Sciences and Technology, which, after 12 years of operation, had allegedly produced standards in only 15 of 65 areas originally slated for standarization. The report indicated that a more realistic estimate of this need is 120 areas.

An OMB official recently expressed rekindled faith in the Fips program and noted that OMB will hold federal agencies accountable for Fips compliance through regular review [CW, Dec. 18].

This year also featured the federal government's consideration of "architecture-specific" requests for proposal as a means of stimulating competition by extending bidding eligibility to vendors able to emulate specified mainframe prototypes through firmware.

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'Office of the Future' By 1990s

DDP: Step Toward Users' Economic Freedom

By Marcia Blumenthal
CW Staff

PALM BEACH, Fla. — Large DP centers are "turning out to be economic straitjackets" and distributed data processing (DDP) is just the first step in technological advances that will release those bonds, one analyst has predicted.

DDP will increase management's productivity and change the way business is structured, according to Harvey L. Poppel, senior vice-president of Booz, Allen & Hamilton, Inc..

Those advances will occur at a revolutionary pace that will make interactive workstations common by the mid-1980s and the "office of the future" a reality by the 1990s.

Poppel told executives attending the winter meeting of the Computer & Communications Industry Association (CCIA) here recently that managerial efficiency could be increased 10% to 25% using new applications of information technology.

The relaxed turn-of-the century atmosphere of the meeting site, the Breakers resort — with its vaulted ceilings painted with Victorian cherubs, its potted palms and with strains of violin music floating through corridors lined with long, wide wicker furniture — made Poppel's futuristic view seem even more dramatic.

Four Major Technologies

Information technology is one of the four major technologies, Poppel said, yet applications of that technology have lagged behind applications for the other three — materials production, life support and energy.

Major breakthroughs in those technologies have been occurring since the Industrial Revolution, whereas advances in information science have only been developed since World War II, Poppel maintained.

While other technologies have evolved past machine-age stages, Poppel compared the large DP center to machine-age mentality. Distributed processing represents the "first clear break with the machine age" for information technology, he added.

Until now, the benefits of information technology in the business world have been confined to tasks such as payroll, Poppel said. But the future will bring a revolution in which DP capabilities will be at management's fingertips for decision-making and for the development of decision-making models, Poppel maintained.

Corporate strategies such as competitive positioning and return on investment will be developed through interactive computer applications, with managerial productivity a major result, Poppel said.

Pointing to a study by Henry Mintzberg which distinguishes the characteristics of a manager's work, Poppel noted that 70% of a manager's time is spent in communications activities.

Mintzberg found that managers spend 35% to 40% of their time in meetings, 25% to 30% reviewing records and reports and corresponding, 5% to 15% on the telephone and 5% to 10% on travel.

"The trick is to increase a manager's efficiency in performing these communications activities, leaving more time for analysis," Poppel explained.

Managerial efficiency can result in a new organizational design in which fewer intermediate offices and flatter hierarchies may prevail. "Intermediate layers of management are generally for filtering communications down through the ranks," Poppel said.

By avoiding these layers, managers will require fewer employees, thus keeping inflationary labor costs in check. Mailing cost reductions and energy savings by avoiding excessive paper use and unnecessary travel are other benefits business will derive.

If communications technologies such as electronic mail and teleconferencing are accepted within a firm, organizational designs of companies will begin to change during the 1980s, Poppel predicted.

But there are obstacles. The gap between corporate planners demanding handy access to equipment and data and systems managers opposing with "sunken costs arguments" must be closed, Poppel said. Systems personnel are not yet business-oriented, a situation that will change, Poppel said, pointing to the efforts of one large company actively looking for MBA graduates to do corporate planning using informations systems.

Also to be contended with is the probable backlash resulting from the unionization of white collar workers, he said.

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Will Help Only If User Has Goal

Change in IBM Attitude on CPE Efforts Cited

By Don Leavitt
CW Staff

SAN FRANCISCO — IBM seems to have changed its attitude in the past six months about working with user installations on computer performance management projects, according to Thomas E. Bell.

A long-time computer performance evaluation (CPE) consultant now with the Singer Co., Bell told a tutorial session at the recent Computer Measurement Group (CMG) here that IBM personnel are demanding more user input.

If a user can't answer the question "What do you want?" in specific terms, IBM is now likely to point out that it can't really help, despite its various tools and technicians, he warned.

Bell made the comment to emphasize his contention that computer performance management can only be effective if its goals are expressed in user-accepted objectives with control limits, rather than in the traditional, "process-oriented" measures of traditional CPE.

Turnaround time or response time is much more difficult to define than a degree of CPU utilization, but that's what is needed for the user to know whether he is getting the service level he wants. If he thinks he isn't and asks IBM to help "improve his performance," the vendor is very likely to ask him what he specifically wants out of the system, Bell said.

Realistic Target

Whatever objective is selected as the performance criterion, the target value should be realistic, Bell continued. It obviously does no good to set it too low but, on the other hand, a target that is so generous that it can't be exceeded "isn't really any good either," he noted.

However, once a target turnaround time, for example, is set, it has to be a reasonable service level: 95% of all jobs to be turned around in three hours, for instance.

Recognizing that a certain amount of variety is part of any system, the user must then set bounds on what he will accept as being within normal expectations, Bell said. After that, only incidents that fall outside the control limits need be of any concern to the manager or his CPE personnel.

Setting both the target value and the control limits must involve the users who will be affected by the system's performance. And the involvement must be intelligent, Bell warned, noting that puts a real burden on the DP staff to educate the user on what he can reasonably expect or what he honestly needs in support.

It's not enought to simply ask the user what kind of turnaround time he wants unless the user understands how his answer might truly impact his own operations or the rest of the organization.

Observe the User

If performance management is being applied to current operations, Bell said, one of the best ways to determine what is satisfactory response time for a terminal user is to "just get in the user department and observe what happens."

The DPer should note when an operator appears frustrated by response time and, either with a stopwatch or by analyzing job-accounting records, find out the length of the unsatisfactory response time and what caused it.

For applications still in development, there is no such simple approach; it has to be the best estimate of what will be tolerable when the system is fully loaded. If a system is built with that target, however, it may react too quickly in the early stages of live use.

That, too, can be disconcerting and misleading for the future, when such fast responses won't be possible, Bell said. To avoid that problem, he suggested building in a time-delay loop to slow the lightly loaded system and then taking out the loop as the load, with its natural delays, increases.

Saltman Wins NBS Award

GAITHERSBURG, Md. — Roy G. Saltman, a computer specialist at the Commerce Department's National Bureau of Standards (NBS), received the Edward Uhler Condon Award at the Sixth Annual NBS Awards Ceremony held at bureau headquarters here recently.

The award, which includes $1,000 and an engraved plaque, recognizes distinguished achievement in scientific writing. It is named for the former NBS director who was internationally known for his contributions to scientific and technical literature.

Acclaimed for Excellence

Saltman won the award for a report entitled "Copyright in Computer-Readable Works: Policy Impacts of Technological Change," which has been "highly acclaimed for its technical excellence," according to an NBS spokesman.

Based on a discussion of economic, technical and legal factors, the report offers recommendations on copyrighting computer programs and data bases.

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PRODUCTS FOR PERFORMANCE

Government Seen Working to Better DP Policy

By Brad Schultz
CW Staff

WASHINGTON, D.C. — The Carter Administration is seeking to promote computing research and development, boost competition within the computer industry and better align federal government DP practices with the latest commercial technology.

That message from Lester M. Fettig, administrator of federal procurement policy with the Office of Management and Budget (OMB), was delivered at the 1978 Association for Computing Machinery (ACM) convention here recently. This was seen as further evidence that President Carter's proclaimed assault on federal waste and underproductivity will be spearheaded by his Administration's corps of DP managers and professionals.

Immediately following Fettig at the podium, another top OMB official said more funds and extended responsibilities await federal DPers in 1979 [CW, Dec. 18].

At another session of the conference, National Science Foundation director Daniel C. Atkinson declared that the Administration wants more federal funds committed to computing R&D [CW, Dec. 11].

To provide computing personnel with better tools, the Administration is simplifying and consolidating its DP procurement policy, Fettig said. For example, it is changing the policy's language. The OMB now prefers that the process by which a government agency obtains a computer system be called an "acquisition" rather than a "procurement."

According to Fettig, systems purchasing staffs have failed to appreciate certain notions captured by the first term but missed by the second — including system life cycle and implied costs, such as for software conversion.

New Year's Resolution

Fettig suggested that, from the policy standpoint, OMB's foremost New Year's resolution is to simplify and consolidate the hundreds of *acquisition* rules, regulations and guidelines that have — by their sheer number, complexity and occasional contradictions — discouraged many vendors from entering federal bidding.

"Small businesses shouldn't need a government sales consultant to guide them through the thicket," Fettig remarked, indicating that the need for these experts works to the advantage of better funded organizations.

So the thicket will be pruned. By next August, a single "regulatory system" will replace 851 such systems currently imposed, the administrator announced.

Not only will the government foster more competition for its contracts, but more contracts will be available in the DP area, Fettig said. OMB will encourage government agencies to hire private firms to develop systems, rather than attempt to develop these systems in-house, he added.

Although the government prodded business into advancing technology during the 1950s and early 1960s, the government trails the state of the art today in many areas of technology, and business is prodding government to erase this lag, Fettig observed.

The government does have an obsolescence problem brought about by outmoded design specifications in its requests for proposals and acquisition cycle times that sometimes exceed a generation of technology, he told the session.

Earlier this year, the U.S. House of Representatives Appropriations Committee noted that, according to a poll of "major computer vendors," about 80% of federal computer systems are at least six years old, with the remaining 20% more than three years old.

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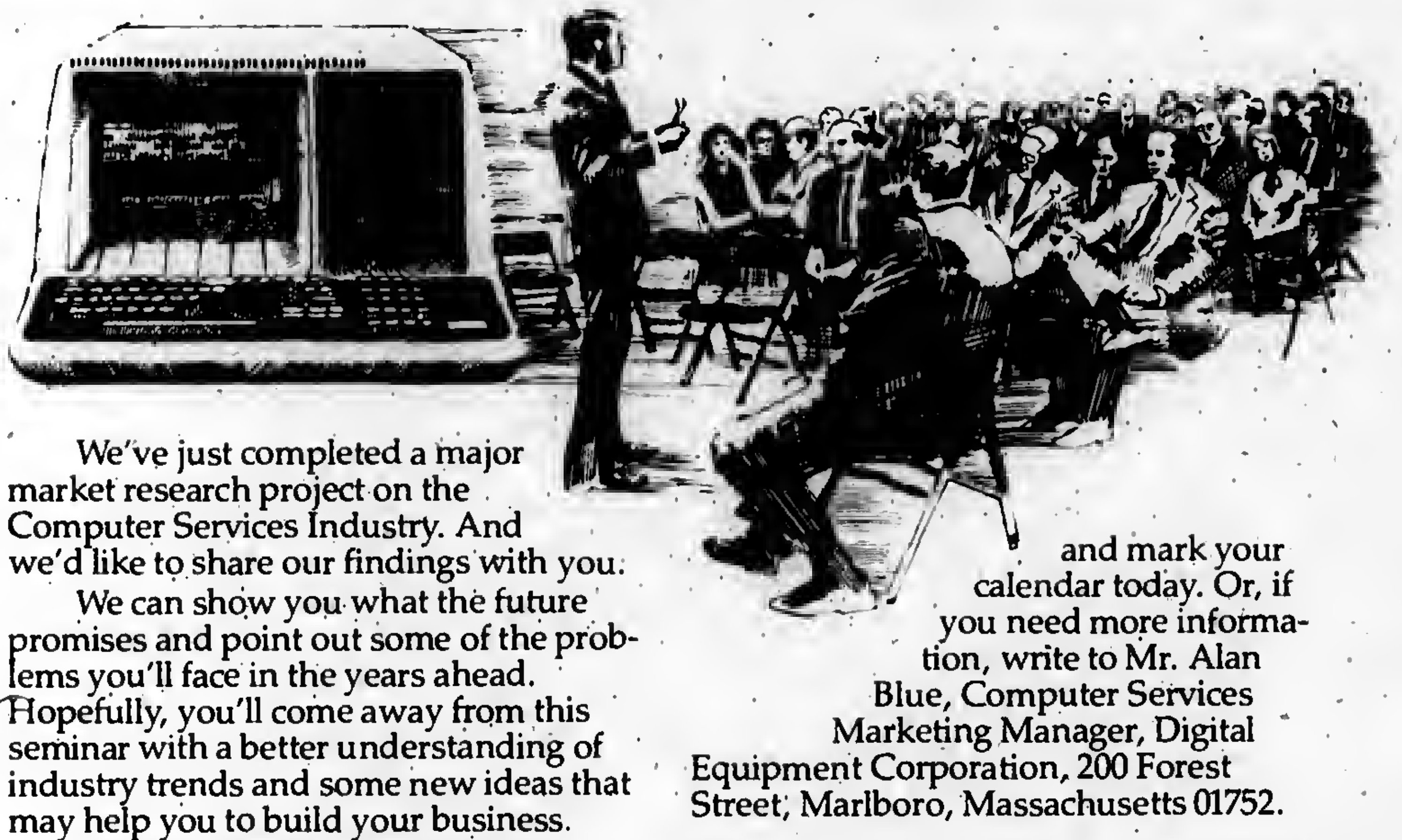
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At Center of Tape Controversy

IBM's 'Stretch' Subject of Courtroom Debate

By Connie Winkler
CW Staff

NEW YORK — The U.S. vs. IBM antitrust trial had its own tape controversy recently — not over a gap but over the technological success, or financial fiasco, of the Stretch computer in the early 1960s.

The Stretch was an early scientific machine that came between the IBM 701 and the 1401 and which became the IBM 7030.

The tape controversy developed unexpectedly last week when IBM counsel Paul C. Saunders wanted to introduce a tape recording of IBM Chairman Thomas J. Watson Jr.'s speech at the annual IBM technical awards dinner in 1966. The tape included Watson's statements about Stretch, Saunders said.

IBM witness Stephen W. Dunwell testified that at the dinner, Watson publicly apologized to him for cutting the price of the commercially available Stretch, the IBM 7030, from $13.5 million to $8 million. The cut came in 1961, not long after the first machines were delivered to the Atomic Energy Commission (AEC) and the National Security Agency (NSA).

Because of cost and delivery date overruns, Dunwell was much criticized for his business management of the Stretch project and was demoted to a position in the research lab. In 1966, however, he was named an IBM fellow, a distinguished research position within IBM.

Saunders played the Watson tape from the IBM archives and argued that it was an accurate and admissible statement of Watson's beliefs about Stretch and Dunwell. The government objected that Watson's remarks were made in a "gold watch" environment and therefore were untrustworthy.

After both sides spent most of a day listening to and arguing about the tape, Judge David N. Edelstein ruled it was hearsay and could not be admitted.

Dunwell was apparently called to testify to the technological superiority and scientific breakthroughs of IBM's early computers.

However, the government introduced many documents that suggested the Stretch's success was exaggerated. IBM lost $22 million between 1956 and 1961 on the first Stretch machines for the AEC and NSA, one internal memo said.

Another memo written by one of the Stretch team called the project a "financial fiasco."

The price cut came after the AEC complained it was getting too little performance for too high a price. And, although it was originally predicted that 37 Stretch machines would be sold, fewer than 10 actually were.

Dunwell's Stance

Dunwell contended throughout his three days on the stand that the Stretch project was a success. "Stretch was a very successful project [and this is] confirmed by the fact that the product line included components from Stretch," he said. "Customers used the machines for many years."

Dunwell, who worked for IBM from 1934-1975, called the Stretch computer a "pacesetter" which was heralded in the trade press for five years thereafter. (The government introduced memos, however, to show that much of that publicity was generated in the trade press by IBM itself.)

Stretch included major innovations in transistor technology, computer architecture and automatic error correction, Dunwell said. About the time the highly successful IBM 360 was announced, Dunwell wrote to Watson that 22 features developed in the Stretch machine were included in various 360 models.

The Stretch project set a goal for itself to exceed the computing power of any existing computer by 100 times. IBM memos contend that that goal was without basis and probably too ambitious.

"Our mission was to produce the world's best computer at that time," the retired IBM engineer said. Working with him on Stretch were foremost computer engineers including Gene Amdahl, considered the father of the 360 and now chairman of Amdahl Corp.

Dunwell also testified that he saw no difference between scientific computing and business DP and that he had not been prompted in that testimony. While IBM has contended that there is no difference between commercial and scientific computers, the government argues that the market can be so divided. Stretch is generally considered a scientific computer.

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Exchange of Programs With Soviets Debated

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — U.S. boycotts of scientific exchange programs with the USSR have been hotly contested in this country over the past few years, and those debates will continue if a recent discussion here was any indication.

"The way you get a message to the Soviet Union is by hitting it over the head," Dr. Herbert R.J. Grosch said at a session on "Social Responsibilities and Scientific Freedom" at the recent annual meeting of the Association for Computing Machinery (ACM). Grosch is a former president of ACM.

The discussion featured Valentin Turchin, a Russian computer scientist who was allowed to emigrate to the U.S. and is now associated with New York University. Turchin contended boycotts are the only way the U.S. can show it is serious about human rights. ACM activity on his behalf kept him from being arrested by the Soviet authorities for his "dissident" activities.

Opposing View

The Grosch and Turchin views were strongly opposed by Robert Parslow of the UK's Brunel University. "I don't think actually making a boycott is effective," Parslow said. "You can't force people to change their minds. You can't hold a gun against their heads and tell them to think differently.

"Quite often the object of the [boycott] exercise is to make the people who are doing it feel good," Parslow declared. In addition, there is the possibility the activity will be counterproductive and "the row" made in the West about Soviet repression will only result in Soviet dissidents receiving worse treatment, he said.

Not only is boycotting scientific exchange programs ineffective, but it runs counter to the provisions of the ACM constitution, which calls for free and open exchange of scientific information, Parslow maintained. If the object is to change the way the Soviet government acts, it is necessary to keep open the lines of communication between the two countries, he added.

Publicity Helps

Turchin, however, countered Parslow by saying it is "an absolutely established, general law" that publicity in the West of Soviet repression eases that repression. "All the Westerners can do for dissidents is try to restrict the extreme measures" taken against them, he noted.

Boycotts won't influence the way the Soviet leaders think, but will temper the "excessive" actions they would otherwise take against dissident scientists, Turchin said. Because of the general unwillingness of Western scientists to back their protests over human rights violations with concrete actions such as boycotts, the Soviet "hard-liners" have become "rather cynical" about the outcries, he pointed out.

Anything less than a boycott is taken "as just words" by the Soviets, Turchin argued. It is necessary to let them know that any repressive action will result in some response that will really hurt.

The USSR still has the most to lose if scientific exchange programs with the West are cut off, he added.

Soviet Turnabout

Addressing Parslow's argument that boycotts are counterproductive, Turchin cited the Jackson Amendment, a move headed by Sen. Henry Jackson (D-Wash.) to tie freer trade between the U.S. and the Soviet Union to more liberalized emigration policies on the part of the Soviet government. He pointed out that although it initially resulted in fewer emigrations, that trend has recently changed.

In the face of "hard" actions, such as boycotts, the Soviets feel two pressures — the pressure of the initial public outcry and the pressure to appear unaffected by that outcry, Turchin said. Eventually, the publicity of human rights violations will soften the Soviet stance, he maintained.

The first step on the road to "liberalizing and democratizing" the USSR, he indicated, is to restrict the "rampant repression" and excessive prison terms meted out to dissidents for trivial or trumped-up violations of Soviet law. Refusing to take "major steps" to help dissidents can only encourage such repression, he said.

A central question of the debate was whether the ACM should be involved in political concerns. Grosch, who described himself as "an activist," said the association should be ready to assist scientists in any country who are victims of repression.

ACM President Daniel D. McCracken said that while ACM members will continue to act as individuals, he does not think the majority of a technical association would want its organization to become deeply enmeshed in political controversies.

Humphrey Award Accents Meet

WASHINGTON, D.C. — A posthumous special award to Sen. Hubert H. Humphrey in recognition of the former U.S. Vice-President's "dynamic, forceful and continuing leadership" toward the solution of the nation's information problems highlighted the American Society for Information Science's (Asis) 1978 awards presentation at its annual meeting here recently.

Asis' outgoing president, Audrey N. Grosch, presented the award — an engraved plaque — to Frances Howard, sister of the senator who died last January. The award citation called Humphrey the "Champion of the Information Age."

The society's 1978 Award of Merit went to Calvin N. Mooers, president of Rockford Research, Inc. of Cambridge, Mass., in recognition of his early work on digital computer systems. Mooers made the first proposal to use the Boolean operators "or," "and" and "not" to prescribe selections in retrieval machines, Asis said, and described the future importance of what are now called computer networks.

Mooers was credited with coining the term "information retrieval" in 1950. Other accomplishments include securing several patents in information retrieval and signaling, producing a text-handling language, authoring some 200 publications and forming "one of the first companies whose only concern was information."

In other Asis news, the society announced that James M. Crestos has succeeded Grosch as president and will, in turn, be succeeded by Herbert B. Landau in October 1979. Crestos is executive director of the National Federation of Abstracting and Indexing Services in Philadelphia; Landau is assistant director for information systems at the Solar Energy Research Institute in Golden, Colo.

Asis' new address is 1010 16th St. N.W., Washington, D.C. 20036.

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COMPUTER EXPO CARAVAN '79

Miami System Spots Specials, Clues Shoppers to Best Bargains

By Ann Dooley
CW Staff

MIAMI — Shoppers here can reduce their food bills with a unique system that indicates the best buys for their money among the supermarket specials advertised each week. The automated system compares the prices of seven major supermarket chains, shows the price differences between brands and compares meal plans based on the weekly specials.

The program was developed by Mark Geigel, a nutrition expert who spent one and a half years testing and developing the system to pick the best buys from among the 85,720 grocery items.

Sponsored by several community consumer groups and conducted by the Consumer Computer Project, printouts indicating weekly price information are mailed to more than 33,000 shoppers, and countless others pick up the information at mobile units located near the major stores.

Weekly pricing data on nearly 83% of all items found in most grocery stores is listed in the system. The suggested price and descriptive information for each product are taken from raw data provided by major food manufacturers and stored on a General Automation, Inc. Model 220-based system. The basic suggested price and weekly prices are then compared.

Each week, as the seven supermarket chains advertise their weekly specials in local newspapers, project workers input the information into the GA system via Hazeltine Corp. Model 1500 terminals. The system is programmed to break down the price of each product into cost per unit and weight or volume.

The system also compares the product's price against what it sold for a week ago and a year ago and determines whether the price is above or below the average, based on the year-to-date prices.

Additionally, the system compares prices of different brands being sold within one chain by price and weight and compares one store's prices with those of other supermarkets. This run was programmed into the system even though most shoppers buy all their grocery items in one store, Geigel said.

Menu Planning

Geigel programmed the system to break down each product according to its nutritional components. The system takes the nutritional data and compares it against a standard set of 500 stored menu plans from the U.S. Department of Agriculture.

Using both sets of information, the system produces 30 menus a week, each one including meat bread, starch, beverage, dessert and a fruit.

The system is geared to select menus with ingredients corresponding to the lowest priced items of that week. In a secondary run, the system can create menus based completely on the items listed in that week's advertised specials.

The system is also programmed to determine the cost of three menu plans according to the prices of each supermarket chain so shoppers can clearly see each menu's cost.

An additional run includes all the items being offered by all the major stores. If a shopper were determined enough to pour through all the data on the printout of every item in every store, he could realize considerable savings, Geigel said.

The printout is mailed weekly to any person who requests the service. Because of funding restrictions, however, only one copy can be mailed to each shopper. The system is programmed to hit on any duplicate names and addresses.

In order to receive the printout, a shopper must indicate the size of the family, the market at which she shops and how much is spent weekly on groceries.

Also because of funding restrictions, prices for only one grocery store can be mailed to the shopper. If more extensive data is wanted, the shopper can go to any library or any of the 16 branch offices of the Community Action Agency, a Dade County social service agency, where complete copies of all the information is kept on file.

This is the first time that weekly computer printouts are part of a library's circulation material, according to Mike Schulman, executive director for the Consumer Computer Project.

Unadvertised Specials

Shoppers can also learn about unadvertised bargains by walking up to one of three roving systems which travel to different stores in the area. The remote units consist of an Apple Computer, Inc. Apple microcomputer linked to the GA CPU by phone lines, a Centronix Data Computer Corp. line printer and a Porsche automobile.

Project workers provide the information about unadvertised specials by going into the supermarkets and looking for them, then going back and entering them into the system, which is housed in the auto. The data is keyed into the Apple, which functions as a data collector, and then transmitted to the GA system, which sorts the data and feeds it back to the Apple.

Consumers can see unadvertised specials on the CRT screen or take one of the previously duplicated copies of that particular store's advertised specials. Project workers encourage shoppers to add their names to the mailing list so the prices can be mailed regularly to their homes.

(Continued on Page 16)

Thieves Make Off With 'Best Buy' Programs

MIAMI — Thieves broke into the headquarters of the Consumer Computer Project recently, stealing programs necessary to the operation of the successful grocery "best-buy" project.

Miami police called in to investigate the crime said the theft was committed by professionals who "knew exactly what they were doing."

In the process of installing additional security devices to protect the equipment and remaining software, electronic bugging equipment was discovered in the computer area. An investigator for the Federal Bureau of Investigation was called in and has since supervised the investigation.

Taken from the secured headquarters building were several 20M-byte control disks containing programs for trend analysis of the weekly and week-to-date prices for the grocery products. Both the original disk programs and the backup disks were taken.

Printouts Missing, Too

Also missing is a printout listing the prices of products and the Consumer Basic manual which, according to project spokesman Alan Johnson, was "more disturbing than the rest since someone can use the manual to interpret the program." The loss was estimated at $100,000.

The program is of no use to anyone else; if someone tried copying the program, he could be stopped on legal grounds, so it seems as though someone definitely wants to stop the project, Johnson said.

In the meantime, 50 volunteers are being brought in to keypunch the material to re-create the missing programs. Project workers hope to have the missing data back on-line in two to three weeks.

Additional CPU and peripheral equipment from General Automation is being donated to the project in order to keep up with the steadily growing demand for the pricing information. The recent burglary has also aroused more interest in the project.

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How Much Do You Know About EFT Status?

WASHINGTON, D.C. — The following "true or false" quiz, composed by George C. White, a Chase Manhattan Bank vice-president, was passed to those attending the session addressed to electronic funds transfer (EFT) at the Association for Computing Machinery's annual meeting, held here recently.

How do you measure up? Answers are given on Page 17 of this issue.

True or False

1. Checks continue to account for the largest dollar amount of funds transfers, even with the widespread publicity about EFT.

2. An electronic alternative must be found for the continuing increase in check volume, now estimated at over 30 billion annually.

3. EFT is advancing now with the issuance in October 1977 of the National Commission on EFT's final report, as well as the passage of the Financial Institutions Regulatory Act [CW, Oct. 23].

4. EFT would advance more rapidly if each consumer could be assigned a single identification number, such as a Social Security number for individuals or a Dun's number for corporations.

5. Consumers have to be educated to give up control (and float) in the initiation of their payments in an EFT environment.

6. Consumer advocates are helping to educate consumers about EFT transactions.

7. Older persons — retired individuals, for example — appear to be reluctant to use EFT capabilities.

8. Financial institutions are now issuing both Master Charge and Visa cards because of customer pressure.

9. Bill payments by telephone represent a new aspect of EFT.

10. EFT services are too new to have yet effected shifts in market share.

11. Automated clearinghouses (ACH) exclude point-of-sale — for example, cash-dispensing — transactions.

12. ACHs offer faster funds settlement than the present check environment.

13. ACHs are restricted to low-value transactions.

14. Money transfer networks — such as Fedwire, Chips, Bankwire and Swift — are expected to convert to common message formats in the 1980s.

15. One of the primary advantages of Swift is funds settlement in foreign currencies.

System Rates Food Bargains

(Continued from Page 15)

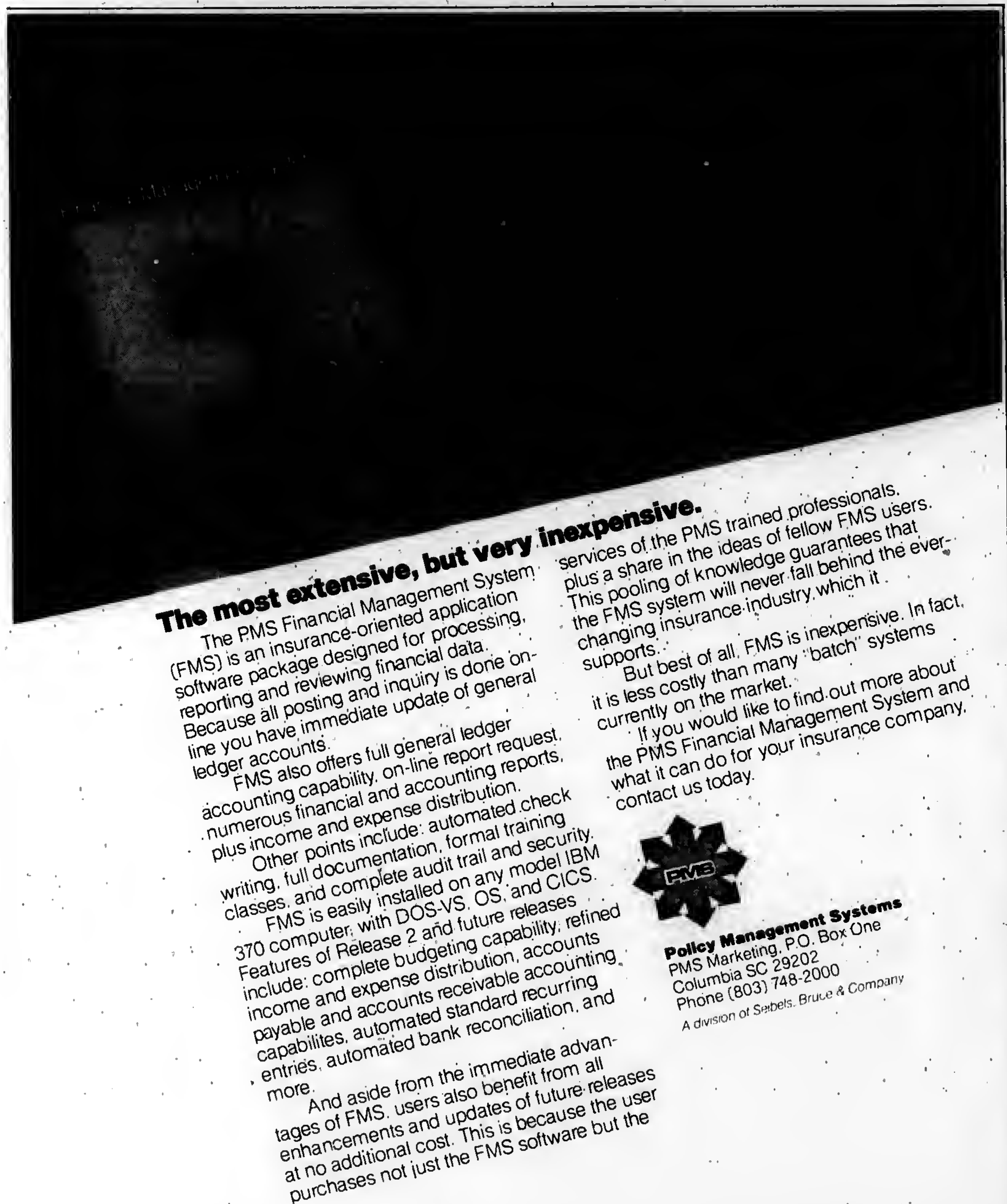
The complete system includes the GA 220 system with 64K bytes of memory, eight transmission lines of RS-232-compatible controllers, 10M bytes of disk, several Hazeltine 1500 terminals, a specially designed Basic operating system and an Isam filing system with formatted output routines.

Also included are a Terminet, Inc. Series 300 line printer and several Centronix printers, which are located in the mobile units along with the 48K-byte Apple microcomputer and high-speed serial interfaces. The total system also includes two disk drives and two minifloppies and the three donated autos, Geigel said.

GA equipment was selected over Digital Equipment Corp. and Hewlett-Packard Co. products because it suited the project's needs most closely, according to Geigel. The Apple system was chosen because it could operate well in a mobile situation, he noted.

Although the program has only been in full operation for several weeks, there have been no breakdowns or problems, he said. Fail-safe codes were put into the system so that if any errors occurred during data input, the system would flag them.

So far the response to the project has been very positive, according to Schulman. Surprisingly few shoppers have complained they experienced any problems in reading the printout, he said.



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Based on U.S. Mini

Soviet Group Using 'Dialogue Payroll System'

By Marcy Rosenberg
CW Staff

BOSTON — A minicomputer-based interactive payroll system sounds like just another small business system application. This one, however, was developed by an engineering research institute in the USSR, a country oriented more to scientific than commercial applications.

Scientists from the Academy of Sciences Institute of Radioengineering and Electronics in Moscow described what they called a "dialogue payroll system" in a presentation at the Wang Laboratories, Inc. Sixth User Society Symposium here this month.

After a two-year development effort, researchers at the institute put together an applications package that runs on Wang hardware and Basic 2 software to automate payroll procedures in its bookeeping department.

The resulting interactive program allows operators to enter, retrieve and update resident data, as well as enter current available data, calculate all payments and taxes and print necessary documents, according to Dr. Valery V. Romanovtsev, senior researcher at the institute. Output includes a list of employees and when and how much was paid to each.

Dubbing this program development "an unusual approach for our country," Romanovtsev cited two unique requirements for its application at his organization.

First, because of a shortage of programmers, the institute required that data entry be performed by an untrained bookkeeping staff that previously used paper and small adding machines to calculate and document employee payroll. The developers met this need by putting data entry under full program control and using a "self-explainable" question/answer menu.

The institute also designed its payroll system to comply with the Soviet tax system mandate that records of payments and taxes for each employee be kept for 13 months. This information can be stored in 1K byte of disk memory per worker, Romanovtsev said.

The payroll program operates on a 32K-byte Wang 2200-VP processor, 2226B CRT terminal and 2221W printer. The institute selected Wang mainly for its Basic 2 system software.

"We wanted Basic because we are not specialists in commercial applications — our emphasis has been in scientific areas," Romanovtsev noted. Basic 2 provided "a powerful sorting statement set and a flexible file system and bit/byte manipulation.

His organization looked at other systems, including "several of Soviet origin," and at Basic systems like the Digital Equipment Corp. PDP-11 family and Hewlett-Packard Co.'s 9830 and 1000, but none provided the same combination of features as Basic 2, he said.

Don't Need Speed

While DEC and HP systems may be faster than Wang because they use a Basic compiler — as opposed to Wang's interpreter — "we didn't need the speed," Romanovtsev said. The payroll application "didn't call for much processing," but instead required "file handling and flexibility to update the program and revise it from time to time. This is easier to do with an interpreter."

The institute found its system can accommodate up to 1,000 employees, but would only require additional data entry terminals — and no program or file changes — to handle more workers.

All in all, the dialogue payroll system proved "very effective" because it simplified data preparation and reduced stress and error probability, Romanovtsev maintained.

Several other USSR government institutes, in fact, may adapt the system to their own needs, he noted. These include the Information Institute for the Coal Industry, Academy of Sciences Physical Institute and the Economical Mathematical Institute.

It is not uncommon for Soviet organizations to "freely exchange technology and lend expertise to each other," he added.

In the future, Romanovtsev hopes to get additional funding from his institute for the research team to develop other small business applications software. Plans include such areas as money transfer, inventory control and financial planning.

Quiz Answers

You may disagree, but White maintained that all of the correct answers are "false."

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Editorial

Just Wait 'Til Next Year

'Twas the year before Christmas and all through the land
The tape drives were whirring with computer thefts grand.
Though the codes and the passwords were prepared with great care,
The embezzlers and felons popped up everywhere.

While bankers and executives were snug in their beds
And visions of profits danced in their heads,
Computers and terminals and DP machines
Were covertly used for criminal means.

Commercial Trust in New Jersey received such a clatter
When a keypunch mistake made a bank account fatter.
One-tenth of a million was lost in a flash
And a simple coin dealer had that much more cash.

In Flushing, a student who knew some DP
Awarded himself a Phi Beta key.
His grades were altered so lively and quick
That his peers were amazed and the faculty sick.

Two agents in Bridgeport for the U.S. DEA
Discovered that selling drug data would pay.
An IBM mainframe was used for the crime,
And they managed to profit for quite a long time.

In Toronto, an Amdahl was used for abuse
As students put CRT screens to misuse.
And Hawthorne, California, saw funds fade away
When a Honeywell system took part in foul play.

Even NASA had its share of computer-crime men,
Stolen DP directories and breached PDP-10s.
And who can forget the Belmont affair;
When programmer and cash were suddenly not there:

In L.A., the UCB staff had a fright
When $1 million was lost overnight.
And Security Pacific had its day to rue,
When a clever programmer took 10 million-two.

Now congressmen, now senators and banks in the nation,
All struggle to enact preventive legislation.
And Abraham Ribicoff is getting his licks,
While sponsoring Senate Bill 1766.

Today, for computers with data encryption,
Total security is nothing but fiction.
And computer criminals and crooks continue to sneer,
"If we didn't get you this time, just wait 'til next year!"

— — — Tim Scannell

Data Past

Five Years Ago
Dec. 26, 1973 — Jan. 2, 1974

WHITE PLAINS, N.Y. — IBM upgraded its 3740 data entry system to include expanded arithmetic and data editing functions; stored program control for searching, updating, formatting, keyboard operations and printing; a 3717 "steel belt," engraved-font, 155 line/min printer; expanded communications including multipoint data link control; and OS/VS1 370 support for diskette input/output.

— — —

NEW YORK — The U.S. Court of Appeals here dismissed IBM's appeal of a contempt of court ruling issued in its case with the government. At issue were documents that IBM turned over to Control Data Corp. before that company settled with IBM and which IBM later claimed were turned over "inadvertently" and should have been subject to a claim of attorney-client privilege.

Eight Years Ago
Dec. 30, 1970 — Jan. 6, 1971

NASHVILLE, Tenn. — Internal Revenue Service computer tapes containing thousands of tax returns which were erased by airport radar in the spring had not been restored as of this date. A consultant revealed that inadequate grounding of metal shielding was the cause of the wipeout.

— — —

TORONTO — Canadian government officials here began work on a debtor's data bank that would provide information to anyone for $2 per search. A spokesman for the Ontario government said the data bank would be restricted to sales contracts of $300 or more, chattel mortgages and the assignment of book debts by companies.

Letters to the Editor

If in Doubt, 'Power Off'

Computerworld readers, in their extensive experiences, probably think they have heard everything, but here is something I would like to share.

I work for a medium-sized hospital in southern Connecticut. The hospital has at least one computer operator on duty from 7 a.m. until midnight and leaves the computer running but unattended for the remaining seven hours. The machine is left running because Medical Records, Admitting and the Emergency Room do on-line inquirios and updates for any admissions that may come in during the night.

Well, the other night a security guard, making his rounds at about 3 a.m., entered the computer room and noticed the computer was on. He could not understand why the machine would be on when no one was there to run it, so he notified the night nursing service supervisor, whose duty it is to handle any emergency situation that may arise. A few minutes later she entered the computer room and, after assessing the problem, called upon her vast knowledge of DP and determined that the correct course of action was to press the "power off" button on the CPU.

The power down was not discovered until 7 a.m., when the first shift operator started work.

Hank Petroskey
West Haven, Conn.

Unsupported Data Supplied

P.G. Elam recently commented on the "future DP situation" [CW, Nov. 27].

I have recently questioned a number of often-quoted statistics (see "The 'Ten Great Software Myths" [CW, Mar. 6, 13]) and for that reason alone must quarrel with some of the information in Elam's commentary. References were made to unidentified experts and unsupported data was presented.

I question the following:

1. *Many* organizations are now citing costs as high as $71 for a line of code that cost $6 to $7 only 10 years ago.

2. DP costs, limited to 1% to 3% of the overall corporate budget 10 years ago, have now risen to between 12% and 15% in *many* organizations.

3. One industry expert determined that up to 70% of the *average* DP budget is directed toward people costs in some organizations.

4. People costs as a percent of overall DP budget may go as high as 90% in 1985.

5. DP is the world's most labor-intensive industry, with the possible exception of agriculture.

All budget surveys reviewed by this observer have shown personnel expenses as a percent of total DP expenditure to be a surprisingly stable factor. While DP (in the area of programming, not hardware building) is indeed heavily labor-intensive, it is certainly not to be compared with agriculture. The latter industry is very production-oriented — and highly mechanized.

Finally, Elam concluded that DP professionals — unlike other professionals — have had salaries triple or quadruple during the last 20 years. As this rate of increase equates to a nominal 5% to 7% annual compound growth, the apparent indictment of "computing technologists" as undeserving is not justified in view of inflation.

I do agree, however, with Elam's conclusions concerning the potential economic impact of acquiring externally developed software. I am convinced that off-the-shelf software products are the most viable alternative available to DP installations in searching for productivity increases with respect to application development.

Werner L. Frank
Woodland Hills, Calif.

Commentary

Pfeiffer's Uniqueness at IBM Disturbing

By Connie Winkler
CW Staff

Jane Cahill Pfeiffer, IBM's most recent woman vice-president and one of only two in the history of the company, lauded IBM in court this month for its efforts to bring women and minorities into the pool of potential vice-presidents [CW, Dec. 18]. That pool apparently remains dry because there have been no women or minority vice-presidents out of hundreds in the corporation since Pfeiffer left in 1976.

During here court appearance in the U.S. vs. IBM antitrust trial, Pfeiffer guessed that in 1976, 11,000 out of 130,000 technical, programming and engineering IBM employees were women.

— — —

Q: Would you point to IBM's track record in the number of corporate vice-presidents who have been women as an example of IBM's dignity for the individual rights of women?

A: Yes. I think the fact that there have been one or two women along the line indicates an openness that is ahead of most in our country.

Q: One or two out of 125?

A: Yes. Many companies don't have any and have none coming up.

— — —

IBM prides itself on being better than the best and this applies to the numbers of women and minorities it recruits and employs. Further, that commitment to excellence means those women and blacks are the best individuals that can be found for the job. If anyone has the qualifications to succeed, it is these minority employees.

Yet, the disquieting fact remains that only Pfeiffer has made it to the top.

— — —

Q: But yet, as of 1978 there are no women corporate vice-presidents at IBM. Is that correct?

A: That is correct to the best of my knowledge.

Q: In addition to Ruth Leach and yourself, do you believe there were no other women in the entire IBM corporation that were as equally qualified as any of the men chosen to fill the positions of corporate vice-presidents?

A: I don't pretend to know all of the women in the IBM corporation, but of all the women I knew, I don't feel that someone should have been selected while I was there for vice-presidency, in comparison to the men who were in those jobs.

Q: So that you felt that all selections made for vice-president of the IBM corporation were on the basis of merit?

A: Yes, I did feel that and I feel that now.

Q: And the result of that selection on the merits was a zero representation of women as vice-presidents today, is that correct?

A: I would have to say that it wasn't selection of the merits, that it was the development of people and that there were no women officers. And there were no minority officers, and that is because the development process did not early enough include minorities and women, with myself perhaps as an exception.

— — —

If women and blacks are not making it to the top at IBM, then that bodes poorly for the status of minorities at other computer manufacturers and DP firms.

In fact, the situation is not unlike that of computer users as reflected in a recent nationwide survey by the National Science Foundation (NSF) Women in Science program. The survey showed the number of men employed at or above the systems analyst level far outpaced the number of women [CW, Nov. 22].

As a positive step, NSF has started a grant program to colleges for science career workshops for women on a wide spectrum of scientific disciplines including computer science and engineering. This is a program IBM has supported.

However, if Pfeiffer's experience is any indication of the status of women, then grander programs are needed to bring women and minorities through the ranks of the computer industry. The first step must be taken by the companies themselves to wipe out the discrimination that prevented such development programs in the past.

The Taylor Report

Firms Give Ingredients For Useful Public Aid

By Alan Taylor
Special to CW

Pillsbury Co., a food manufacturer, and Honeywell, Inc. are collaborating to provide the public with a useful service. Pillsbury developed the program; Honeywell supplied the data network.

Food editors for newspapers input recipes into Honeywell's network to be analyzed into nutritional components by the Pillsbury program. The results of the nutritional breakdown are made available to newspapers so readers can get recipes tailored to their nutritional needs.

The Los Angeles Times and *The Minneapolis Star* are only two of the newspapers that run the nutritional breakdowns alongside recipes in their food columns. Peggy Katalinich, food editor at *The Minneapolis Star*, talked about her efforts to get foods analyzed into nutritional components at the National Food Editors Conference held this past October.

She first brought the idea to the University of Minnesota's food and nutritional department. It had a computer program that could fulfill the task, she said, but the cost would have been $50 per recipe.

Deciding that the price tag was too high, she went to Pillsbury and told the firm how useful it would be for the public to see this nutritional information in the newspapers. She recalled that Pillsbury liked her idea and started to adapt its confidential food analysis programs to meet newspapers' specifications.

Katalinich told the conference that someone realized no provisions had been made to get the food analysis results to the newspapers. The idea of sending everything to the computer room at Pillsbury's Minneapolis headquarters wasn't too attractive.

Frantic Activity

Only a week before the food editors' conference, Pillsbury called in Honeywell's data network. It was reportedly a frantic period.

The Pillsbury programs were transferred to the network, and some file structure problems were hurriedly patched. Differences between a time-sharing service program and a scientific research program had to be ironed out.

Then everyone was ready for the food editors' presentation. And the cost per recipe had been lowered from $50 to $3.50.

Further developments are taking place. File structures are not the only difference between scientific and commercial programs. Input differs, So does the library of nutritional values and running time efficiency. I hear that all these areas are getting attention.

For example, the measures that are input are being changed from grams to more familiar measures like teaspoons. The library is be-

(Continued on Page 24)

The Human Connection

Job Agencies Breeding New Professionalism

By Jack Stone
Special to CW

Can you imagine a person with the title "vice-president, director of training" in a personnel placement firm? Could such an individual be for real?

I heard of one recently. George Whitwell is employed by Fox Morris Personnel Consultants and is responsible for the training of about 150 employees who are located in offices in 12 major U.S. cities. To allay my doubts about the legitimacy of the title, I interviewed George at his office in Wilmington, Del., and found him dedicated to his task and a fine spokesman for his industry as well.

My initial bias against personnel agencies was derived from a positively wretched experience I had with an executive recruitment agency more than two decades ago. It handled me with all the delicacy of a pickax. Seems as though it circulated hundreds of copies of my resume without my prior knowledge and approval!

Some years later, I checked into another agency that offered me the prospects of money, power, fame and fortune, if I would only fork over three grand (one-time charge). In return, it offered to paper over the seamy edges of my cantankerous personality and make me reasonably presentable to the marketplace, at least long enough to land a better job. But no, it wouldn't guarantee placement or refund the dough if I didn't hit paydirt, so I took off to see a science fiction flick instead of signing up.

My conversation with Whitwell began on a sublime note:

Q: George, what's a nice young man like you doing all mixed up with a bunch of "headhunters?"

A: Jack, as you know, in any industry, there are a few companies whose operating policies and marketing practices give the business a bad name. But the so-called "headhunters" or "body shops" are dying out.

These terms are used to describe those placements firms who are known to honor the fee first and doing a professional job for applicant and company second, if at all. Such firms have no particular desire to build proper relationships with either party and really don't care whether the employment works out as long as the money rolls in.

Q: I hadn't heard of any training activity taking place in a placement agency. Isn't this function new?

A: As far as I know, we're rather unique. We have come to the conclusion that we must have an ongoing program of staff development to give our people both the knowledge and confidence to deal with highly qualified applicants and top people at client companies. For example, we recently engaged an internationally known consultant to conduct a seminar for our DP personnel recruiters on the changing

(Continued on Page 21)

Cost-Effective DP Training a Big Challenge

J. Daniel Couger
On
Education

According to the only survey we have been able to locate — it came from Brandon Systems Institute, Inc. — training budgets are up 25% from last year. And since DP budgets have increased by more than 15% (*Datamation*, January 1978), the training director has a significant increase in dollars at his disposal.

What is the component of training that costs the most? Is it entry-level training, intermediate or advanced? Or is it training on technical subjects or training in other areas, such as the behavioral aspects of system implementation, personal communication or supervision? What percent of the training budget is spent for systems personnel as opposed to operations personnel?

Unfortunately, there are few answers available on these important questions. The annual salary/budget surveys by *Datamation* and *Infosystems* do not include such information.

In fact, the survey information available is highly suspect. For example, the June 1978 issue of *Infosystems* provided data on the percent of total operating budget which the DP budget comprises. For the banking/financial area, the figure reported was 2%. In July, *Bank Systems and Equipment* reported the results of an American Banking Association (ABA) survey. According to ABA, the DP budget accounts for 9.2% of total operating expense for banks with more than $500 million in deposits and 8.5% for banks in the $100 million to $500 million deposit range. Whom does one believe?

Brandon Survey Results

In the DP training area, the only survey we have been able to identify is the annual one conducted by Brandon Systems Institute, Inc. Gary Slaughter, president, was kind enough to give us the survey results. Some 98 organizations responded to the 1977-78 survey, compared with 70 the previous year. DP budgets ranged from $1,400 (!) to $35 million. The average was $1,843,000.

The training budget averages 1.5% of total DP budget, compared with 1.2% the prior year. An interesting statistic is the average budget per person — $518 this year compared with $340 last year.

How do the survey organizations allocate their training dollars? The highest percentage goes to the application programming group, as Table 1 shows. However, the per-person share is highest for DP management and the system software group.

Twenty-eight percent of the survey organizations do not train users. For the 72% that do, introductory DP courses occupy the lion's share of user training. Other subjects include project management; system analysis and how to use application systems.

However, the cost of training users is not included in DP training budgets. The users are paying for their training; DP departments are "using the proceeds to finance more DP department training," according to the Brandon report.

Job Category	Dollars Per Person	Percent of Training Budget
DP Management	889	18
System Analysts	472	16
Application Programmers	683	33
System Programmers	890	13
Operations Personnel	267	20

Table 1. Spending by Employee Category

Anticipated Growth

Some 60% of respondents believed that the training budget would grow again next year. Some 34% felt it would be status quo and 6% anticipated a cut.

The highest cost component in training is the time of the individu-

(Continued on Page 24)

158
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James F. Miller
Assistant to the President
PEUGEOT
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Donald K. Lane
President, Small Business System Division
Software International Corporation

New Job Title Might Help

Systems Auditor's Job Often Misunderstood

By Michael Bingle
Special to CW

Systems audit is a title that misrepresents the function of the people assigned to it. The word "systems" should remain in the title, but should the term "Audit?"

Should there be another descriptive term added to form an even more ambiguous title?

Functionally, the auditor is responsible for examination and verification of financial accounts, but this is just a small part of the job of the system auditor. He is also a programmer, systems analyst and computer technician and knows quite a bit about computer operations and security.

So, should we call him a "systems audit analyst technical operations specialist?"

More realistically, my question is this: If we perform all of the jobs I have just mentioned, then why are we called auditors? Psychologically, "auditor" is about the worst thing we could be called, since we interact primarily with DP professionals who seem to feel the term "auditor" is synonymous with some sort of deadly plague.

Actually, we are just an extension of the overall DP function — the final step, so to speak.

If one were to talk with 10 different systems audit managers, I think he would be amazed at the diversity of opinions over exactly what the systems auditor's functions should be.

Reader Commentary

It is true that many managers feel the systems auditor functions as an accountant, but then why do most companies have accounting and internal audit departments? Why not just combine all of us and save both time and redundancy in the overall workload?

I don't think that combining the departments is the answer, but I do feel that something should be done to help clarify our objectives to the average computer professional. If changing the title will help, then let's do it! Perhaps then we will be accepted as the highly specialized DP professionals that we are.

Bingle is a senior systems technician in Systems Audit with Blue Cross/Blue Shield in Newark, N.J.

Agencies Take New Approach

(Continued from Page 19)

responsibilities in management information systems (MIS).

We have 12 offices in the eastern U.S. For sessions like the one on MIS, we bring specialists from those offices to a central location — generally our main office in Philadelphia — so they can learn more about their particular area of interest.

But we've also just about completed development of a six-month training program for our new personnel. This includes classroom or "live" experience to teach them the ways we work, the impact of any pertinent government regulations and the needs — and jargon — of some of the industries we support.

Q: What does your firm do (in addition to training its staff) that qualifies it as a professional services organization?

A: We have strong beliefs in the concept of commitment. We believe that we must demonstrate clearly to all the parties involved — the client company, the applicant and the recruiter — that we are in the placement business for the long term.

Several stringent policies we have established for ourselves include, first of all, having full-time, salaried employees in branch offices owned by the firm. We don't believe in the franchising concept of personnel placement agencies because we want to maintain control over our services.

The policy further requires that we employ high-quality professionals to handle our placements and not pay them solely on straight commissions.

Another policy requires that all fees be paid by the client company and only after the placement action is consummated. Furthermore, in certain cases, if there is a premature termination of employment, we stand to lose a portion of the fee. This policy forces us to focus on effective placement and not on early fees.

To meet our business objectives, we have to perform well and produce over and over again for the client company, so that we establish enduring relationships and repeat business. We quickly learned that the way to succeed is by working hard to find the right person for the position.

Happy New Year!

Peugeot in sixty days."

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Bernard F. Steiner
Treasurer
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Letters to the Editor

Lack of Women A Loss to Whom?

Having read "Lack of Women DPers Seen as 'Severe Loss' "[CW, Nov. 20], I ask, "To whom?"

The loss I see is to Women's Lib and to the business world in general.

Women's Lib suffers because it has found another area that it has not yet managed to force its way into by means of law or incrimination. The business world suffers because the energy spent dwelling on this subject could be devoted more constructively in so many other ways.

What I fail to see is the National Science Foundation and the science and engineering industry grinding to a halt because of a lack of women turning the wheels.

In some 19 to 20 years of working in DP, I have not required the assistance or encouragement of law, or a school or of Women's Lib to gain the education, opportunity or experience I have. I've advanced from input clerk to my present position as fianancial projects manager through interest and the desire to advance in my career in DP.

Young people today are given some insight into the area of DP at a very early age. If a young woman has the desire to seek further education and a possible career in this area, she has every opportunity to do so without the encouragement of someone who has decided that the balance between sexes is off by some wild percentage.

I strongly feel that women should be given every opportunity for education, career advancement and equal compensation, but only when they exercise the personal freedom to do so — not when someone decides they should pursue a career simply because the numbers are unequal.

I would almost bet that the number of DP-related degrees awarded is very much in line with the number of entrants to that course of study. Let's face it; nobody is forcing the women out of those degrees, it's just that there is a much higher percentage of women than men who prefer to work towards staying home eventually to raise a family.

You could major in accounting today and wait 10 years to apply what you have learned, but that would be tough to do with a concentrated effort towards an M.S. in computer sciences!

Sandi Doss
Indianapolis, Ind.

Blinded to Other Causes

To quote the Nov. 27 editorial, "Men outnumber women by more than four to one in upper echelon DP jobs . . . and the percentage of women receiving degrees in the computer sciences is even lower."

Does this imply that a higher percentage of women receiving DP degrees make it to the upper echelons than men? It seems so.

If that's the case, industry is doing better than education in encouraging and promoting women. Perhaps it is even discriminating in favor of some.

To blame every condition of man on discrimination seems to be the chief characteristic of our age. Perhaps that blinds us to some other causes which ought to be investigated and treated.

J. Jensen
Dan Diego, Calif.

Insensitive View of DPers

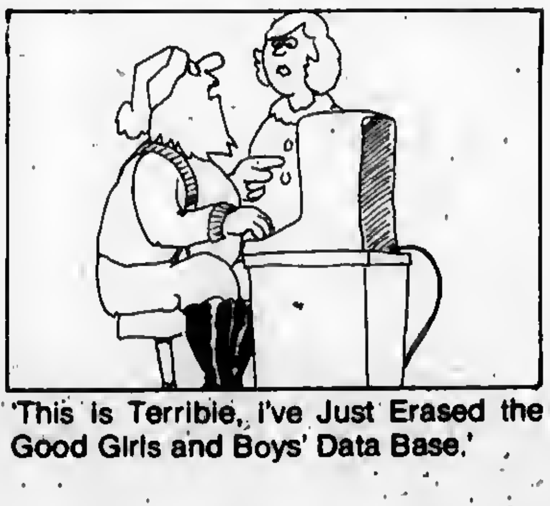
Please spare us any more Joan Hendrickson in the "Human Connection" column. She has all the human warmth and compassion of Louella Parsons, only she doesn't write as well or include any spicy details. Her views on the humanity or lack thereof in computer people are tedious, banal and useless, seemingly limited to gasps of distress at how cold, unemotional, unfeeling and incapable of love all us DPers are.

Being a computer person myself, and therefore ipso facto cold, unemotional and so forth, I find it hard to understand why she ticks me off so thoroughly that I am writing this letter. I have found my professional colleagues to be widely varied in personality, emotional depth and spiritual orientation.

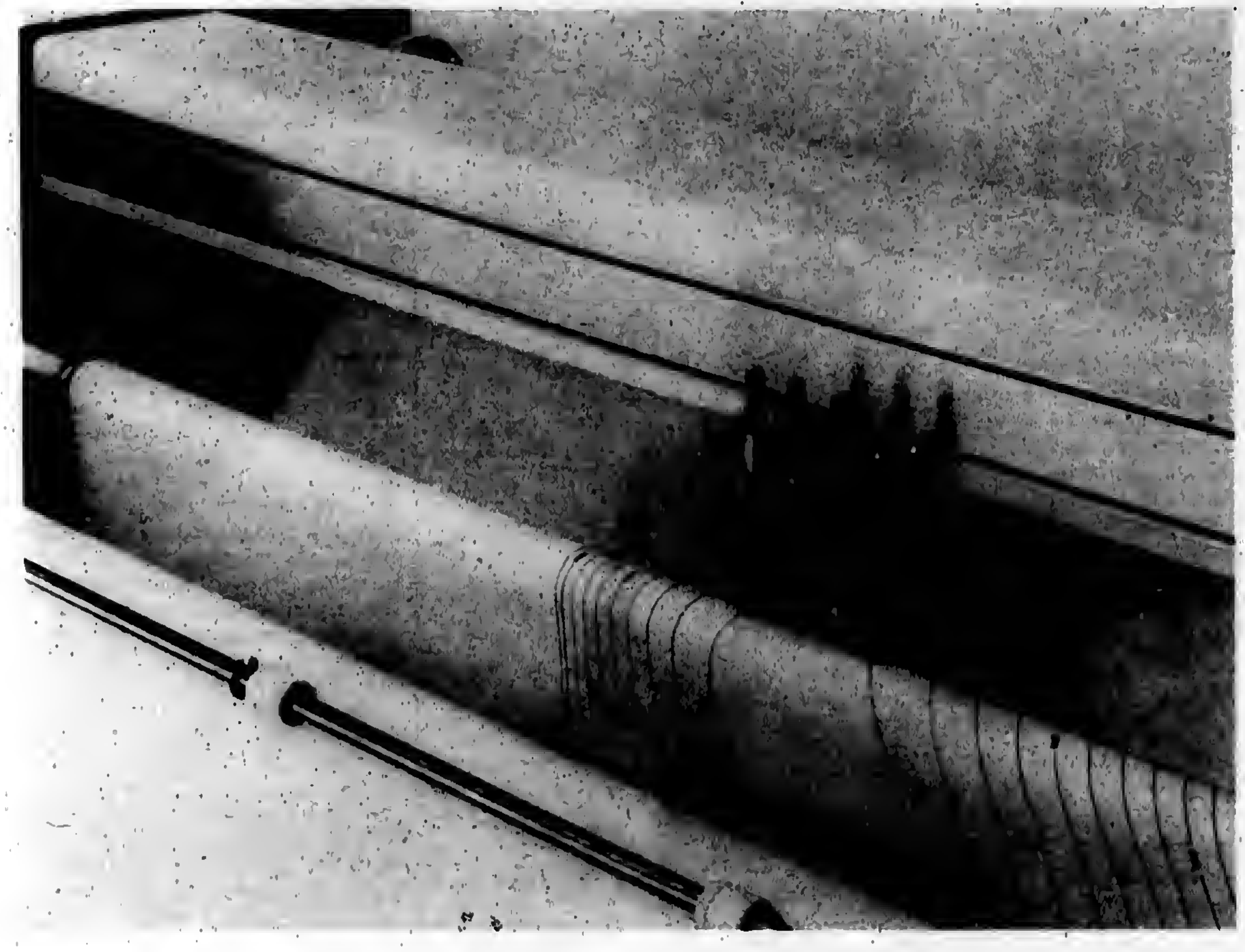
Perhaps my experience of human relations specialists has led me into the same indefensible stereotyping of which she is guilty, since I find her predictably glib and irrationally convinced that "love" means spending several hundred dollars to sit around in an artificial emotional hothouse having warm feelings toward total strangers.

Or perhaps I feel that enhanced interpersonal communication skills are important enough to all of us, both as professionals and as individual human beings, that those skills and their importance should not be trivialized and made alien by insensitive articles like Hendrickson's.

Roberta M. Taussig
Beaverton, Ore.



'This is Terrible, I've Just Erased the Good Girls and Boys' Data Base.'



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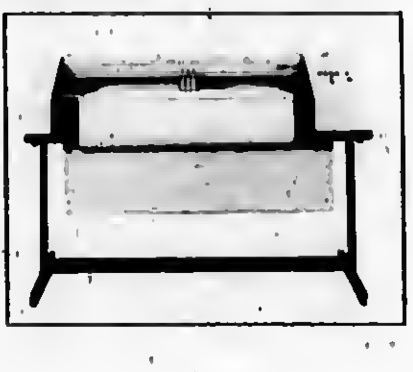

Letters to the Editor

Mumps Programmer On Zip Code Change

All these computer people fussing and fretting about the post office wanting to increase the size of the Zip Code just shows one thing: They jumped on the Cobol bandwagon and now they're paying for it.

Fixed-length fields are inefficient and hard to modify. The real world is variable-length, but simple-minded systems programmers take the easy route in operating system design and force applications programmers to pad and unpad worthless spaces in their files in order to fit into the fixed-length scheme.

Now if they were using Digital Equipment Corp.'s Ansi Standard Mumps (DSM), there would be no reason for any changes. All DSM files are maintained as variable-length, compressed fields in the self-optimizing B-tree, (see Don Knuth's "Art of Computer Programming," Volume 3). Regardless of the size (to a 255-character limit), range of values or frequency of occurrences, a near-optimal access path with a disk storage efficiency of 75% (95% in static files) is guaranteed.

I have nothing to do with DEC's marketing of DSM. I am only a Mumps programmer, tired of seeing so much RSTS, RSX, OS, DOS and so on when DSM's B-tree makes them look pale in comparison.

But at Mumps' current 80% growth rate per year, I guess I can wait the few years it will be before the world finally sees the light.

Charles Volkstorf
Northboro, Mass

No Account at Irving Trust

A story in the Nov. 13 issue of *Computerworld* concerning the $10 million theft from Security Pacific National Bank stated that S.M. Rifkin, the alleged culprit, had the money deposited in his account at Irving Trust Co. To our knowledge, Rifkin has never had an account with Irving.

The properly authenticated message from Security Pacific, relayed to Irving via the Federal Reserve Wire, instructed Irving to deposit the funds in favor of a Swiss correspondent bank.

David E. Santos
Assistant Secretary
Irving Trust Co.
New York, N.Y.

An Unfair Shake

It is not uncommon at all to see headlines bringing attention to "computer fraud" cases or "computer error" embarrassments. We in the DP industry know that the vast majority of those incidents (if not all) are not "computer" caused but very directly related to human errors.

The general public reads these headlines and another doubt is cast for the computer and its place in our environment.

Hopefully, the public will read the entire story and if people have even a small understanding of DP, they can see that it was truly man that made the error, not machine. Regretfully, however, the true source of the error is not made apparent by the writer of the story or is not understood by the reader.

I suppose all the foregoing can be attributed to nature in that it is much easier to relay blame for error to unfeeling machines than to accept it ourselves. What really bothers some of us in the DP industry, though, is the fact that when the tables are turned, where are the headlines?

The average newspaper editor apparently sees no interest in the fact that a computer uncovered a fraud or an error, or at least not nearly as much interest as in allegations that a computer caused a fraud or error.

Even our own Computer*world* is guilty of this reporting but, thankfully, to a lesser degree. "Williams Found Guilty" [CW, Dec. 11] was a rather small and inconspicuous article compared with most articles pointing out alleged computer frauds and errors, at least it's there and that is more than we will get from the average newspaper.

However, I would rather have seen the headline read "Computer Uncovers Fraud."

Ron Mitchell
Marshall, Mich.

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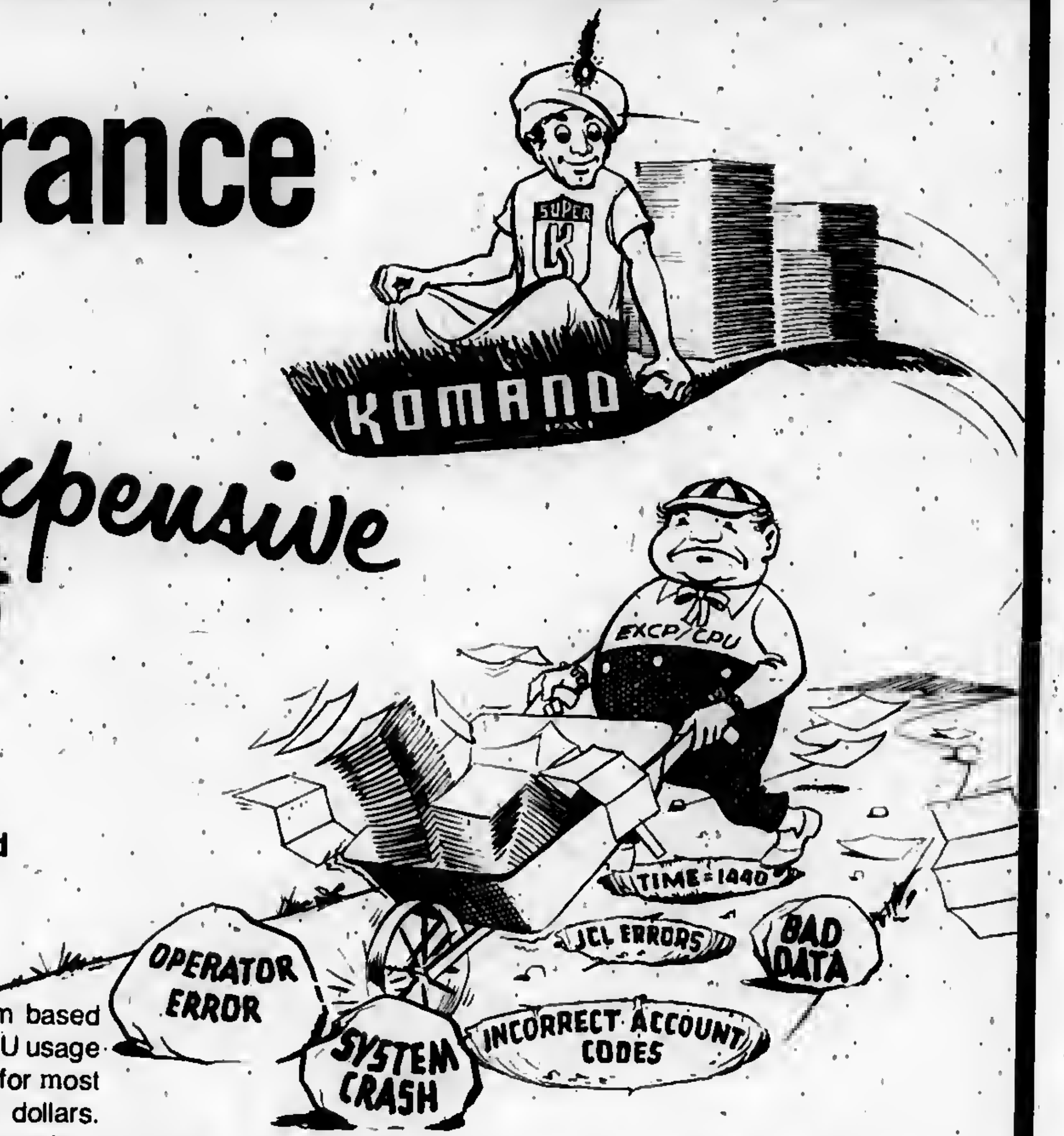

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Expanding Budgets Mean Bigger Challenge

(Continued from Page 20)

als being trained. Although unmentioned in the survey, the principal constraint on expanded training, in my experience, is the "time away from the job."

Job Category	Average Days In Training
DP Management	6.0
System Analysis	10.7
Application Programmers	14.2
System Programmers	8.9
Operations Personnel	9.4

Although managers recognize that training is essential in such a dynamic field, the project schedule seems to put up "blinders" to anything but the near term.

Obviously, the productivity increases from application of new concepts and techniques should far offset the loss of productive time for training classes.

Trainers were asked, "What is the most serious problem you face in carrying out your training job?" The majority of responses fell into five categories:

- Maintaining high-quality, up-to-date and complete training programs (33 responses).
- Lack of support from management (21 responses).
- Time for training (13 responses).
- Lack of qualified training staff (13 responses).
- Budget constraints — high cost of training (seven responses).

Because it is a training organization, Brandon is quite interested in providing assistance in the first and fourth areas. Those of us in academic institutions can also aid in resolution of those problems. Faculty members in a local academic institution have been employed by training directors to aid in designing a career development program for each job category; delineate skills required to maintain a competency in each job category; identify sources for training in each skill area; and perform some of the training.

In some communities, industry and academia work closely to ensure job entry skills and maintenance of those skills.

While the average dollar amount ($518) per person seems quite low, it needs to be expanded by the salary during the time for training. For application programmers, the average salary is $300 per week (*Datamation*, November 1978). So the actual cost of training for programmers was $683 plus $852 (14.2 days at $60 per day) or $1,535.

These statistics remind those of us in the training/education field that we have a precise target. Will knowledge gained in our programs enable a person to recoup the 5% to 8% loss in productive time?

On the other hand, we must also beware the blinder syndrome. We can concentrate so much on the immediacy of the results of training that we neglect the need of the trainees to learn concepts as well as techniques.

Couger is professor of computer and management science at the University of Colorado.

Firms Provide Useful Service

(Continued from Page 19)

ing kept up-to-date with the findings of the U.S. Department of Agriculture (USDA).

People are aware of some missing items. At the moment, cottage cheese recipes cannot be handled, but once the USDA publishes the nutritional ingredients of cottage cheese in its handbook, that situation will change.

This Pillsbury-Honeywell collaboration shows how computers can be used to tackle everyday human problems with the facilities and the knowledge of the manufacturer, the newspapers and the government.

Sugarless Apple Pie

I particularly enjoyed hearing how Gwen Jankowski of St. Paul, Minn., successfully attacked the problem of providing three diets for her family. She needed one diet for her husband, who suffers from high blood pressure, a sugarless one for herself and a nonacidic one for her daughter.

Her sugarless apple pie is pictured on the front of the Pillsbury brochure advertising its data bank.

As our understanding of important ingredients in individual diets increases, the information in the data bank should broaden and newspapers across the country should be able to give better service to readers of the food columns.

As a result of my wife's recent heart attack, I am particularly interested in the subject. We are facing some of the same problems Jankowski faced. A lot of our friends face similar problems. So this nutritional information will certainly be useful.

Because of the hard work and cooperation of Honeywell and Pillsbury, this nutritional help is offered nationwide. Let's wish them and the data bank an especially Happy New Year for showing us how computers can be used for everyone's benefit.

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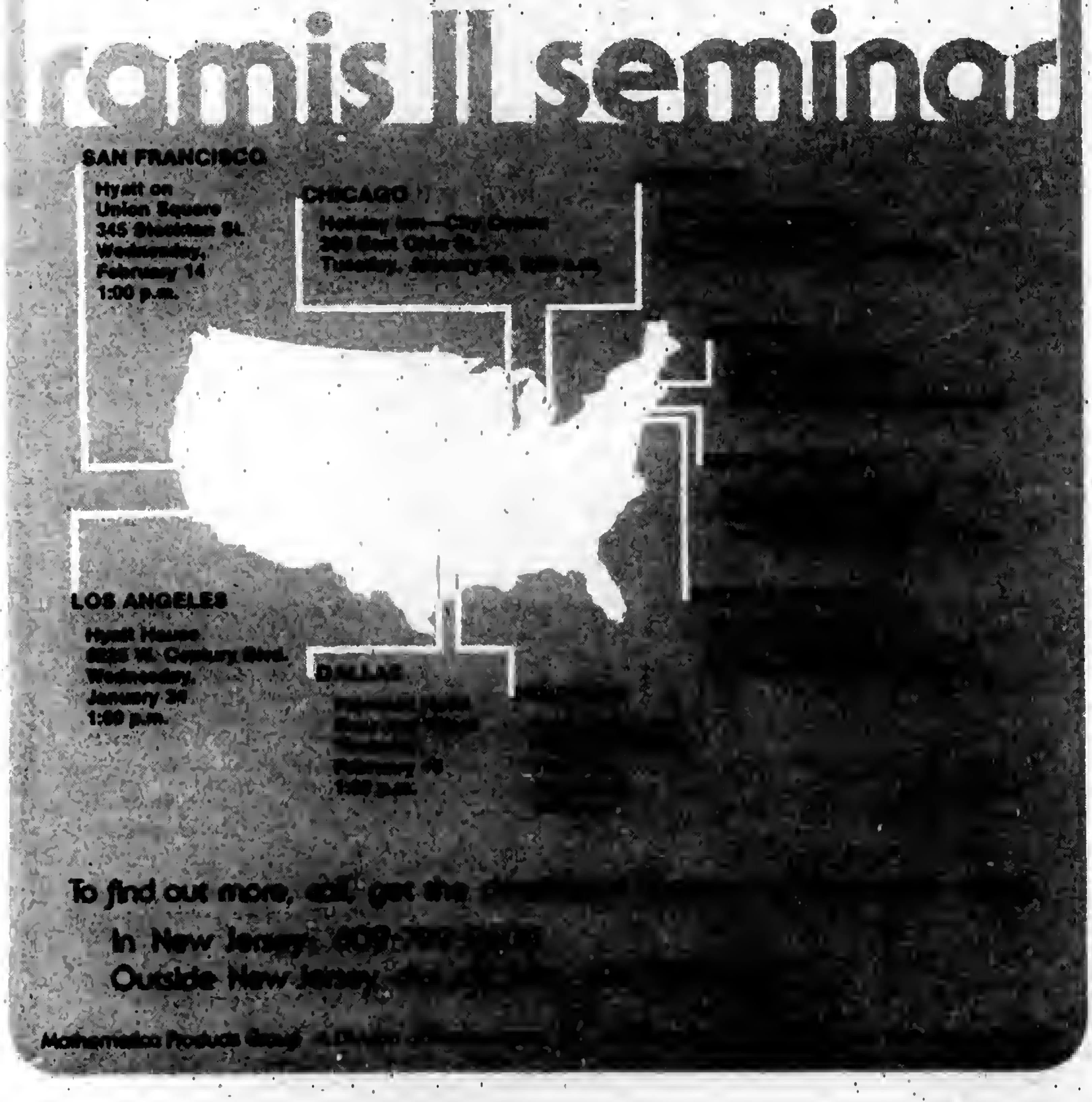

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A Good Year Overall

1978: Enhancements, Not Breakthroughs

By Don Leavitt
CW Staff

During 1978, users got the word across, in user group meetings and elsewhere, that they want — indeed, need — better tools than they had to meet the continuing pressure from upper management to be both efficient and effective. The vendors apparently heard them; the dominant theme in press releases was enhancement of products that users had found useful.

While there were no major breakthroughs, there were, of course, some major products that did emerge during 1978. The availability of PL/I for Data General Corp.'s Eclipse, for IBM's Series/1 and for Digital Equipment Corp.'s PDP-11 — from a mix of vendors including the hardware vendors and independent software houses — marked the interest users had in getting capabilities developed on mainframes to work for them on the smaller systems.

Perhaps the growth in availability of Pascal compilers for many machines — but especially the smaller ones — was a similar marker, but with a twist. Pascal never was a heavily used language on mainframes, and it wasn't developed or supported by any of the giants of the DP industry. It was and is a user language, and its growth is a clear indication of what serious user support can accomplish.

During 1978, Pascal even came within the interest of the American National Standards Institute (Ansi) and other standards-setting organizations as a proposal to formalize the language (and presumably stabilize it against ineffective variations) gained consideration by Ansi's Standards Planning and Requirements Committee (Sparc).

Review & Forecast

Ansi was busy in other software-related areas as well, approving an updated standard for Fortran — delayed so long that the informal title "Fortran 77" was also recognized, even though 1978 was the year in which the update was sanctioned — but stalling, then trying hard to move ahead again on the sticky subject of data base management systems (DBMS).

Early in the year, the pages of various publications, *Computerworld* among them, and various conferences rang with a debate about whether the Codasyl specifications for a DBMS should be recognized as *the* standard. One study group set up by Ansi died in 1977, but the institute put a group together late in 1978 to take a fresh look at the subject.

APL Standard?

The potential for some sort of APL standard attracted an overflow crowd to a series of seminars in New York City in the spring. On the other hand, Scientific Time Sharing Corp.'s (STSC) introduction of its Automatic Control of Execution (ACE) enhancements to its own APL system seemed to pinpoint one of the problems users of that language have.

STSC called that problem "the tyranny of the terminal" and said ACE would overcome it by allowing users to work with APL development in a conventional interactive mode but let the system function in a batch tempo once the programs were ready for production use.

Various readers and competing vendors, however, countered with claims that they had had similar capabilities, under different names, for years.

The line between word processing and data processing — if it really ever existed — became more blurred during 1978 as vendors on both sides of the line added software to reach across.

Amdahl Corp. began to introduce its own software products this year rather than depend almost entirely on IBM. Both Amdahl offerings — MVS/SE Assist in mid-summer and a VM Performance Enhancement (VM/PE) package in late fall — still work with IBM software, but they suggest the possibility of the West Coast mainframer going further in the new year.

Summit Operating System, Options Support Univac Minicomputer User

IRVINE, Calif. — Sperry Univac Minicomputer Management of Interactive Terminals (Summit), a multitask terminal-oriented operating system for Univac's newly announced V77-800 minicomputer as well as the older V77-600, supports four modes of terminal operation.

In addition to various language facilities that are standard components, the system includes several optional, extra-cost features to extend the user's capabilities even further. Among those features are support for Pascal and a query/update language (QL/77) for operations under Cincom Systems, Inc.'s Total data base management system, a spokesman noted.

Summit supports time-sharing, transaction processing, on-line program development and remote job entry (RJE). It also provides remote processor access from any terminal balanced with a security system to avoid unauthorized access, the spokesman said.

The operating system's Distributed Processing Modules are said to allow Summit-supported terminals to access Univac Series 90 or Series 1100 mainframes, remote V77 minis or IBM 370s.

In addition to Pascal, Summit backs Cobol, Fortran IV, Fortran 77, RPG-II and assembly languages. Pascal is supported as a component of Summit's Structured Programming System (SPS), which allows the user to enter, edit and compile programs for execution under Summit.

SPS also includes a diagnostic facility enabling the programmer to execute a line at a time, a paragraph at a time or an entire program.

QL/77, developed by Univac, provides a means of handling data managed under Total. In common with other on-line query systems, QL/77 allows the user to create a procedure and then store it for later reuse.

Summit Cobol is said to be an implementation, primarily at Level 1, of the 1974 ANS specifications. Fortan IV is a "fully implemented" superset of ANS Fortran, presumably the 1966 specifications.

Only on V77-800

Summit Fortran 77 is available only on the V77-800 with accelerator firmware and floating-point processor. This feature provides "extremely fast" computation using 32-bit single-precision and 64-bit double-precision numbers, the spokesman said.

The earlier Vortex II operating system will continue to be available.

Summit costs $6,000, with the Pascal software available for an additional $2,000 and QL/77 tagged at $3,000, the company said from its minicomputer headquarters, 2722 Michelson Drive, Irvine, Calif. 92713.

NCR Aids Cobol Switch

DAYTON, Ohio — Software that converts programs written in older versions of Cobol into ANS Cobol 74, announced recently by NCR Corp., can now be used on the company's Century 101 or more powerful systems, including N or V mode 8000 series processors, according to a spokesman.

The Automatic NCR Source Word Evaluation Routine (Answer) accepts source programs on punched cards, magnetic tape or disk and reportedly helps minimize the cost of translating programs to take advantage of the extended capabilities of Cobol 74.

Answer converts file-specification-sheet information to the "new descriptive file phrases" of Cobol 74.

The conversion package also produces an annotated listing which shows those lines which required translation together with the statements that replaced them. Since much of Cobol 74 is a carry-over from Cobol 68, a good percentage of any program requires no translation.

The spokesman said a user with more than 50 programs might expect to spend as much as 480 programmer hours on the changeover. With Answer, however, the process can be reduced to about 75 programmer hours, he claimed.

Requiring a system with a 64K-byte or greater memory, two disk units and a printer, the conversion software operates under NCR's Virtual Resource Executive (VRX) as well as earlier operating systems. Answer is available for a license fee of $6,000.

Contracts Studied

MANCHESTER, England — Guidelines for software contracts, which will be published as a handbook, are being developed by a working party of National Computing Centre Ltd. members joined by a representative of the Institute of Purchasing Officers (IPO).

The investigation should help DP and other managers understand the nature of sales contracts in general and software contracts in particular, better equipping them for the negotiations that are becoming prevalent as software acquisitions increase, according to a spokeswoman for the National Computing Centre.

Chaired by the center's group director, E.D. Scriven, the committee is made up of eight people including J.H. Coombs of the government's Central Computer Agency, E.R. Sambridge of IPO and members of the center's Scottish region.

No timetable for publication of the handbook has been announced. More information is available from Scriven at the National Computing Centre, Oxford Road, Manchester M1 7ED, England.

Nercomp Sets Meet Plans

WELLESLEY, Mass. – The New England Regional Computing Program, Inc. (Nercomp) and Dartmouth College will co-sponsor a two-day conference on instructional computing Jan. 19-20, at the college's Hanover, N.H., campus.

Session topics will include courseware development, faculty skills in instructional computing, historical simulations and the use of terminal graphics in the instruction of organic chemistry. The role of computer-managed gaming in agribusiness courses and the teaching of undergraduate macroeconomics with the Modsim software simulation program will also be covered, a spokesman said.

Prof. Eugene Ott and Dr. Nancy Kolodny of Wellesley College, Prof. Michael Carter of Dartmouth and Carl Van Duyne of Williams College will be among the conference's featured speakers.

Two-Tier Fees

Registration fees are $50 for the initial registrant and $30 for each additional registrant from the same institution. Nercomp members will be charged $30 for the first person and $15 for each additional person from the same school or company.

Details and information about Nercomp or the conference is available from Linda Maynard at Dartmouth's Kiewit Center or from Nercomp, 40 Grove St., Wellesley, Mass. 02181.

Programs Handle Basic DP For Ohio Scientific Users

NEW YORK — A trio of programs — Filgen, Update and Format — to handle basic DP chores on an Ohio Scientific, Inc. Challenger II or III microcomputer is now available from Better Programming Systems, Inc. (BPS).

Filgen creates a special header at the beginning of OS-65U(c) data files to facilitate generalized processing of the files by the Update and Format programs, a spokesman explained. Each file record can be 255 characters long with as many as 18 fields, he added.

Update is used to add and change records in a file. A set of six commands is available to work with the file, but none of the commands appears to allow the user to delete a record once it is on the file.

Format is used to design printed reports and CRT screen displays. As many as eight files can be used concurrently, though the spokesman acknowledged such use would make processing "very slow."

The formatting is controlled by abbreviated "shorthand" commands to indicate spacing, skipping, captions for top and bottom of pages and similar repetitious information. Record selection criteria are keyed to field names, the BPS source noted.

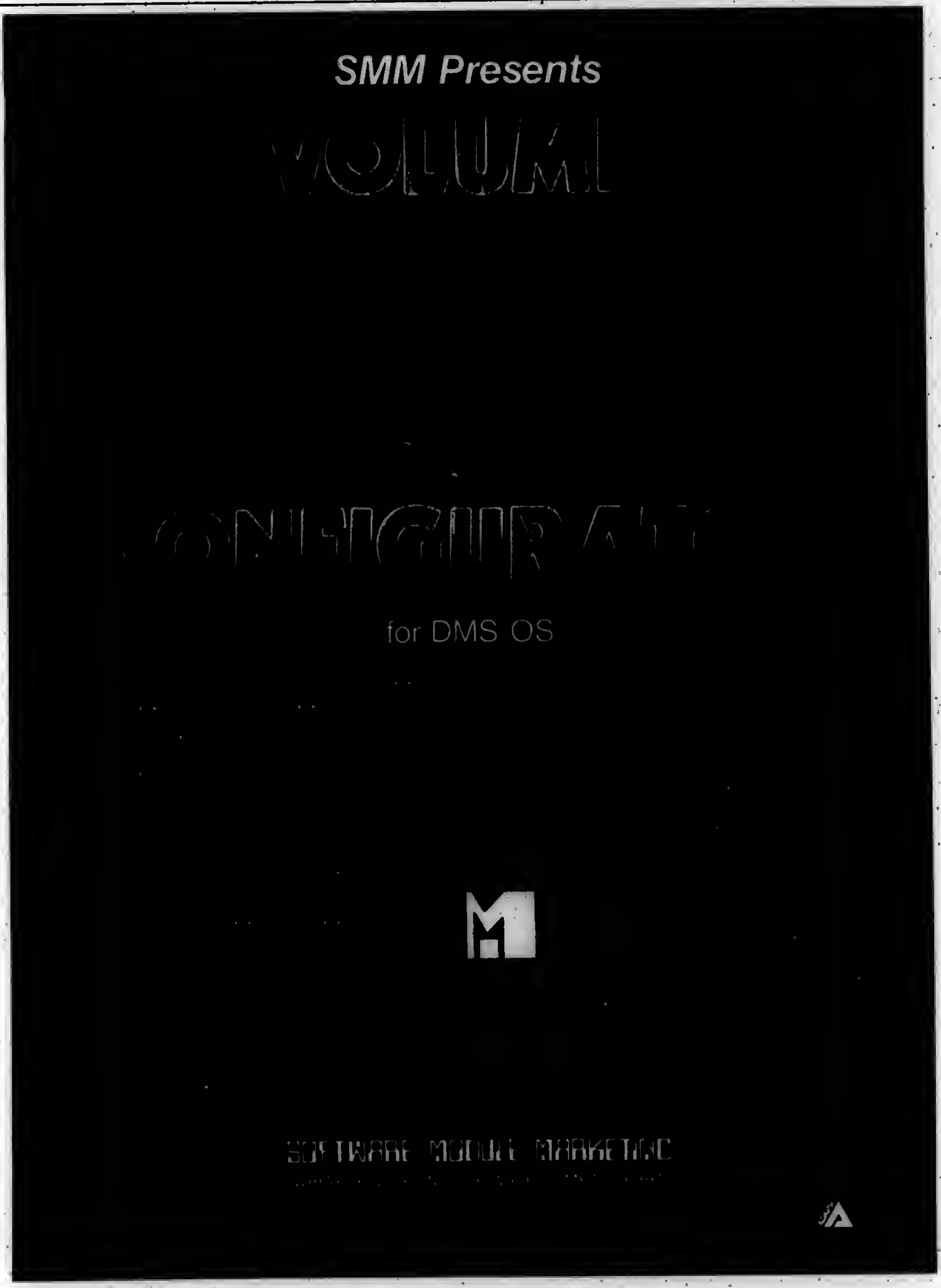
Selection Choices

Records can also be selected using "less than," "greater than," "equal to" or "not equal to" criteria. Randomly stored data can be sorted into numerical or alphabetic sequence before being printed or displayed.

Formatting routines can be saved by name for future use, the spokesman added.

The three programs run on a 48K-byte Challenger II or III. A Hazeltine Corp. 1500 CRT is recommended by BPS for use with these processors.

The three-part software system costs $500; future revisions will be sent to all system owners who send a floppy diskette and $20 to BPS at 275 Fort Washington Ave., New York, N.Y. 10032.



'Docgen' Builds User Documents

ELMHURST, Ill. — An on-line system designed to ease the creation of standardized system and program documentation on Datapoint Corp. equipment, Docgen is available from Efax Corp.'s Computer Systems Division.

Described as a series of Databus programs that execute under Datashare, prompting the user to enter pertinent, comprehensive information, the software is modularized to meet the using installation's needs, according to a spokesman.

Five modules focus on differing aspects of the documentation problem, he explained. They produce an overview narrative, equipment configuration description, system and program flow diagrams, program user's guides and file and record definitions.

Table of Contents

The system produces a table of contents along with the documentation itself. Functionally, Docgen serves as a front end to Datapoint's word processing utilities, Dscribe and Mscribe, embedding the special characters they require to format output.

Docgen users do not have to know the internals of Dscribe and Mscribe, Efax said.

Although processing of the Docgen output files by Dscribe and Mscribe must take place under Datapoint's disk operating system, all printing is performed under Datashare using print files via Docgen's print control supervisor, the spokesman added.

Distributed in object code only, on cassette or diskette, Docgen costs $1,750 under permanent license from Efax at Suite 202, 880 N. York Road, Elmhurst, Ill. 60126.

Mini Systems to Grow Too in '79

IBM Relational DBMS Seen Tied to Series E

By Stephen L. Robinson
Special to CW

Data Base Corner

The Nov. 7, 1977 issue of *Computerworld* contained the first fearless forecast. Before embarking on new forecasts, I believe we should examine last year's:

1. *"Vendors of data base packages will expand their offerings of complementary software."*

Certainly true, although some of the package integration I anticipated did not materialize.

2. *"Data base packages on minis will be a hot item."*

Maybe not hot, but certainly lukewarm. Software AG's Adabas has been announced for the Digital Equipment Corp. PDP-11, where it will compete with Cullinane Corp.'s IDMS, Cincom Systems, Inc.'s Total and others.

3. *"Many small businesses will become disgusted with computers and data base."*

Surprisingly, not as bad as anticipated. Businessmen are being properly conservative about acquiring minis and are usually buying end-user systems that truly match their requirements.

4. *"At least half a dozen large DP installations will change data base packages."*

This was a pretty safe prediction. In any given year, more than half a dozen switch from IMS alone.

5. *". . . major data base packages . . . advertising that suggests they are relational and/or distributed."*

I am very happy to have been wrong here.

6. Unfortunately, I was right in that advertising in DP continues to be unregulated.

7. I hereby reinstitute my 1978 IBM predictions for 1979.

8. *"At least two major software houses will announce data base packages."*

Well, almost. Applied Data Research, Inc. (ADR) is acquiring Datacom; Intel Corp. has acquired MRI Systems Corp. and its System 2000 (S2000). All right, Intel is not a software house . . .

9. *". . . application software which is compatible with data base packages."*

Not as much as I guessed.

10. Data base machines. Coming along nicely, thank you; but not off the shelf yet (as predicted).

11. Data dictionaries. Certainly selling well, if not like hotcakes.

12. Codasyl recommendations. Once more, not accepted.

Scoring one point for a correct prediction and one-half point for a partly correct prediction (and counting Intel as a software house??), last year's score was eight out of 12.

Moving on to '79

This year we'll try to do a bit better.

- IBM will announce a new data base package, relational in nature. This announcement will probably be timed to coincide with the release of a new hardware line (e.g., the E or H series). The relational package will not come with an IMS-relational bridge.
- To pacify its IMS users, IBM will announce a hard-wired DL/I for forthcoming hardware. To prolong the life of IMS, and further placate existing users, the relational package will be advertised as being for ad hoc query environments, while IMS will be boosted as the standard for "standard" processing.

In the absence of associate memory, the relational system will be a large consumer of computer resources. This will be further compounded by an English-like query language for the relational data base package.

- The move to minis will continue. IDMS and Total presently lead in this category. Adabas has already announced a full-blown PDP-11 version for January. Datacom and S2000, under their new owners, should be entering the marketplace late in 1979.
- The move to minis will be paralleled by a move to micros. Seed, a Codasyl-patterned package, is already available on a micro. I do not expect other packages to be released for micros in 1979, but it is possible that the end of the year may see some announcements for 1980.
- Both Datacom and S2000 will achieve considerably more success under their new owners, ADR and Intel, both of whom have more experience in software marketing than do their former owners.
- The major data base packages will continue to stress their end-user appeal. Look for query languages operating through data dictionaries; this should provide a high degree of independence from DP names and structures.
- The number of technical data base failures (systems in which excessive computer resource requirements or elapsed run times result in termination of the system project or, more unfortunately, the production system) will increase in parallel with the above cited trend toward end-user systems. The reason is quite simple: Too many users are taking too seriously the now familiar "hardware is cheap and getting cheaper; people are expensive and getting more expensive."

While the statement is true, it is no excuse to ignore design efficiency. A data-based, modular, structure-analyzed, structure-designed, Hipo'd, structure-programmed payroll system that takes 27 hours to generate 4,000 checks (as one did that I saw recently) will be discarded.

The years 1979 and 1980 will be the years of On-Line. Again, unfortunately, look for many failures as batch system logic is simply implemented via terminals. Too many organizations have failed to recognize the need for new systems analysis.

Robinson is an independent data base consultant operating as S.L. Robinson & Associates in Morrisville, Pa.

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Work on Series/1 Backed

THORNWOOD, N.Y. – The EDX Commercial Applications Subroutine Library I has been introduced by the Systems Guild, Inc. to provide commonly needed algorithms for commercial work on IBM Series/1 minicomputers running under IBM's Event Driven Executive (EDX).

Twelve subroutines falling in four basic categories are provided. Working from the $IMAGE utility, the subroutines that enhance static screen formatting provide mapping from disk to screen and back. Others in this group display binary data with a decimal point, a spokesman noted.

String manipulation subroutines provide right and left justification of data in an Ebcdic field. The user specifies the length and address of the Ebcdic field. The subroutines can also compare for greater than/less than values, he added.

A sort facility for working with internal arrays enables the user to specify the address of the array to be sorted, the dimensions of the array, the position and length of the sort key within each element and the location of a work area that must be equal in size to one element in the array.

The fourth category supports date conversions between the Julian and Gregorian calendars and the calculation of differences between two dates.

Library 1 costs $300 for the user's first machine, from 10 Westlake Drive, Thornwood, N.Y. 10594.

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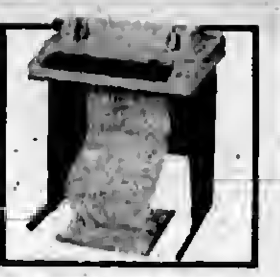

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VLDB Conference Planned

PHILADELPHIA — The Fifth International Conference on Very Large Data Bases (VLDB), sponsored by more than half a dozen professional organizations, will be held Oct. 3-5 in Rio de Janeiro, and U.S. Program Chairman Howard Morgan of the University of Pennsylvania has issued a call for papers to be submitted by March 5.

"Practically oriented survey and tutorial" papers up to 5,000 words long are sought on a range of topics. These include — but are not limited to — data base design, data base software engineering, data base applications and data base machines, he said.

Other possible topics are distributed data bases, data semantics and modeling, user interfaces and implementation considerations, the professor added.

In addition to the formal papers, extended abstracts — two typed pages long — that discuss applications of data base technologies in developing nations are also sought.

Abstracts, papers and requests for more information about the conference should be directed to either Morgan at the Wharton School, University of Pennsylvania, Philadelphia, Pa. 19104 or to Latin American Program Chairman Antonio L. Furtado, Departamento de Informatica, Pontificia Universidade Catolica-RJ, Ru Marques de Sao Vicente, 209-Gavea, Rio de Janeiro, RJ, Brazil.

World Energy Sources, Uses Matched by Model

BETHLEHEM, Pa. — Developed through support from the Exxon Education Foundation, an introductory world energy model and its Fortran IV implementation are now available from the Department of Chemical Engineering, Lehigh University.

The model is "aggregated and relatively low order," according to Prof. W.E. Schiesser, who explained that it does not address in detail international energy flows and markets. Rather, the basic structure and underlying principles can be applied to more complex international energy systems.

The model is a rather unique combination of dynamic, differential equations and a constrained economic optimization performed at each point in time. The constraint ensures a balance between supply and demand in final or secondary energy, the professor added.

The optimization establishes interfuel substitution between five primary energy sources — gas, oil, coal, nuclear and "advanced sources" — according to a supply function for each source and a demand function for final energy.

During the optimization, nonnegativity conditions are imposed on the production rates of the five sources, Schiesser noted.

The model's output moves through time and includes the level of reserves, production rates, investment in exploration and development, prices of the five primary energy sources and the price and demand for final energy.

The Fortran IV implementation includes approximately 1,700 cards, a listing and output of the model base case and a user's manual. The package costs $50, payable in advance.

Checks should be made payable to Lehigh University and addressed to Schiesser at Whittaker Laboratory No. 5, Lehigh University, Bethlehem, Pa. 18015.

Package Handles Freight Ratings

S. HOLLAND, Ill. — Freight shipping information, tariff rates and commercial transportation charges are said to be part of a software package designed by the Transportation Data Management Co. (TDM) for users of IBM 360/370 or Digital Equipment Corp. PDP-11 CPUs.

The First Rate system facilitates the shipping of cargo from one point to another by providing the latest destination, duty and load weight figures in a rating and auditing data base, a spokesman said. The system functions under IBM CICS and Vsam under VS1 or VS2, or under DEC's CTS500 operating environment.

The software's shipping information reportedly meets standards prescribed by the Transportation Data Coordinating Committee and the system supplies rate retrieval, bill of lading rating, warehouse location and freight accounting statistics. First Rate also provides rate audit before and after payment, assembly and distribution surveys and management reports, the spokesman continued.

The programs are written in Cobol and available in motor carrier, rail, freight-forwarding, ocean, barge, air and private fleet operation modes.

First Rate costs $150,000 and information updates are provided by TDM at a price based upon individual user needs, the spokesman explained. As a service, it is also available on a time-sharing basis from the Illinois-based company.

A mileage calculation package that breaks destinations into 3,300 key points and computes shipping charges according to miles is also offered by the firm for $30,000 minus data.

Information about the software package and other services can be obtained from TDM at 1451 E. 168th St., S. Holland, Ill. 60473.

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The Key Word in 1978? 'Integration'

By Ronald A. Frank
CW Staff

NEWTON, Mass. — "Integration" was the key word in the communications field this past year. Technologies, services and equipment all phased into integrated modes, and there was talk of more to come.

Archie McGill, director of market management at AT&T, described the impact merged technologies will have on users when he said that voice, data, image, message systems, sensor-based data and office operations can be part of a single processing system that would benefit the company and contribute to earnings per share.

As the year began, Satellite Business Systems (SBS) demonstrated how satellite links would provide new services on integrated facilities. High-speed data, high-speed facsimile and teleconferencing were shown as part of Project Prelude to whet the appetites of a few selected large users.

A library in Texas began using a fiber-optic circuit to transmit data from a terminal to a CPU and, at various conferences, several firms began to demonstrate limited-distance fiber-optic systems for data transmission.

Motorola, Inc., introduced a portable terminal that combined RF radio frequencies with more conventional DP transmission devices to allow remote input to a DP center.

The Consultative Committee on International Telephone and Telegraph (CCITT) paved the way for integration of public packet-switched nets on an international basis when it approved the X.75 gateway interface for interconnecting X.25 networks.

Review & Forecast

The elusive office of the future came a bit closer as users began to talk about combining functions that are now separate. Several users connected word processing equipment to the DP center, and the computerized PBXs promised to combine voice data and other types of transmissions through a common control point.

Even packet nets no longer relied on a single technology to achieve their service goals. In some places, hybrid nets integrating packet-switched and fast circuit-switched technologies were implemented.

A major step in the evolution toward integrating computer and communications came when AT&T unveiled its Advanced Communications Service (ACS) at mid-year. Aside from the regulatory questions it raised, it became clear that AT&T intends to support a long list of terminal types that would otherwise be incompatible. The possibility of running diverse equipment through a single integrated network held great promise for the user.

A previously defined boundary separating packet-switched circuits from private-line nets was blurred when both Telenet Communications Corp. and Tymnet, Inc. introduced private net versions of their packet technologies. A few larger companies began to configure in-house packet nets along these lines.

At mid-year, a rewritten Communications Act was introduced that would allow both monopoly and competitive services to operate side by side. But competition proponents in the House of Representatives were fearful that Bell would use its clout to exact an unfair advantage.

Network architectures lost much of their rigidity during the year. Digital Equipment Corp. introduced software that allowed previously incompatible operating systems (and CPUs) to operate together under Decnet. IBM announced a half-duplex protocol for remote batch work for its much touted full-duplex Systems Network Architecture (SNA).

Late in the year, users seeking a way to perform polling functions on packet nets looked at the 9100 network interface processor from Cambridge Telecommunications, Inc., and consultant Dixon Doll predicted a network "supercontroller" that would tie network functions into one system.

Xerox entered the network sweepstakes with its Xten entry, apparently aimed at document transmission, and General Telephone and Electric and Telenet began finalizing plans to merge at year-end.

As 1979 begins, it is clear that previously separate services are coming together and multifunction terminals are combining more and more communications operations into one unit.

The day of the single-purpose application network is disappearing in favor of services that will handle a variety of user needs. Through it all looms the prospect of decreased costs through integrated communications capabilities.

Most of the new services like ACS, SBS and Xten are shooting for 1981 start-up dates, and users are beginning to realize that the promised total corporate communications systems may be little more than a year away.

Net Architecture From DCC Gives Users DDP Environment

MEMPHIS, Tenn. — An architecture that provides an on-line, real-time distributed data processing (DDP) environment has been introduced by Data Communications Corp. (DCC). Called suitable for first-time DDP users, the Transaction Network Architecture (TNA) can integrate either a locally or remotely interconnected network of dedicated minicomputers, the vendor said.

Communications between processors is provided through standard leased telephone facilities or shared communications services, a spokesman noted.

Modular hardware and software components combine to yield only the required functionality at each processing node, he said, adding that this modularity allows configuration flexibility and is directed at the diversified DDP needs of such organizations as banks, manufacturers and freight handlers.

The architecture includes a number of remote clustered terminal controllers that can be main memory-based or disk-based, depending on requirements for local format storage, local file validation or store-and-forward capabilities.

The controllers poll available applications programs from host processors and allow remote terminal systems to particpate in their execution as if they were local, DCC explained.

A remote terminal may initiate transactions for both local and remote applications software provided by a host minicomputer, the

(Continued on Page 30)

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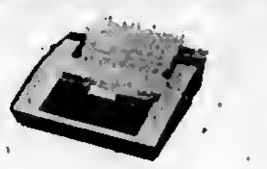

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NCR Adds Entry-Level Unit for Food Stores

DAYTON, Ohio — NCR Corp. has announced a food store electronic cash register which it said can be upgraded to Universal Product Code (UPC) scanning and later to an on-line terminal capable of communicating with an in-store computer.

The NCR 2140 food system was designed for those supermarket operations which do not need the full processing power of an in-store computer now, but may require that capability in the future; NCR said. It can be installed as a basic stand-alone system and can migrate to an on-line system linked to an in-store computer, with more powerful transaction processing and information handling capabilities.

Three model groups compose the 2140 system:

- The 2140-1500, which provides transaction-handling capabilities plus the ability to accommodate a number lookup feature, electronic scales and a consolidation feature. It will be available in the first quarter of 1979.
- The 2140-1600, which will be available in the third quarter of 1979 and includes all the features and options of the 1500 plus additional enhancements of those features and functions.
- The 2140-1700, which will be available in the fourth quarter of 1979 and includes all features of the 1600 system plus the capability to add mass memory, UPC scanning, common-carrier communications and data collection with cassette recorder. It also features the ability to share resources such as the large memory and the cassette recorder.

The models in the 1500 group can be upgraded to the 1600 and the 1600 can be upgraded to the 2140-1700 at the option of the user at a minimal cost, NCR said.

Basic models in each group are priced at $2,385.

Architecture Links Minis In On-Line Environment

(Continued from Page 29)

vendor explained. The TNA allows multiple language applications processing as transactions are received from either local or remote terminals attached to various dedicated modules of the total architecture.

The user interface to a particular application — at either a local or remote terminal — is independent of where the application is actually processed, DCC continued. TNA features include dual-processor configurations, multiple program execution, concurrent program development, mutiple languages — including Cobol, Fortran and Algol — and a "warm/cold start capability" combined with automatic recovery.

Dual-processor shared-disk configurations provide redundancy for critical applications, according to DCC. A Remote Processing System (RPS)/Dual configuration consists of two processors, connected by a high-speed interprocessor bus, which share a data base.

Multiprocessor configurations in the TNA permit multiple systems to be interconnected locally via special adapters. A Distributed Processing System (DPS)/Multi configuration offers the ability to process multiple applications by interconnecting single- and dual-processor systems, the vendor said.

File Management

TNA's network file management permits on-line file access through the Transaction Definition Language. Information from local or remote data bases may thus be accessed as an integral part of a transaction data entry procedure, the spokesman said.

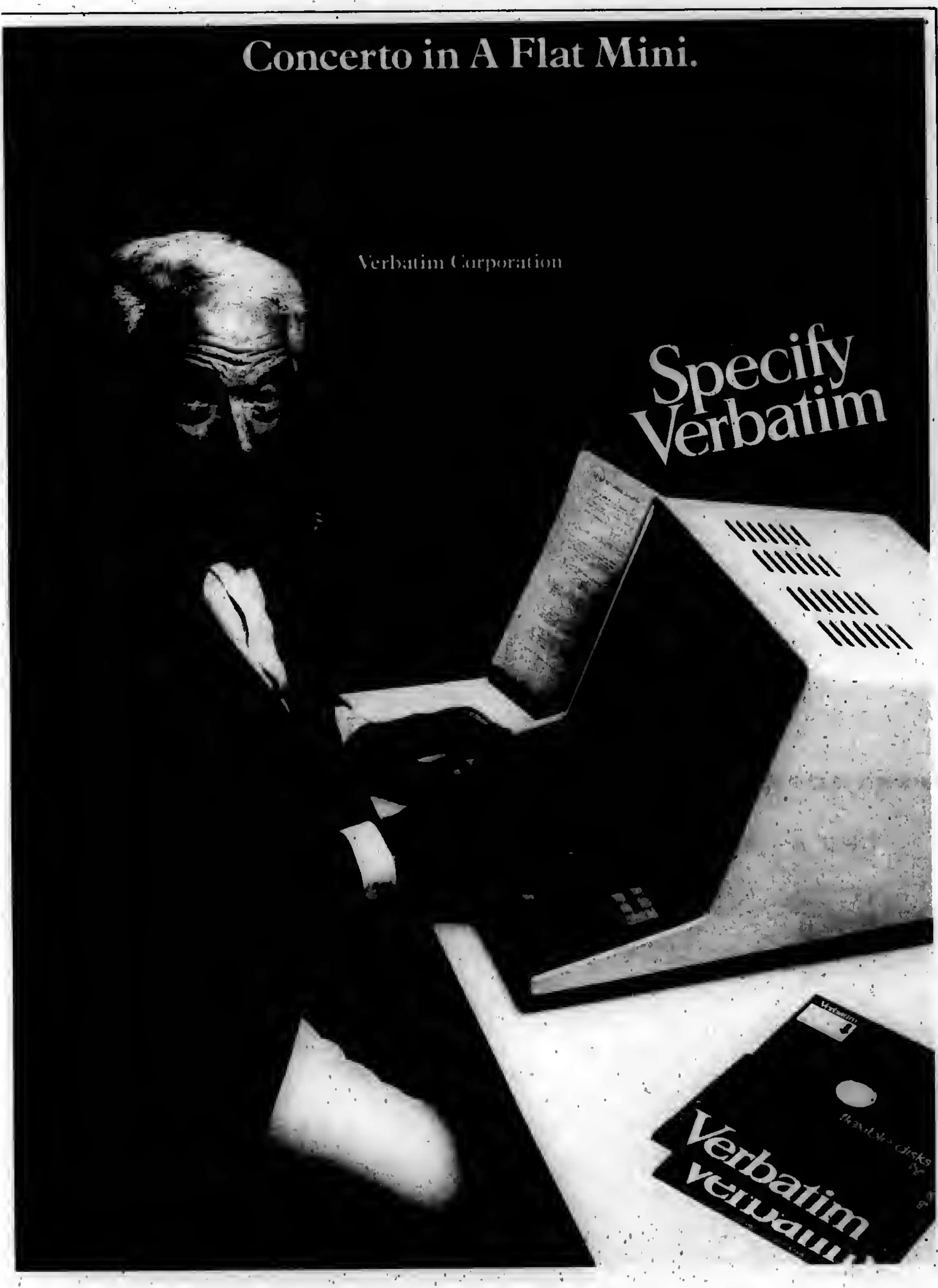
Network file utilities include a general-purpose file transfer and update facility so remote data bases — including program and validation files — can be easily maintained and updated, the vendor claimed.

Depending on the volume of data to be handled, systems can be linked to a TNA network utilizing either point-to-point or multipoint protocol. Both protocols operate in full-duplex mode, DCC said.

Datacom Co., a DCC subsidiary, offers a communications service to TNA users that is based on a DCC network with drops in more than 100 cities. Any U.S. business can link the remote terminals of its branch offices to its host CPU by employing this network.

The purchase price of the TNA varies with the configuration ordered, the spokesman said. He noted, however, that typical configurations would range from $40,000 to $50,000.

DCC is at 3000 Directors Row, Memphis, Tenn. 38131.



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Unit Documents Datascope Data

MOORESTOWN, N.J. – Spectron Corp. has introduced a peripheral for its family of Datascope data communications test instruments to monitor data, print hard copy and provide documentation of network data transmissions and test procedures.

Designed to help give thorough network documentation when bringing a new network on-line, or for modifying or troubleshooting an existing system, the D-201 printer/monitor can be used as a peripheral to Spectron's D-500 and 600 series of Datascope monitors.

The D-201 can monitor asynchronous lines at any transmission rate from 50- to 9,600 bit/sec. Used with a compatible Datascope monitor, the D-201 provides hard copy of data originally sent at up to 100K bit/sec using "any" line discipline.

It prints Hex, Ascii, Ebcdic and other codes at up to 900 char./sec. As a stand-alone, hard-copy line monitor, the D-201 provides simplex and half-duplex operation, the firm said.

The printer/monitor costs $4,500 and is available from Spectron Corp. at 344 New Albany Road, Moorestown, N.J. 08057.

Tape Transport Works As Synchronous Unit

SAN DIEGO – Tandberg Data, Inc. has introduced the SCDR 1050 serial communications data recorder, a "compact and nonattended" half-inch synchronous tape transport for use as a data logger and station message detail recorder.

Normally connected to RS-232C communications interfaces, the Tandberg SCDR can be used with the Northern Telecom Ltd. SL-1 computer-controlled, private branch exchange and other "smart switches" as well as any other data-logging applications requiring IBM-compatible half-inch tape format, Tandberg said.

The SCDR 1050 provides 1,600 char./in phase-encoded or 800 char./in NRZI data density at 45 in./sec, according to a spokesman. The unit features sequenced power-fail recovery.

SCDR standard record lengths consist of 2K bytes that are temporarily stored in the RS-232C interface buffer memory. When full, buffer memory contents are written on tape as one industry-compatible standard record, enclosed by interrecord gaps, Tandberg said.

The SCDR interface is a microprocessor-controlled, direct memory access (DMA) device. The microprocessor issues commands and receives status data from both Tandberg's TDF 4050 formatter electronics and the serial communications interface.

An asynchronous communications interface adapter connects serially with the RS-232C or teletypewriter current-loop interface; all electronics are physically mounted in the tape transport chassis, the spokesman noted.

Control Program

The control program resides in read-only memory and input or output data buffers are established in 4K bytes of random-access memory (RAM). Data transfers between interfaces and the RAM are controlled automatically by DMA without processor intervention, Tandberg continued.

The SCDR 1050 is said to provide 5,000 hours mean time before failure, ceramic-blade tape cleaners, single-board electronics and a microprocessor-driven servo system. Compliance-arm tape path geometry is reportedly optimized, minimizing dynamic skew.

The SCDR 1050 costs $8,500, Tandberg said from 3593 Fifth Ave., San Diego, Calif. 92103.

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Model 43's come in a variety of configurations with either 80 column friction feed or 132 column pin feed printers. Some units are designed for use on the switched network, others for point to point private line systems. (There's also a new generation of 5-level buffered teleprinters for Telex applications.)

The basic model 43s can operate on line at 10 or 30 cps in either the half or full duplex mode and print multiple copies using the 94 character ASCII code set. A wide choice of interfaces, including EIA RS 232C and DC 20/60ma are available for easy system integration.

With the automatic send-receive configuration, messages can be prepared off line on the paper tape [illegible] edited, combined with a master tape, then sent at maximum terminal speed—automatically and unattended—when line rates are lowest.

Buffered 43's operate on line at speeds ranging from 10 to 180 cps and provide up to 20,000 characters of storage for sending, receiving and editing. These terminals send and receive automatically via the buffer while messages are simultaneously being prepared for future transmission. They also include full forms control, [illegible] answer capability and answer back.

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But Other Vendors Hustling, Too

Last Year Clearly Belonged to IBM User

By Howard A. Karten
CW Staff

NEWTON, Mass. — If DP users designated years with symbols, the way the Chinese calendar does, 1978 would clearly have been "The Year of the IBM User," as vendors competed vigorously to give customers hardware choices compatible with the de facto software standard established by The Jolly Grey Giant.

Six newcomers to the field of IBM-compatible software suppliers joined the two old-timers, Itel Corp. and Amdahl Corp. — themselves only young whippersnappers — as the latter two firms also broadened their product lines, again increasing the capacity of their largest systems. The additional measure of choice for users seemed to put them in the position of children in old-fashioned candy stores wondering which goodies to buy.

Review & Forecast

The newcomers are Two Pi Co., Magnuson Systems Corp., National Semiconductor Corp., Nanodata Corp., Cambridge Memories, Inc. and Citel, Inc.

This pattern was also reflected in plug-compatible memory, as more vendors not only offered such memory products but in prices and sizes not available from IBM.

The year's three major announcements in disk drives — again, aimed at wresting revenues from IBM — not only provided users with new alternatives but may be the prelude to a long-expected disk product from IBM.

And, adding more fuel to the fire, IBM's two major fourth-quarter announcements — price cuts on two major disk drives and on Mosfet memory — seemed sure to heat up the action for 1979.

IBM itself brought out only two major products during the year — the 8100 distributed processing system and the smaller System/38 — and enhanced memory on the 3033, but the unseen hand of the company was nevertheless present in virtually every major hardware development.

And the company's Christmas present to users — significant reductions in prices on Mosfet memory and the ability to double the maximum memory on the 3033 — should go far towards stimulating business and possibly reducing the impact of a predicted recession for 1979. The move was interpreted by some observers as IBM's attempt to stem the tide of growing business losses to the inde-

(Continued on Page 34)

Business DP Seen Adaptable To Tribal Mode of Operation

By Howard A. Karten
CW Staff

SANTA CLARA, Calif. — Business DP could be run the way Indian nations ran their tribes, according to Dr. Jared A. Anderson, president of Two Pi Co. here.

Each chief ran his tribe by himself, but conferred with other chiefs on matters that affected all tribes or that were too big for him alone.

Like Indian tribal matters, DP problems could best be solved by giving each user department as much control as possible over its own DP needs but retaining a "council" — or mainframe — for the problems that impact all user departments or are too big for any one group of users to tackle.

This decentralized approach is common in business as well, where, for example, a division manager often has complete (i.e., profit and loss) responsibility for his division, Anderson indicated. And it will be increasingly reflected in the DP setup businesses choose, as the steadily decreasing cost of DP hardware enables each division or user of DP services to have its own, on-site hardware, he added.

"The chief appeal of distributed DP [DDP] is that operating groups are freed from dependence on the large, centralized CPU, which is considered a bottleneck and a constraint in the various business groups," he noted.

But, is it necessary to place hardware at individual sites? Anderson was asked. Why not use a high-speed communications setup in which a department uses high-speed input and output devices linked by communications lines to a centralized processor? Wouldn't this provide the same benefits as DDP without the extra hardware cost?

"That's not what is meant by DDP," he replied. "[The concept outlined above] doesn't distribute the intelligence of the mainframe out into the local departments. The idea is to let local departments do the things they can, and let the data be processed locally as much as possible. The mainframe could be used for data base updates, for example, if the

(Continued on Page 38)

Bits & Pieces

Chaintrain Line Gains 600 Line/Min Printer

MALDEN, Mass. — Data Printer Corp. has announced an addition to its Chaintrain series of printers, the 600 line/min Model 1260.

Featuring motorized upper and lower tractor positioning, complete microprocessor control and plug-to-plug compatibility with all Data Printer models, the unit prints up to 132 char./line at 10 char./in. spacing, the company said.

Available with a Gothic or Courier type face, the unit prints six-part forms ranging from 3.5- to 19.5 in. wide, according to a spokesman. Six line/in. spacing is used, with a paper slew rate of 20 in./sec.

The buffer on the unit can hold a line of print, the company claimed, adding that an electronic vertical forms unit is available as an option.

A 64-char. set is standard, with optional 48-, 96- and 128-char. sets available. The printer ranges in price from $10,700 to $12,000 depending on options, the spokesman said from 99 Middlesex St., Malden, Mass. 02148.

Dema Sets Meeting Schedule

GREENWICH, Conn. — The Data Entry Management Association (Dema) has announced its 1979 regional meeting and seminar schedule.

The first meeting of the year is set for the Boston area Jan. 15-17 at the Hyatt Regency Hotel in Cambridge. Two seminars will be presented at that meeting — one on managerial techniques for first-line supervisors and the other on concepts and techniques of information systems, aimed at broadening the perspectives of the data entry manager.

Other meetings are set for Atlanta in February, Chicago in April, Denver in May, and San Francisco in November. Dema can be reached at 16E Weavers Hill, Greenwich, Conn. 06830.

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Year Saw Vendors Vying to Serve IBM Users

(Continued from Page 33)

pendents.

Among the disk drive announcements was a device incorporating two firsts — the first major use of charge-coupled devices (CCDs) in a product aimed at mainframe users and the first solid-state disk, a replacement for the venerable IBM 2305 drum.

Storage Technology Corp. (STC) followed its announcement of a nonrevolving (though nonetheless revolutionary) solid-state disk [CW, Sept. 25] with another first — a quadruple-capacity, 3350-compatible disk that doubled the previously available information packing density [CW, Dec. 4]. It was joined in this by Control Data Corp.'s announcement of a product that gave users a similar increased density, but without the doubling achieved by STC.

These developments, coupled with IBM's reduction in disk prices [CW, Nov. 13] fueled speculation — already at a high pitch — about IBM's long-awaited "Whitney" disk project. Although several sources have predicted that the Whitney project also involves a quadrupling of capacity over current systems, few IBM watchers were willing to commit themselves on the exact nature of the project.

Joining the list of IBM competitors with major mainframe announcements were Honeywell, Inc. and NCR Corp., both of which brought out equipment with capacities comparable to the 30 series. Honeywell's Level 66/DPS, introduced early in the year [CW, Feb. 6], was the only high-powered machine specifically aimed at taking advantage of the excitement surrounding this year's most prevalent DP buzzphrase, "distributed processing."

Honeywell said the five models in the series provide power roughly overlapping that of the three models in the 30 series.

NCR's V-8650 and V-8670, also claiming power comparable to the 30 series, were that firm's first venture into high-powered CPUs. The Dayton firm also increased the maximum power of its N-8300 series with the N-8370.

Univac also joined the high-powered game, bringing out two systems: the 90/80-4, said to exceed the power of an IBM 3031 [CW, May 22], and the smaller 90/40 [CW, May 1].

National CSS, Inc. and Two Pi, Inc. unveiled their 3200 system in April [CW, April 17], the first of six minicomputers designed to use IBM software and compete at the low-to-medium end of the IBM 370 line. They were followed by National Semiconductor's announcement of the S/400 [CW, May 8], and Magnuson Systems Corp.'s M80 [CW, May 22].

Then came Cambridge Memories with the Model 1600 and Nanodata's announcement [CW, Oct. 16] of a minicomputer that could emulate several different systems simultaneously. Citel, Inc., also introduced a 370-compatible mini [CW, Oct. 23], although the company's end-user marketing plans were vague when the Citel 30 series, models 3 and 4, were announced.

Add-Ons

Add-on memory was also an active area this year, with several firms bringing out memory for the 370 line as well as the 30 series. Memorex announced an add-on memory for the 370/168 [CW, Feb. 20] and was followed by Cambridge Memories with add-on memory for the 30 series [CW, May 1]. Four firms — Electronic Memories & Magnetics Corp., National Semiconductor Corp., Memorex and Intel Corp. — displayed new add-ons at June's National Computer Conference, adding to the array of choices.

The plug-compatible mainframers, too, were busy, with Itel adding two systems to the lower end of its line [CW, Sept. 11] as well as a top-of-the-line model — the AS/6 Model 2 [CW, Nov. 6]. That system is faster than IBM's 3032, the firm claimed.

Amdahl's response in this "my old man can lick your old man" race was its 470V/8 [CW, Oct. 23], which again extended the top performance range of the company's products. Figures worked out by *Computerworld* indicate the system is 1.5 times as powerful as IBM's 3033, which would make it the single most powerful (uniprocessor) system yet introduced in the U.S.

The award for "most computer power offered commercially by any mainframe vendor" clearly goes to IBM for its introduction of a multiprocessor (MP)- configured 3033. Although not necessarily a bargain for users [CW, April 4], the MP configuration can process instructions 1.6 to 1.8 times faster than a uniprocessor 3033, IBM claimed.

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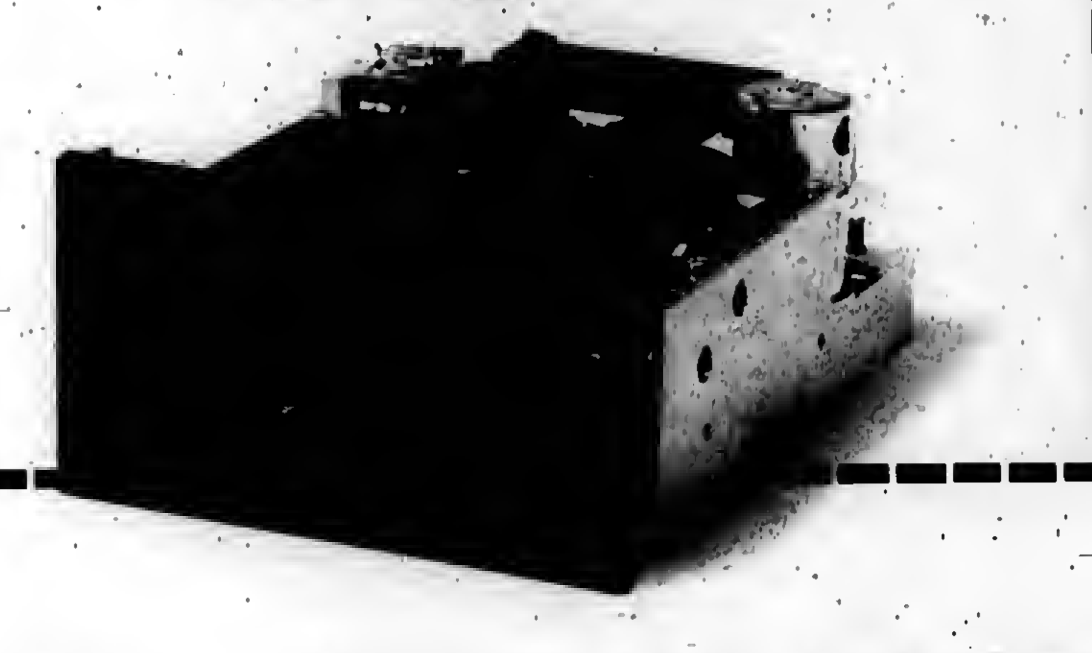

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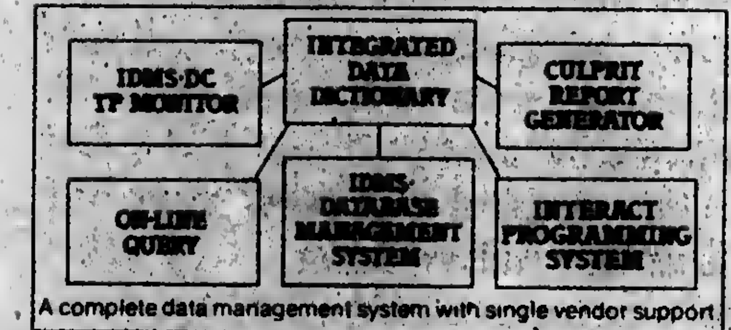
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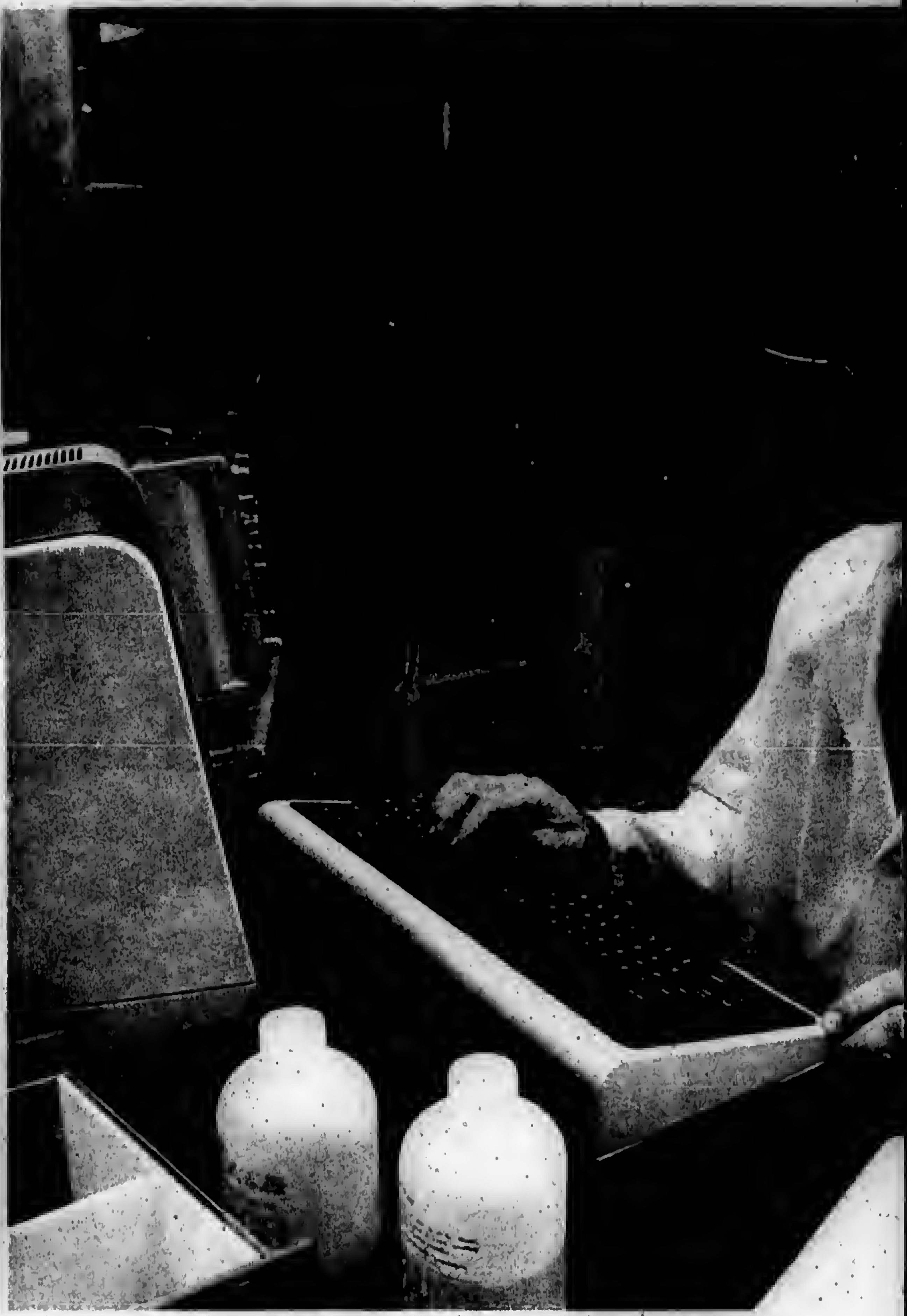

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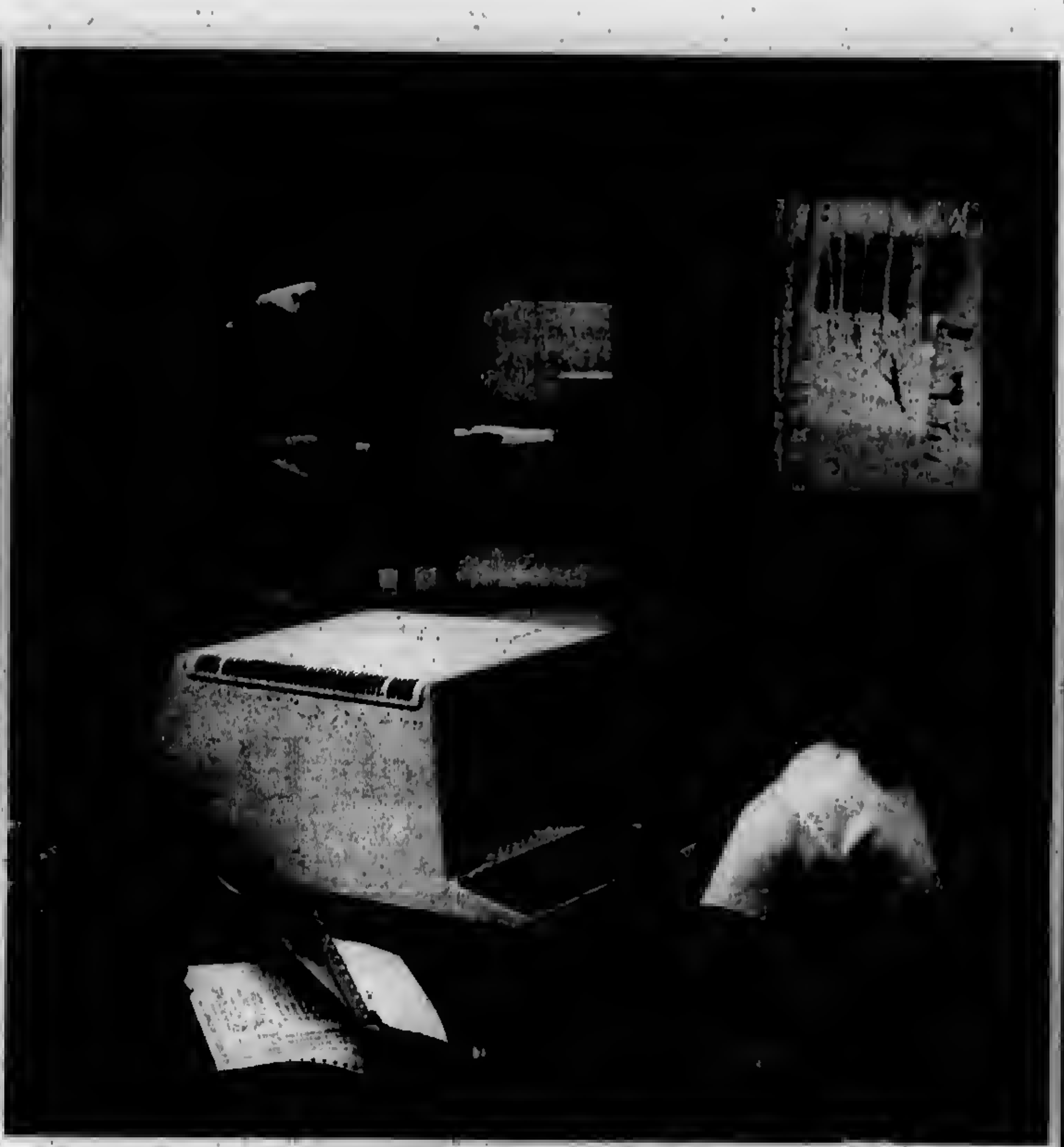

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IRS OKs Use of Microfilm in Place of Paper

TORRANCE, Calif. – The Internal Revenue Service (IRS) is letting companies – at least those that have converted their records to microfilm and microfiche – burn their financial books behind them.

"Federal and state laws have recognized the value of micrographics," David S. Shanks, president of Computer Micrographics, Inc., said, "by allowing microfilmed records to be legal substitutes for original, paper-based records."

Micrographics is the technology of reducing all forms of business data to microfiche, a postcard-size piece of film and other types of microfilm.

Twenty years ago, Congress enacted the "Uniform Photographic Copies of Business in Evidence Act" (Section 1732 of Public Law 129). Subsequently, every state but Louisiana adopted similar legislation while the IRS, under Revenue Rule 76-265, ruled that the "microfilm (including microfiche) reproduction of general books of account will be considered books and records . . ." in case of audit.

"However, in discussions between micrographics industry sources and the IRS, it was determined that the original IRS procedure generated more questions than it answered," Shanks explained.

"Some months ago," he continued, "the IRS issued its final ruling on the subject, Revenue Procedure 76-43, which established specific conditions and standards that must be met in order to obtain permission to retain records solely on microfilm."

Now, whether they are financial records used for an Internal Revenue Service audit or as legal evidence in a court case, microfilmed documents are acceptable in 49 out of the 50 states, Shanks pointed out.

"As companies expand and produce more and more information in today's environment," he said, "so the legal requirements to retain that data increase. Micrographics has become a practical alternative to paper."

In addition to meeting the requirements set forth by the IRS, federal laws and users themselves, the microfilming of records has immediate and tangible advantages for a company, the executive pointed out.

"By sanctioning the transfer of data from paper to film, federal and state governments and the IRS are, in effect, encouraging companies to do what micrographics has done for so many years, – eliminating – the paper monster in today's business community," Shanks concluded.

Tribal Approach Described

(Continued from Page 33)

necessary calculations can be performed locally.

"While low-cost terminals and computers have proliferated, there is growing evidence of disappointment and confusion resulting from the dispersed DP concept," Anderson noted. "The trade and business press repeatedly run stories of caution and explore widespread difficulties in integrating the dispersed sites and finding software that works. Only a handful of large companies have even attempted a comprehensive implementation of the distributed processing concept," the company president stated.

Spread of DDP

One of the factors that will strongly contribute to the spread of DDP is the broad knowledge and use of IBM 370 software, according to Anderson. Both the 370 instruction set and finished 370 software have, in effect, become a standard that will be around for a long time, he indicated, adding, "The 370 instruction set has been so firmly implanted in DP today that it is not presently conceivable that anyone would throw out the estimated $200 billion that exists in software."

Therefore, while languages and computer communication may well change radically – as Charles Lecht and others have predicted – language processors will still be required for this task. "There will still be lots and lots and lots of 370 programs running on machines that are 370-compatible," Anderson said.

To support this contention, he pointed to what he called "tons and tons" of companies that are getting good results with programs that were written for 1401s. "They've never been reprogrammed, never been recoded and they work just fine."

Two Pi stands to gain considerably if Anderson's predictions come true: The company, a part of the Netherlands-based Philips company, manufactures the V32 370-compatible mini introduced recently [CW, April 17].

Anderson's vision of the future of DDP is a 370-compatible network. "Each one of the distributed users will be able to write his own programs, do whatever he wants, run his own business – and the centralized mainframe will be like the council, where the results will be reported, audits will be performed and so on. What makes it nice is that everyone [will be] working in the same language. In the past, this was just too expensive.

"Also, it's easier [now] to find someone who is familiar with the user's problems and knowledgeable in 370 concepts than is knowledgeable with minicomputers," he said.

Cool, clean information.

Shasta Beverages, one of the country's largest soft drink distributors, has learned that "clean" is just as important in processing data as it is in canning soft drinks. That's why Shasta uses Series 21 distributed processing systems from Mohawk Data Sciences in each of its twenty-one plants.

Sales, inventory, and accounting information is entered and validated at the source — before it is transmitted to the central computer. Clean data is processed faster, and that means tighter control and lower costs.

For nearly 15 years MDS has been developing, manufacturing, marketing, and supporting information handling systems for such applications as order entry, invoicing, sales analysis, accounting, and inventory management.

The new MDS Series 21 is a major advance in data entry, data communications, and distributed processing. With MDS, the information you need is processed and transmitted where you want it, when you want it.

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As '78 Products Show

Vendor Interest in Business DP Grows

By Jeffry Beeler
CW Staff

This year's activity in the minicomputer sector reflected a growing vendor concern for the problems and needs peculiar to business system users, especially inexperienced ones.

Although technological innovations continued to play an important role in minicomputer developments, vendors became increasingly aware that results mean far more to business DPers than a machine's internal workings.

As a result, product philosophies in many companies shifted perceptibly. "Human engineering" became a stock phrase in product pitches, and more than one manufacturer touted its wares not as minicomputers, but as "solutions to user problems."

Vendors that had previously confined their design efforts to technical matters like increased bit densities and reduced cycle times now turned their attention increasingly to more "human" considerations like packaging and convenience features. Minis became easier to use and program, more visually appealing and more responsive to changing user needs than ever before.

In short, they became less of a specialty item and more of a general-purpose one, aimed squarely at nontechnical buyers.

At the same time, minis shed some of the mystique that has often made them seem remote, intimidating and unapproachable to business and lay personnel. Digital Equipment Corp. may have done more to "humanize" small business systems than any other vendor when it offered its low-end Decsystem 150 with a series of optional silkscreen prints that reputedly harmonize with most office decor.

In their attempt to adapt computers to a relatively new class of technically unsophisticated customers, vendors addressed some issues close to the heart of business DPers everywhere. "Compatibility" became the latest industry buzzword as manufacturers scrambled to exploit what they perceived as the chief weakness in IBM's small systems line: inadequate upgradability.

Review & Forecast

Not surprisingly, vendors attacked the problem of product-line compatibility from different angles. Honeywell, Inc. designed its Level 6 minicomputer family so users can literally transform each member of the line into any other member simply by adding or removing processor, memory I/O boards.

Data General Corp., by contrast, stressed software compatibility rather than hardware compatibility when it added the low-end CS/20 and the high-end CS/60 to its CS/40 small systems series. Because the CS/20 and CS/60 use different processors — the Micronova and Eclipse S/130, respectively — DG users can upgrade their hardware less

(Continued on Page 47)

Three CPU Additions Broaden DG's Nova Performance Range

By Jeffry Beeler
CW Staff

WESTBORO, Mass. — Improved reliability, increased computing speed and a broadened range of configuration options were reportedly added recently to the Data General Corp. Nova line when DG expanded that minicomputer series with three additional single-board processors.

Christened the models 4/C, 4/S and 4/X, the processors broadened the Nova family's performance range at both the high and low ends, according to a DG spokesman. Although the 4/X corresponds roughly to the Nova 3/ — the family's previous high-end member — the more recent system executes instructions 50% faster and costs 20% less than its nearest relative, he said.

The 4/S corresponds roughly to the middle-of-the-line Nova 3/12, but provides 50% more computing power and costs 10% less than its older counterpart. The 4/C, meanwhile, offers 20% less performance but sells for 60% less than the line's previous low-end system, the Nova 3/4, the spokesman explained.

Data General's Nova 4/X, one of three recent additions to the Nova line, packs a CPU on one board and provides up to 15 chassis slots for memory I/O.

Although DG reportedly plans to continue selling its three Nova 3 family members, they will be effectively replaced by the Nova 4 systems, he added.

All three members of the Nova 4 series come with a choice of a five-slot or a 16-slot CPU chassis. The five-slot version of both the high-end 4/X and the mid-range 4/S reserves one slot for a processor board, an-

(Continued on Page 40)

Level 6 Memories Decline in Price

WALTHAM, Mass. — Honeywell, Inc. has cut by 15% to 49% the price of 16K-bit memory chips for its Level 6 minicomputers.

With the reductions, the price of a high-density Level 6 controller with a 64K-byte parity memory has fallen from $8,400 to $4,700. The price of an additional 64K-byte parity memory pack has dropped from $4,400 to $2,250, according to a Honeywell spokesman.

A controller with a 64K-byte error detecting and correcting (Edac) memory now costs $7,600 compared with $9,600 previously, while the cost of an additional 64K-byte Edac memory pack has declined from $5,000 to $3,800.

System Helps Save 'Dough' For Rising Bagel Baker

By Marguerite Zientara
CW Staff

W. HAVEN, Conn. — Even though its sales have jumped 45% during the last two years, a bakery here has cut its annual payroll by $4,700, and the company's managers attribute the savings primarily to their in-house minicomputer system.

Lender's Bagel Bakery, established in 1927, has experienced a sudden sales boom now that its main product, once considered an ethnic food, is growing rapidly in popularity. The company employs more than 200 individuals at three locations in New York and Connecticut.

Company Controller Al Shaiken credits his firm's payroll savings to "increased efficiency" brought about by the minicomputer system. "It was real drudge to record business statistics manually," he explained, "and now the information is more timely."

Before 1972, the firm used an outside computer service for accounts receivable and payroll functions and did many routine office functions manually.

"When we decided to purchase our own computer, we looked at a lot of systems, including equipment from IBM, Univac, Basic Four Corp. and Burroughs Corp.," Shaiken recalled. "We found at that time that the Basic Four system was the only truly on-line, fully integrated system. The others were either for batch processing or a mixture."

Bagel Business Rises

In 1972, then, the company bought a Basic Four Model 400, but the recent sharp increase in business dictated a need for faster throughput. So last August Lender's replaced the Model 400 with a Basic Four System 610.

Under its earlier DP systems, Lender's sent all its business and accounting data out of house to the service bureau. "There was a seven-day waiting period for payroll, and our accounting functions were at the mercy of a number of elements, including snowstorms," Shaiken noted. "Now, with the in-house system, we are in greater control. There's no lag in billing time and when we need information, we simply call it up on the computer's CRT terminal."

Lender's uses its mini for various applications including accounts receivable and payable, food brokers' commission statements and perpetual inventory. It also uses the system for specialty programs like recording maintenance and depreciation costs for various pieces of machinery and for generating sales analysis reports by product, territory and customer.

(Continued on Page 47)

Line Triples Printer Distance

SAN DIEGO — Users of Datasystems Corp.'s DLP-11 line printer controller can operate their printers more than three times farther away from their CPUs than before now that the company has introduced an optional long-line interface for the controller.

Compatible with Dataproducts Corp. printers, the external interface allows similar printers to operate more than 50 feet away from any Digital Equipment Corp. PDP-11 series minicomputer.

The DLP-11 long line option costs $200 and is available from Datasystems at 8716 Production Ave., San Diego, Calif. 92121.

DG Broadens Nova Line With Three CPUs

(Continued from Page 39)

other for main memory and the remaining three spaces for I/O boards.

With the 4/C, the five-slot chassis provides one slot for CPU and memory, which fit on the same board, and accommodates up to four I/O cards, The Nova 3/4, by contrast, accepts only one I/O board.

In the 16-slot version, both the 4/X and 4/S allocate one rack space for a CPU module and 10 spaces exclusively for I/O boards. Another slot accepts either a memory module or an optional floating-point unit, and the remaining four spaces hold either memory or I/O controllers.

The Nova 3/D, on the other hand, provides a total of only 12 board slots, including six for I/O.

With the 4/C, the 16-slot option reserves one space for a CPU board and the other 15 slots for I/O controllers.

Reliability Features

All three Nova 4 systems also offer assorted reliability and maintenance features not available with the Nova 3 line, the spokesman explained. Some of these features include internal diagnostics for CPU and memory, an off-line switching power supply, reduced interconnections and an optional battery backup unit that supports a full main memory complement for up to 90 minutes.

Moreover, the five-slot chassis versions of each model incorporate two 4.5-in. cooling fans, compared with four such units in the 16-slot chassis systems.

Other features shared by all three members of the Nova 4 line reportedly include an asynchronous terminal interface, automatic program load, optional hardware multiply/divide, hardware stack and frame pointer, direct memory access channel and 16-level priority interrupt structure.

Unlike the other two Nova 4 models, however, the 4/X incorporates a memory management and protection unit (MMPU) that permits users to address 32K to 256K bytes of main memory with four address extension tables including two program maps and two data channel maps, the source said.

Without the MMPU, the 4/C incorporates 16K to 64K bytes, while the 4/S expands from 32K to 64K bytes.

Both the 4/X and 4/S also provide a prefetch processor — a feature absent in the 4/C system. While the two largest Nova 4 CPUs are executing current instructions, the prefetch processor loads upcoming instructions at 20M byte/sec in a first-in/first-out (Fifo) buffer memory, the spokesman explained.

As a result, the 4/X and 4/S can typically execute a STORE instruction in 400 nsec and an ADD instruction in 200 nsec.

Performance Edge

The 4/C belongs in roughly the same product class as the Digital Equipment Corp. PDP-11/03 and 11/04, but provides an unspecified edge in price/performance, the source claimed. The 4/S and 4/X, by contrast, compare most closely to the PDP-11/34 and, like the 4/C, reportedly outperform their DEC counterpart by an unquantified amount.

DG partly attributes the Nova 4's performance edge over the DEC models and the Nova 3 line to four-way memory interleaving, which cuts typical memory cycle times to 400 nsec. Company officials also credit the performance improvement to a 56-bit-wide microword and to the optional floating-point feature, which is available only with the 4/S and 4/X.

Using the enhanced floating-point unit, the two largest Nova 4s can execute a double-precision STORE in 200 nsec and a double-precision ADD in 1.6 microsec, the spokesman said.

In a five-slot version, a 64K-byte Nova 4/C with an asynchronous interface, automatic program load and power fail/auto restart costs $3,500. A 16-slot, 64K-byte Nova 4/S with similar features sells for $7,600, and a 256K-byte 4/X with a floating-point processor, 16 chassis slots, 20M-byte disk unit, four Dasher 6053 CRT terminals and a 180 char./sec Dasher LP2 printer costs $56,886.

Deliveries of the 4/C begin in 180 days, compared with 90 days for the 4/S and 4/X. Data General is located at Rt. 9, Westboro, Mass. 01581.

EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer — the Burroughs B1700 — with card input sequential files and no video displays, we suffered long delays and storage constraints:

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds — all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational, on-site on February 15, with 61 programs written, debugged and tested — all by only two people — and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software.

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

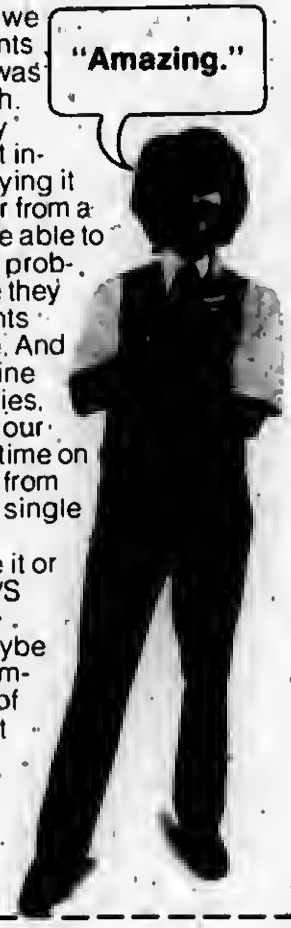
J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system, Not only did I do it: Thanks to the programming power of the VS, I actually came up with more.

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."



EDP professionals in more than 100 companies are singing the praises of the Wang VS And for good reason

The VS is a remarkably sophisticated fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment

The VS provides for distributed data processing, thus avoiding costly consumption of mainframe resources. It's fast, responsive, ease to use and can support up to 2.3 billion bytes of on-line storage. What's more the VS speaks EDP people's language: COBOL, BASIC, RPG II and ASSEMBLER.

We also think you'll appreciate how simple the VS is to operate. In fact, because of its level of sophistication, it can be operated by people with little or no computer-related training or experience.

One more thing: the entry level price of the VS is under $50,000. Which is. perhaps the most remarkable thing of all about this computer.

For more information on the VS, return this coupon to Wang Laboratories, Lowell, MA 01851.

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The PDT-11 line starts with three configurations: basic intelligent terminal, intelligent terminal plus tape storage, and intelligent terminal plus disk storage. Mix and match according to your needs.

Hard-copy options include our new compact 300-baud table-top terminal (the LA34) and our new 1200-baud terminal (the LA 120)—ideal for high-performance communications needs. Both are from the same line as our industry-leading DECwriter II's.

For video display, we offer the new VT 100 terminal—with a combination of features no other video terminal can match: 132 column screen, detachable keyboard, split screen, reverse screen (white characters on black or vice versa), smooth scrolling, adjustable screen brightness, and line drawing capabilities.

But the PDT-11's mean a lot more than sophisticated local intelligence. They also open the way to a whole line of upward compatible computer products—right up through the PDP-11 computers to the new 32-bit VAX-11/780.

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And remember, that one vendor is the world's leading manufacturer of minicomputers, with support and service second to none.

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The PDT-11/110. Basic intelligence. The PDT-11/110 combines video display terminal, processor, and up to 60,000 bytes of random access memory. It stores all local programs related to data capture—including formating, error checking, operator messages, and editing.

The PDT-11/130. Intelligence plus tape storage. When your need is for data capture with local storage capacity, the PDT-11/130 is an economical solution. It's a video system with processor, memory, and a dual minicartridge tape that stores up to 512,000 bytes of data.

The PDT-11/150. Intelligence plus disk storage. Our PDT-11/150 includes processor, memory, and single or dual floppy disk drive—with your choice of hard-copy or video display for your console.

The PDT-11 systems are available with all the software you need to generate your applications

Now Digital's leadership in both terminals and computers brings single-vendor convenience to network information systems.

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The PDT-11 systems are available with all the software you need to generate your applications in BASIC, FORTRAN, or MACRO. We also offer a forms package to help you format your video screen quickly.

The PDT-11 Cluster Concept. The hardware and software power built into the PDT-11 family gives you more flexibility than ever before in assembling remote workstations.

PDT-11 terminals are available with four plug-in ports, and you can select your peripherals either from within the PDT-11 family or from our line of hard-copy terminals.

For example, you might combine a basic PDT-11/110 with a Digital DECwriter printing terminal. While the printer produces hard copies for your permanent files, the display terminal can be used at full capacity for other operations.

If your application calls for multiple terminals, you can cluster up to three additional terminals around the PDT-11/110. Each terminal shares the intelligent terminal's processing power, and each acts as an efficient communications link to the host.

Clustering with our PDT-11/150 terminal is one of the most inexpensive ways to create multiple intelligent workstations. For instance, a PDT-11/150 with three VT100 terminals gives you four-way intelligence at an incredibly low cost. Less than $3000 per terminal.

Naturally, you can interchange units and expand your clusters as your requirements change. PDT-11 clustering power takes terminal intelligence wherever you need to go.

PDT-11 compatibility: Software protection. Easy migration. Because the PDT-11's use the basic PDP-11 instruction set, they not only protect your PDP-11 software investment, they let you move up through our full line of PDP-11 minis and medium-scale computers.

In short, the PDT-11's represent the first complete integration of terminal and computer technologies.

Just what you need to make your network operations more efficient.

And just what you'd expect from Digital.

For more information on the PDT-11 family, write on your letterhead to: Digital Equipment Corporation, One Iron Way, Marlborough, MA 01752.

The PDT-11's. State-of-the-art intelligent terminals with PDP-11 power.

PDT-11/110

- VT100 Based
- PDP-11 Compatible Processor
- 16Kb, 32Kb, 60Kb RAM Memory
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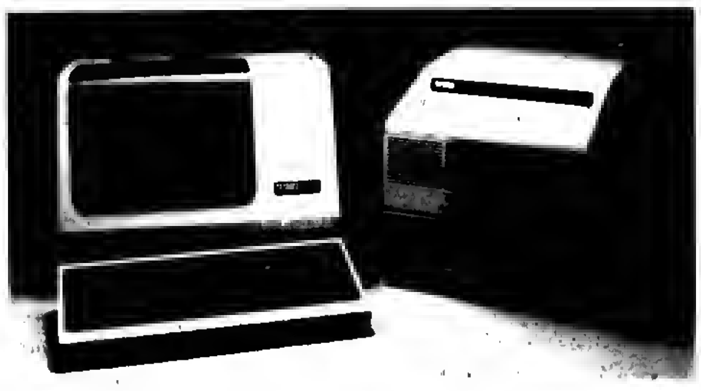
- Asynchronous/Synchronous Communications Port
- Optional Controller for up to 3 Additional Clustered Terminals
- Self-Test Diagnostics

PDT-11/130

- VT100 Based
- PDP-11 Compatible Processor
- 16Kb, 32Kb, 60Kb RAM Memory
- EIA Port for Local Printer
- Asynchronous/Synchronous Communications Port
- 512Kb Dual Tape Cartridge (Block Addressable)
- Self-Test Diagnostics

PDT-11/150



- Hard-copy or Video Console Terminal
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- Optional Controller for up to 3 Additional Clustered Terminals
- Self-Test Diagnostics

Cluster Terminals

VT100

- User Selectable 80/132 Column on 12" Screen
- Detached Keyboard with Numeric Keypad
- Screen Attributes: Split screen, smooth scrolling, reverse screen
- Character Attributes: Normal, double-width, double-size characters, underline or reverse (standard)
  Optional: Bold and blinking characters
- Editing Features Available

LA34 DECwriter IV

- 30cps Keyboard Printer
- Tractor Feed for Multi-part Forms Available
- Table-Top
- 4 Selectable Character Sizes

LA120 DECwriter III

- 180cps (max.) Keyboard Terminal Printer
- Forms Capability
- Numeric Keypad Available
- 8 Selectable Character Sizes

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Vendor Interest in Business DP Up

(Continued from Page 39)

easily than their Honeywell counterparts.

But DG partly offset this weakness by providing its business systems line with a common programming language — Ansi '74 Cobol — which allows users to transfer programs from one CS model to any other without recompiling.

Wang Laboratories, Inc. combined elements of both DG's and Honeywell's compatibility strategies when it expanded its small systems family with the WCS/50. Like the CS series, the WCS systems use a common programming language. But like the Level 6 equipment, the low-end WCS/50 upgrades to larger members of its family merely by accepting additional memory and I/O processors.

Hewlett-Packard Co. skirted the question of hardware and software compatibility when it introduced a small business systems family that uses multiple CPUs and operating systems. Like some of its competitors, however, HP recognized the need for a broad range of commercial offerings for business users.

Only a few months after introducing the low-end Model 250 and the high-end 3000 Series III, HP bridged the gap in its product line with two mid-range offerings — the Model 300 and the 3000 Series 33.

IBM, meanwhile, reinforced its dominance in the business computer sector when it announced major additions to its small systems line as well as enhancements to its existing offerings.

The industry giant opened the year with the introduction of its 5110 desktop computer, a disk-based version of the company's older and less powerful 5100, which uses magnetic tape as its mass storage medium.

A few months later came the announcement of the System/38, which provides an upgrade path for System/3 and System/34 users and which sports a raft of technological innovations, including RPG-III, compressed logic densities and 32K-bit memory chips.

In addition, IBM used the past 12 months to improve the networking capabilities of its small business systems line. First, the company enhanced its Series/1 with Cobol and a "communications attachment feature" that allows the system to link to 370 series and Series 30 processors. Then the firm announced enhancements that allow the System/34 to operate in a Systems Network Architecture environment.

Finally, the company introduced its Model 8100, which sports 64K-bit memory chips, offers unbundled system software and operates in 370-based distributed processing networks.

But while technology at IBM and elsewhere advanced at an unprecedented pace, some old and familiar bugaboos continued to defy solution. For many vendors, especially the fastest growing ones, service remained a major source of user complaints.

In general, mini vendors enjoyed much more success when faced with technological hurdles than when trying to tackle computing's more elusive human problems.

Board Bows

ORANGE, Calif. — Ninety-one 14- or 16-pin integrated circuit or socket positions can reportedly be accommodated by MDB Systems, Inc.'s wire-wrap half-board for Interdata, Inc. minicomputers.

Mechanically identical to its Interdata counterpart, the general-purpose board also provides .4-, .5- or .6-in. centers that accept circuits or discrete components with more than 16 pins.

The 7- by 15-in. half-board, which mounts in one Interdata CPU chassis slot, accepts almost any combination of sockets or integrated circuits with 14 to 60 pins.

The half-board costs $275, from MDB at 1995 N. Batavia St., Orange, Calif. 92665.

System Saves For Bagel Baker

(Continued from Page 39)

With the acquisition of the System 610, Lender's is automating additional applications, including weekly bagel sales reports for salesmen and a labor-vs.-production-cost report for management. "We're working on an inventory of ingredients control, which is a more complex report," Shaiken noted. "This will give us an idea of how effective our formulas are for producing bagels."

Lender's System 610 consists of four CRT terminals, a 72K-byte CPU, a 70M-byte disk unit and a 300 line/min printer.

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Take this quick quiz:

(WARNING: there may be more than one right answer to each question)

1. Model 85 is:

(a) a remote information system we first introduced in 1978.

(b) a distributed data processing product.

(c) a multifunction data processing product.

2. Its features include:

(a) multitasking for up to four applications.

(b) large disk capacity.

(c) modular configuration.

(d) more than these.

3. New improvements are:

(a) increased processor memory to 256K bytes.

(b) the addition of remote workstations and printers.

(c) increased disk storage to 100 MB.

4. Model 85 functions are:

(a) remote file management and high level language processing.

(b) on-line file management and stand-alone processing.

(c) batch communications and volume data entry.

5. Available languages are:

(a) RPG II.

(b) COBOL.

(c) ESPERANTO.

6. Model 85 saves users money as an alternative to:

(a) enlarging mainframes overburdened by network interactive applications.

(b) adding communications lines with greater capacities.

(c) maintaining a mainframe configuration only fully used at peak time periods.

(d) losing time and money due to mainframe downtime.

7. For more details on Model 85, you should:

(a) phone your nearest Data 100 sales office or one of the numbers we've listed.

Now check your answers.

All answers but these three are correct.

2a: Model 85 offers multitasking for up to *eight* applications.

3c: 100 MB is old figure; Model 85 is now *245.6 MB* disk storage.

5c: No, Model 85 doesn't speak it. Yet.

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Hobbyists' Glory Fading

Micros for Business to Star Next Year

By Ann Dooley
CW Staff

Two years ago, computer hobbyists were in their glory and the microcomputer market was theirs for the asking. In 1978, however, micro manufacturers began realizing the benefits of serving another master.

It had always been predicted that the personal computer — or hobby — market would peak and then level off to cater to a devoted group of interested hobbyists. While it was still too early in 1978 to know whether that market had peaked, the year did show the industry to be in a state of flux.

Equipment manufacturers began featuring more powerful, business-oriented systems rather than the do-it-yourself micro kits they had been offering to hobbyists who had the time and energy to build them.

Software companies followed suit with general business applications and fewer versions of "Star Wars." Although those companies had never really met all the hobbyists' needs, they accomplished even less in their attempts to provide business users with any kind of reliable, all-around software applications in the past year.

Many observers feel that is the major shortcoming in the micro industry and a situation that will need to improve significantly before micros become a viable product for business users.

Review & Forecast

The fact that the industry's very nature was changing was most obvious at the microcomputer shows. Those shows were once the backbone of the hobby market, where hobbyists would come to play with hundreds of different games and devices, wearing tee shirts and bringing a razzle-dazzle, slightly offbeat element to the shows.

But last year much of the razzle-dazzle was fading, and tee shirts were discarded in favor of three-piece suits. There were fewer gimmicks and whistle-blowing exhibits and more promotional literature.

The micro shows themselves seemed to suffer from the changing market. Because of the previous year's successes, a large number of shows were held throughout the country in '78; however, the attendees, for the most part, did not turn out in the same numbers. Attendance was down dramatically at personal computing shows in Dallas, Chicago and Philadelphia.

Different Styles

The problem seemed to be that business people do not shop the same way that hobbyists do. While the hobbyist has a working knowledge of computers and is content to play with a system, talk to the salesperson and make a purchase, the business user wants to know what the system will deliver and doesn't really care how it does so.

In addition, the small business user usually knows very little about computers and cannot learn in the 10 minutes or so an exhibit salesperson can spend with each customer.

The manufacturers also found themselves in a quandary. Since it was not economically feasible for them to appear in all the regional shows, they had to pick and choose, taking the risk of picking the poorly attended ones.

In 1978, business people increasingly seemed to turn to computer retail stores when they were considering buying a computer.

One of the most significant events in 1978 for micros was the opening of a microcomputer retail store in Manchester, N.H., by Digital Equipment Corp., the first such large manufacturer to enter the retail market.

That store will undoubtedly prove to be the forerunner of others in the year ahead. DEC itself plans to open additional stores, and Radio Shack — which firmly held the lion's share of the micro market last year — already has a strong retail network.

The major retail department stores, such as Sears Roebuck and Co., will also divert a large portion of sales from the computer stores when they begin retailing microcomputers. This leaves computer store owners facing a lot more competition as they try to attract prospective buyers, industry observers said.

While the industry last year didn't completely abandon the hobbyists, it is clear the manufacturers will go where the money is — with the business user.

Microsoft Has Fortran Compiler For Radio Shack TRS-80 Users

BELLEVUE, Wash. — A Fortran and Assembly language software package that includes the Microsoft, Inc. Fortran-80 compiler, macro assembler, text editor and linking loader is now available for Radio Shack Corp.'s TRS-80 from Microsoft.

In addition to Fortran capabilities, the package provides the first Assembly language development tools for TRS-80 disk systems, Microsoft claimed.

The editor allows the creation of assembler source files, data files and Fortran files. The Z80 macro assembler has a complete macro facility, full set of conditionals and relocation pseudo-operations.

Fortran-80 includes all Ansi 1966 Fortran except the Complex data type, plus enhancements such as mixed-mode arithmetic, logical operations on integer data, encode/decode for format operations to memory and end-of-file and error condition trappings.

The TRS-80 Fortran package is fully compatible with the micro's disk operating system and is supplied on two minidiskettes. A TRS-80 with a minimum 32K-byte disk system is required. The package costs $350 from Microsoft, Suite 819, 10800 N.E. Eighth, Bellevue, Wash. 98004.

Courses Set in Three Cities

WASHINGTON, D.C. — George Washington University here has planned several short courses in microprocessors aimed at engineers and managers who are currently using or planning to use microprocessors.

The courses are designed to give users a better understanding and appreciation of the microprocessor by examining terminology, concepts and potential applications.

The courses will be held at the Sheraton-Houston Hotel in Houston, Texas, on Jan. 17-19; at George Washington University, Feb. 7-9; and at Biscayne College in Miami, Fla., March 7-9.

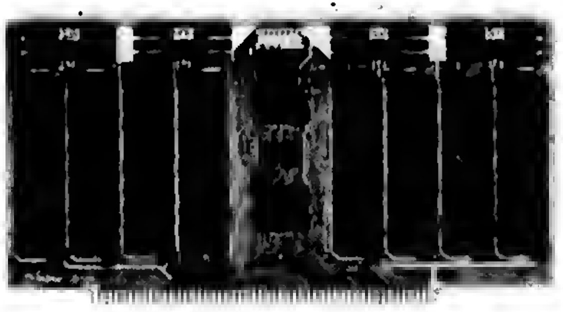
Each course costs $405. Further information is available from the Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052.

S-100 Gets Memory Board

BERKELEY, Calif. — The Superram, a 32K static random-access memory (RAM) board, has been introduced by Thinker Toys as the latest in its line of S-100 memories.

The board uses the National Semiconductor Corp. Model 5357 or the Texas Instruments, Inc. equivalent Model 4044 4K by 1-byte NMOS memory chips. It can be run at 2 MHz for standard 8080 systems or 4 MHz of Z80 systems, the firm said.

All control signals, addresses and data lines are fully buffered, according to a spokesman. Each 16K block is independently addressable and write protected.


Thinker Toys Superram

The board contains seven support integrated circuits and the typical power consumption is 2.6A, he said.

The board was designed to meet the proposed IEEE S-100 standard and will work with any computer meeting thise specifications, Thinker Toys noted. The Superram costs $649 in kit form and $699 assembled from the firm at 1201 10th St., Berkeley, Calif. 94710.

Video Boards Tied With Applications

EUGENE, Ore. — Forethought Products has introduced the 6502 Video Driver Routine (VDR) which provides software support for memory-mapped video boards to allow them to be interfaced to applications programs, assemblers, Basic interpreters and so forth, the firm said.

The VDR manages cursor movement, line and page overflow, scrolling and control functions. Programmable mode control is maintained over the video board so that graphics, Greek and reverse characters can be displayed on boards so equipped.

The 6502 also includes facilities for scrolling speed control, printer control and partitioning of the screen into protected areas, the firm said. The 6502 VDR was designed for S-100 video boards of 16 lines by 64 characters but can be easily adapted to 32-character boards as well, the firm stated. The software is provided on a KIM-compatible cassette tape.

The 6502 VDR costs $950 from local stores or direct from Forethought Products, 87070 Dukhobar Road, Eugene, Ore. 97401.

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The 820 comes with standard equipment that is setting new industry standards: 150 characters-per-second optimized bi-directional printing, adjustable wide carriage, 9 x 7 dot matrix character font, a full 128-character ASCII keyboard, Answerback Memory, a "last character view" mode, self-testing capabilities, a three-digit L.E.D. Terminal Status Control panel, and impact printing at less than 60 decibels. Optional equipment includes compressed character printing, a full ASCII/APL keyboard, and an 18-key numeric cluster.

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'Big Print' For Micros

SAN RAFAEL, Calif. — Users of 8080, Z80 and 8085 microprocessors can now use an applications program called Big Print to print large block characters and create any message on 14-7/8-in. paper.

Upper and lower case letters, numbers and 27 special characters are available.

To use the program, a minimum 12K bytes of random-access memory (RAM) is needed plus Solos Cuter processor technology and a 132-position printer. Object code is distributed on cassette for $29.95 plus 6% sales tax from the Computer Demo Room, Inc., 509-B Francisco Blvd., San Rafael, Calif. 94901.

Line-Oriented Text Editor Aimed at 8080, Z80 Users

BELLEVUE, Wash. — Microsoft, Inc.'s Edit-80, a random-access, line-oriented text editor for 8080 and Z80 systems, is the first microcomputer editor with random line access to floppy disk files, according to the firm.

The editor reportedly provides almost instantaneous access to any record of a file, even if the available memory space is considerably smaller than the file being edited.

The Edit-80 supports a full range of editing commands as well as automatic line renumbering, global find and substitute and multiple page files. Edit 80's Alter Mode provides a complete set of intraline subcommands to edit portions of individual lines.

The Edit-80 text editing package includes a file compare utility program called Filcom, which compares source or binary files and outputs differences between them.

Edit-80 runs on any 8080 or Z80 system with the CP/M operating system and costs $120, Microsoft said from Suite 819, 10800 N.E. Eighth, Bellevue, Wash. 98004.

Betsi Links Pet to Bus

EUGENE, Ore. — Forethought Products is now offering its Betsi interface/motherboard that links Commodore Business Systems, Inc. Pet to an S-100 bus on an off-the-shelf basis.

In kit form, Betsi costs $119 and includes one S-100 connector; it costs $165 assembled and tested with four S-100 connectors.

Forethought Products is at 87070 Dukhobar Road, Eugene, Ore. 97402.

SSM Unwraps Video Board

SANTA CLARA, Calif. — SSM is offering users the VB2, an I/O-controlled video interface board that has its own keyboard input port, eliminating the need for any further I/O boards for either keyboard or video display, the firm said.

The display is in all upper case letters as well as numbers and symbols and is switch-selectable for white-on-black or black-on-white. Character width, horizontal margin and vertical position are adjustable.

The VB2 costs $149.95 in kit form and $189.95 assembled. Further information is available from SSM (formerly Solid State Music) at 2116 Walsh Ave., Santa Clara, Calif. 95050.

Book Evaluates Books on Micros

ANN ARBOR, Mich. — A paperback book, *Getting Started With Microcomputers*, provides an evaluation of 25 books and periodicals on current technology and equipment and recommends each for its usefulness to the programmer, engineer or systems designer.

The free book includes a buyers guide with current prices and capabilities of home computers.

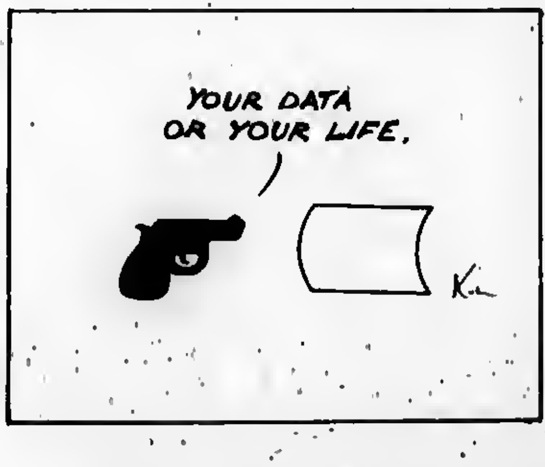
The book is available from NCE/-Compumart, Inc., P.O. Box 8610, Ann Arbor, Mich. 48107.

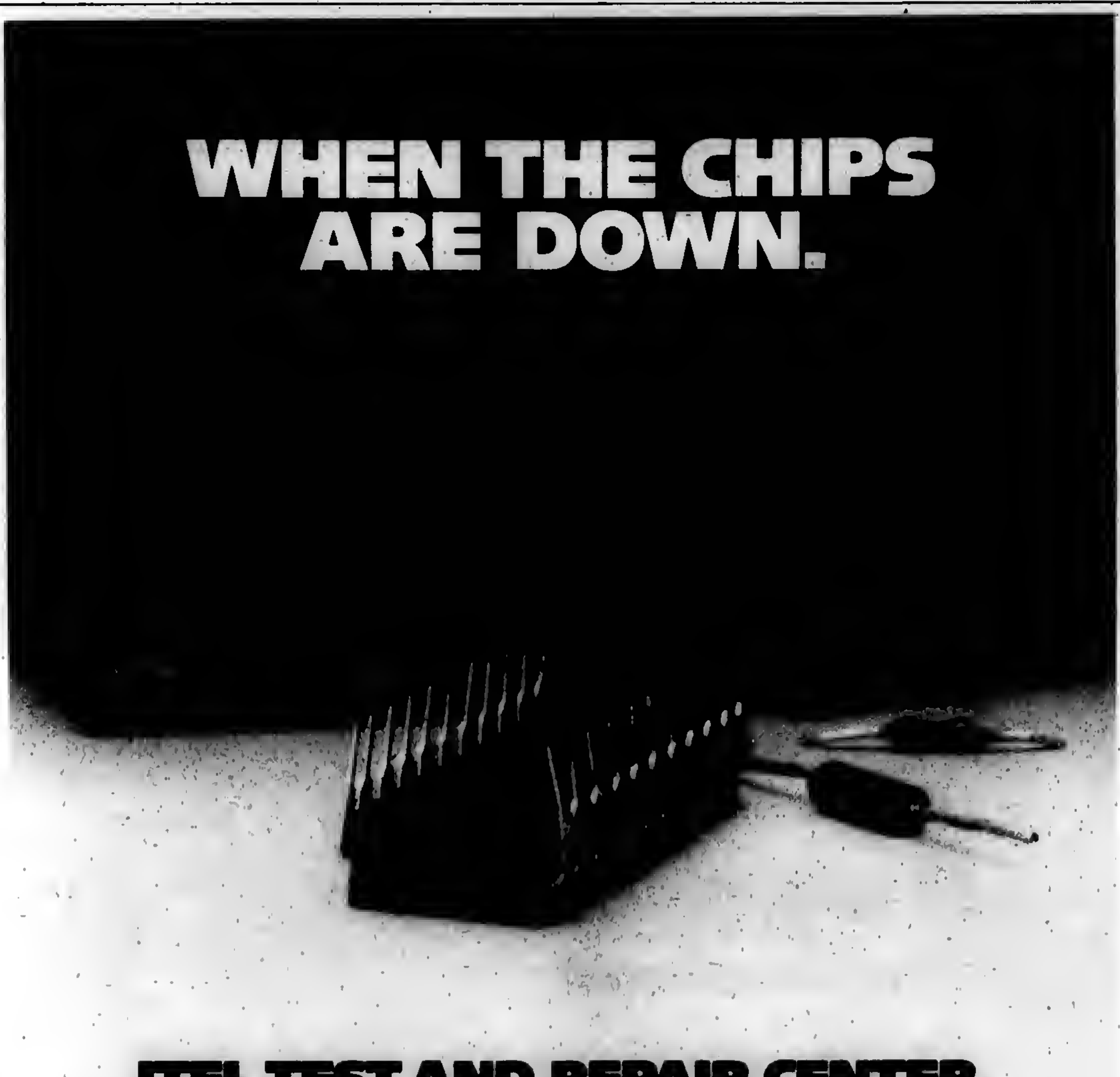
Memory Goes Up to 64K Bytes

WESTLAKE VILLAGE, Calif. — Designed for Intel Corp.'s intellec MDS 800, SBC 80/10, SDK-86 and BLC 80/10 microcomputers, the Chrislin Industries, Inc. CI-8080 memory module features expansion to 32K, 48K or 64K bytes on a single board.

The memory is compatible with both 8-bit and 16-bit Multibus-based systems, the firm said. The unit was designed to plug directly into the memory slot of the MDS 800 and the SBC 80/10.

The 16K-byte by 8-bit unit costs $390; the 64K-byte by 8-bit unit is $890 from Chrislin, 31312 Via Colinas, No. 102, Westlake Village, Calif. 91361.





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CI Notes

National Semi Eyeing French Joint Venture

SANTA CLARA, Calif. — National Semiconductor Corp. and Saint-Gobain-Pont-A-Mousson have agreed in principle to form a joint-venture company in France to manufacture MOS integrated circuits (IC).

The agreement — subject to approval by the boards of both companies — would give National Semi. 49% and Saint-Gobain 51% interest in the firm.

The initial capital outlay for the IC venture will amount to about $16.2 million, National Semi said. The complete project, including working capital, will represent an investment of about $115.2 million over the first five years.

During that period, The French government will subsidize the new company with a long-term loan and an advance to acquire technology from National Semi.

If approval for the venture comes in the first quarter as expected, construction of the IC manufacturing facility will begin in 1979 for start-up before the end of 1980. The exact location in France has not been determined. Plans call for the IC firm to begin with a staff of 200 to 300 employees and increase the work force to about 500 by 1985.

Stockholder's Suit Against CDC Dismissed by Minneapolis Judge

MINNEAPOLIS — A stockholder's suit which sought to order top executives of Control Data Corp. to pay about $1.7 million back to the company was dismissed here by Federal District Judge Edward J. Devitt, who ruled the case was not in CDC's best interest.

The suit, filed by Arthur Abbey, sought to hold high-ranking officials at CDC responsible for the fines and penalties incurred after CDC pleaded guilty last April to charges that it had made illegal foreign payments.

In granting the summary judgement, the judge noted that a special litigation committee set up by CDC's board of trustees to study the matter determined "that this action is not in the best interest of Control Data . . . Given the impeccable credentials of the committee members and the thoroughness of their investigation, it would be impossible to establish bad faith or lack of independence on the part of the committee."

After extensive examination of the issue, incuding lengthy interviews with the seven executives involved, the committee concluded that "none of the seven individuals authorized or had any contemporaneous knowledge of the events which ultimately formed the basis of the criminal charges brought by the U.S. government."

Review & Forecast

Past Year in DP Industry Not Easy to Categorize

By Marcia Blumenthal
CW Staff

Summing up the computer industry over the past year is like trying to squeeze a jumping jack back into its box; the agility of the coils make Jack difficult to fit into a neat package.

Tidy dollars and cents may be the best jumping-off place. Quarterly financial reports heralding record earnings and revenues were generally the rule. Mainframers had banner quarters.

For each of the first three quarters of the year, Amdahl Corp. posted earnings increases of 89% or better. At one time or another during the various quarters, Itel Corp.'s earnings advanced 54%; NCR Corp. boosted earnings by 44%; and Honeywell, Inc. swelled its earnings 49% compared with the year-ago quarters.

Although the financial picture was generally exuberant, some companies began experiencing earnings pinches during the year as prices of products dropped and operating costs escalated.

IBM seemed sluggish for the first two quarters, Earnings increases hovered at 5% or less above 1977 levels. But the behemoth rallied during the third quarter, showing an 18% increase in earnings compared with its 1977 third quarter.

While IBM's posture for the first half of the year seemed quiescent, during the fourth quarter it crackled with an aggressive move into distributed data processing and price cuts of Series 30 add-on memory that inspired speculation among competitors and industry observers.

While most firms were experiencing record years, ominous signs began clouding the economic future during the third quarter. The highs of the stock market in August and September gave way to double-digit interest rates and talk of recession by October. Stock prices began dropping.

Speculation on the state of the economy permeated the industry throughout the fourth quarter. Most companies in the computer industry did not expect a major downturn in the industry, but recession became a serious topic of conversation in executive suites.

Isolated incidents such as Data 100 Corp.'s abandonment of the OEM printer market and Control Data Corp.'s sudden decision not to market its first intelligent terminal, the C-760, caused second guessing about those segments of the market.

Other economic issues of capital formation and investment in R&D continued to be hot topics in industry associations. The passage of the Revenue Act of 1978, aided by the lobbying of various industry groups, reduced the maximum capital gains tax from 49% to 28%. These new taxation rates were expected to be a boon to young high-

(Continued on Page 56)

GSA Head Sees Ceiling Tripled On Procurements by Agencies

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Federal agencies may soon be able to procure on their own authority DP equipment valued at up to $1 million, according to Frank J. Carr, commissioner of the General Services Administration's (GSA) Automated Data and Telecommunications Services (ADTS).

Presently, any system costing more than $300,000 must be approved by the GSA.

The increase to a $1 million ceiling will probably be made in about a year, by which time GSA will have been able to fully evaluate the program's success, Carr told a session of the Association for Computing Machinery's annual meeting held here earlier this month.

Carr said the program, which now gives agency management "blanket delegation" for procurement valued up to $300,000, has reduced agency procurement requests to GSA by 50%. At the same time, he said, it has only reduced GSA's procurement control by about 5% of the total amount of governmentwide procurements.

In addition, that delegation of authority does not mean agencies are not required to procure DP equipment on a competitive basis, he pointed out.

Giving agencies more direct control over procurements not only has had a "beneficial effect" on agency efficiency, but has also made ADTS more productive in its procurement activity, Carr said. GSA currently has a backlog of only nine agency requests.

Describing the program as a success, Carr

(Continued on Page 54)

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Higher Ceiling on Agency Procurements Seen

(Continued from Page 53)

admitted there remains "an awful lot to do in GSA" to make its procurement process more efficient. A major effort is under way at ADTS to establish policies to clarify the overlap of computer and communications technologies, he said.

Carr, the fifth head of ADTS in its five-year history, explained that his department was established to address just that problem. The "conversion" of the two technologies is "pretty much treated as if it were a new thing, even though its been around for a long time," he stated.

Classification Confusion

Much of the problem is caused by confusion over proper classification of computer and communications equipment, according to Carr, who explained that GSA has separate procurement regulations for the two types of equipment.

As an example of a classification problem, Carr noted computer terminals are obviously DP equipment but also, by their use in distributed DP, involve communications technology. A modem, he added, seems by definition to be a communications device, but often would not be procured if not for its applications in DP activities.

The problem is a "reflection not only of the changes in technology, but also the changes in market structure," Carr said, pointing to the entry of computer and communications equipment vendors into each other's traditional markets.

Discussing GSA's views on procurement activities in general, Carr paraphrased the late professional football coach Vince Lombardi, saying, "Competition isn't the most important thing; it's the only thing."

He added that "the thing that amazes me at times" is that some government personnel are directly opposed to that idea.

Mao's Philosophy

The task of GSA, he said, must be to make its procurement policy clear to government managers. On that subject, he went beyond the sideline exhortations of Lombardi to quote the philosophy of Mao Tse-Tung — "acknowledged as one of the great leaders of our time, irrespective of what you think of his political philosophy."

Brandishing a copy of the small, bright-red book of Mao's sayings, Carr said Mao believed policy is the "starting point" of any organization and is manifested in all of its actions. Before any action is taken, it is necessary to explain the policy to the members of the organization. Otherwise they will "act blindly" and not carry out the policy, Carr said, quoting Mao.

GSA's policy, he continued, is one of "optimum competition" and efficient procurements made in the "shortest possible time frame." To that end, the government must take bold action and avoid "paralysis by analysis." In addition, the most important thing is "to keep things simple."

Carr decried the complicated procurement requests GSA receives from agencies. Consisting sometimes of forms stacked "literally four feet high," many agency procurement requests don't adequately justify the need for greater DP capacity, he said.

The very long procurement cycles Carr has seen "have all tended to be the result of upstream failures to do adequate planning." Agency managers are not getting the right people involved at the right time in the procurement process, he stressed.

This is often the case in requests for noncompetitive, sole-source procurements, which in many cases reflect not a legitimate need for a certain vendor's equipment, but only a lack of planning by agency management, he said.

Kierulff Agrees To Distribute CDC Peripherals

MINNEAPOLIS — Control Data Corp. and Kierulff Electronics, Inc. have reached an agreement that provides for the purchase and distribution by Kierulff of selected CDC OEM computer peripheral products throughout the U.S.

Under the terms of the agreement, Kierulff initially will purchase and distribute CDC memory modules, several models of flexible disk drives and their magnetic recording media.

In the future, the agreement may be expanded to include other OEM peripheral products for the minicomputer and microcomputer markets, the companies said.

Advantages of the distribution agreement for its customers, Kierulff said, include off-the-shelf delivery of products from inventory stock at its 12 nationwide distribution centers and the availability of Kierulff technical product support at these centers.

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Government Shift to Private-Sector DP Urged

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The federal government should be using the computer services industry much more and relying on in-house DP capabilities much less, several industry representatives told the recent annual meeting here of the Association for Computing Machinery (ACM).

Policy guidelines spelled out in the Office of Management and Budget's (OMB) Circular A-76 state that federal agencies — with a few exceptions — must rely on private contactors for DP services, according to Peter Loux, a member of the Association of Data Processing Service Organizations (Adapso). However, "the intent of the A-76 policy is not seriously being applied" in the government and is often "loosely interpreted in favor of the in-house alternative," he said.

Congress has been looking into "reliance on the private sector" for services of all kinds since 1932, Loux noted. A-76 calls for the government to contract with private firms for DP services except when the services are not available commercially or would be more expensive than in-house facilities.

National security considerations are another limiting factor, Loux pointed out.

If that policy were more closely followed, he said, DP services firms would be doing a lot more business with the federal government. Loux blasted OMB, the General Services Administration (GSA) and other agencies that direct federal DP activities for ignoring the policy he said is clearly stated in the A-76 guidelines.

Positive Development

In fiscal year 1977, DP services such as maintenance, programming, operations and time-sharing accounted for more than 26% of all the dollars spent on federal DP, according to figures supplied by Lance Swann, a member of the National Council of Technical Service Industries (NCTSI).

NCTSI is a group of firms that are major contract suppliers of services to the government. The group, like Adapso, is pushing the government to make more use of the private sector for DP services.

One positive development in that direction, Swann said, is that GSA is working to improve its Teleprocessing Services Program (TSP). The program, which certifies companies to supply time-sharing services to federal agencies, was "designed to allow agencies to easily use remote processing" but, in practice, has been found to be "very cumbersome," he contended.

Swann also noted that although agencies can now procure DP equipment valued up to $300,000 without GSA authorization, that ceiling does not apply to DP services. NCTSI is working with Congress, OMB, GSA and other entities to correct that lack of "equivalency" in the procurement process, he said.

In general, Swann stated, the policy outlined in Circular A-76 can benefit both the government and private industry. The DP services industry, he said, "can provide an economic alternative" to in-house government facilities.

In addition, President Carter's goal of controlling the growth of government by controlling government employment will benefit the service industry, he said.

Why DP Services?

Besides strengthening the free enterprise system, government reliance on the private sector offers a number of benefits for federal agencies, Swann maintained. He said the government should use commercial DP services because:

- DP services provided by private contractors are more cost-effective "in the long run" in that the user only pays for the services he needs when he needs them.
- Private companies offer a greater variety of capabilities than those available to a federal DP manager who has only his own system with which to work.
- The DP equipment available will not become obsolete. A services firm could not stay in business if it did not keep up with the latest technology, Swann said.
- There are fewer personnel problems for the government; DP managers can focus more on productivity and less on personnel management.
- Agencies can implement their DP projects more rapidly because the equipment and staff are already available. Managers do not have to worry about long procurement cycles or staffing problems.

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Past Year in DP Industry Hard to Categorize

(Continued from Page 53)

technology firms looking for capital.

But investment in R&D still needed a boost, even though a recent survey showed computer firms are among the heaviest investors in R&D.

Mergers and Acquisitions

Mergers and acquisitions continued at a stready pace in 1978. The surprise takeover of Data 100 by Northern Telecom Ltd. after a bid-off with McDonnell Douglas Corp. contrasted with the matter-of-fact acquisition of Quantor Corp. by NCR.

At year's end, negotiations for several mergers or acquisitions were under way. Microdata Corp. and Addressograph-Multigraph Corp. were talking, and Telenet Corp. and General Telephone & Electronics Corp. (GTE) had agreed in principle to Telenet's acquisition by GTE.

Without actual takeovers, competitors across industry segments began invading each others's domains. At least six companies introduced IBM 370-compatible processors. Some mainframers, such as Honeywell, Inc. and IBM, intensified their efforts in the small-scale end of the market. Itel Corp. and Amdahl Corp. led the way as equipment manufacturers made inroads into software development. With the unbundling of software for its 8100, IBM will, it seems, place greater emphasis on software as a revenue producer.

Companies in the service industry began marketing minicomputer systems, turning the "in-house minicomputer" threat into a business opportunity. Automatic Data Processing, Inc., Keydata Corp. and National CSS, Inc. were early entrants into the mini market, followed later by Scientific Time Sharing Corp. and General Electric Co.'s Information Systems Division.

Mohawk Data Sciences Corp. identified the services segment of the industry as a prime target for its small business systems.

New competitors entered the network business — AT&T with its proposed Advanced Communications Service and Xerox Corp. with its Xerox Telecommunications Network.

This cross-fertilization of markets will probably spawn plenty of new business for lawyers. Industry suits continued to proliferate, and five companies are now in the process of suing Data General Corp. Most litigants claim DG is trying to prevent them from marketing a Nova-compatible processor.

National Semiconductor Corp. sued Digital Equipment Corp. in a move to clear the air for marketing a processor compatible with DEC's PDP-11/34.

The U.S. vs. IBM antitrust trial waxed on, but the Memorex vs. IBM antitrust case ended in a hung jury, giving IBM a psychological victory — at least until Memorex's appeal is decided.

International Scene

On the international scene, threats from the Japanese were still on the mind of industry executives. Although the Japanese government stated it will make its markets more competitive for U.S. vendors, that intention did not become a reality.

For the time being, the Japanese are making inroads into components rather than equipment. Industry participants consider the sales and service capabilities of the Japanese still too fragmented to seriously undermine U.S. equipment and services vendors.

Transborder data flow was an issue that cropped up repeatedly during the year. U.S. firms in the services industry saw some tactics of France, Japan and Canada as designed to prevent U.S. firms from competing in those markets.

Increased pressure on Congress by industry associations for restrictions on foreign firms setting up offices in the U.S. is expected.

Despite the economic uncertainty predicted for 1979, the U.S. computer and office equipment industry contributed a favorable balance of trade of $1.99 billion for the first nine months of the year. That was a 16% increase from last year's favorable trade balance.

And the computer industry came of age as the Charles Babbage Institute and the American Federation of Information Processing Societies embarked on projects to record its history.

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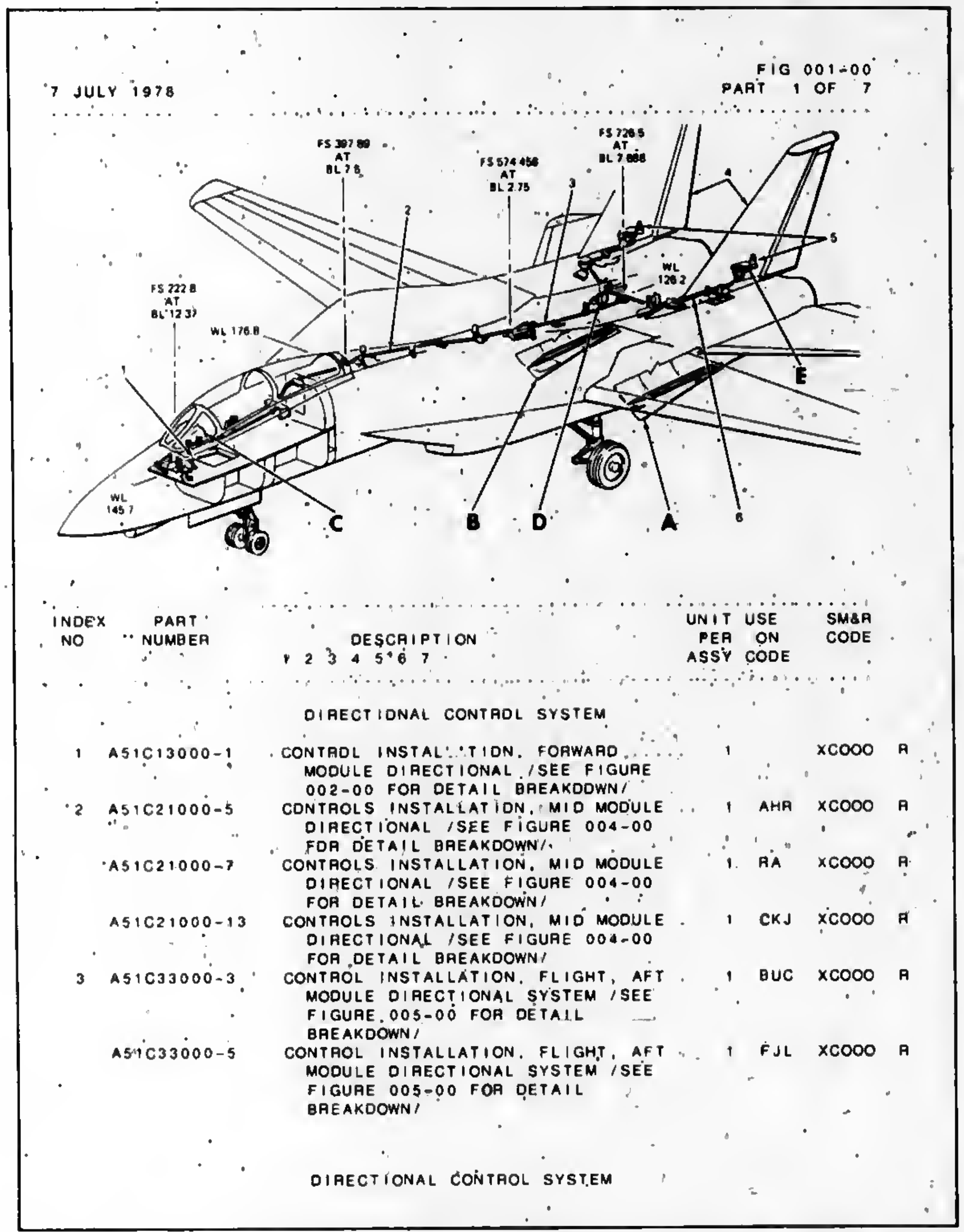
FS 397.80 AT BL 7.5
FS 574.456 AT BL 2.75
FS 726.5 AT BL 7.888
FS 222.8 AT BL 12.37
WL 176.8
WL 126.2
WL 145.7
1
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7 JULY 1978

FIG 001-00
PART 1 OF 7

INDEX NO	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNIT PER ASSY	USE ON CODE	SM&R CODE	
		DIRECTIONAL CONTROL SYSTEM				
1	A51C13000-1	CONTROL INSTALLATION, FORWARD MODULE DIRECTIONAL /SEE FIGURE 002-00 FOR DETAIL BREAKDOWN/	1		XCOOO	R
2	A51C21000-5	CONTROLS INSTALLATION, MID MODULE DIRECTIONAL /SEE FIGURE 004-00 FOR DETAIL BREAKDOWN/	1	AHR	XCOOO	R
	A51C21000-7	CONTROLS INSTALLATION, MID MODULE DIRECTIONAL /SEE FIGURE 004-00 FOR DETAIL BREAKDOWN/	1	RA	XCOOO	R
	A51C21000-13	CONTROLS INSTALLATION, MID MODULE DIRECTIONAL /SEE FIGURE 004-00 FOR DETAIL BREAKDOWN/	1	CKJ	XCOOO	R
3	A51C33000-3	CONTROL INSTALLATION, FLIGHT, AFT MODULE DIRECTIONAL SYSTEM /SEE FIGURE 005-00 FOR DETAIL BREAKDOWN/	1	BUC	XCOOO	R
	A51C33000-5	CONTROL INSTALLATION, FLIGHT, AFT MODULE DIRECTIONAL SYSTEM /SEE FIGURE 005-00 FOR DETAIL BREAKDOWN/	1	FJL	XCOOO	R

DIRECTIONAL CONTROL SYSTEM

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Semi Outlook Uncertain

Although predictions on the state of the economy next year vary considerably, recent indications are that the semiconductor industry is getting edgier about its prospects.

As reported in a recent article in *Forbes*, Charles E. Sporck, president and chief executive officer of National Semiconductor Corp., said he has seen an increased amount of "double ordering" — often an indicator of bad times ahead for the semiconductor industry.

Double ordering was reportedly a significant factor in the industry in 1974-1975.

Wall Street observers, too, are becoming concerned. After a period of recommending semiconductor stocks, several analysts have lately turned bearish on them.

One industry analyst said backlogs are running at a rate that would imply a 50% growth rate for the industry. Even in boom times, this would be unlikely.

Within the semiconductor industry itself, executives are unable to agree. Several high-level managers to whom *Computerworld* recently spoke expressed varying degrees of confidence in the economy

Dealers' Market At $1.5 Billion, CDA Reports

PHOENIX — The market shared by brokers, dealers and lessors which are members of the Computer Dealers Association (CDA) has grown to more than $1.5 billion, according to William S. Grinker, the CDA's newly elected president.

With the election of an additional 42 members during the past year, CDA's membership has grown to 101 members, up from 11 members when organized in 1971, Grinker, executive vice-president of American Used Computer Corp., said.

"The significant development accompanying our [organization's] accelerated growth is that CDA now represents almost the entire domestic used computer industry," Grinker told attendees at CDA's annual convention, held here recently.

"But used computers comprise an international market," he noted. "Moreover, the present exchange rates favor acquisition of U.S. computer equipment by foreign companies."

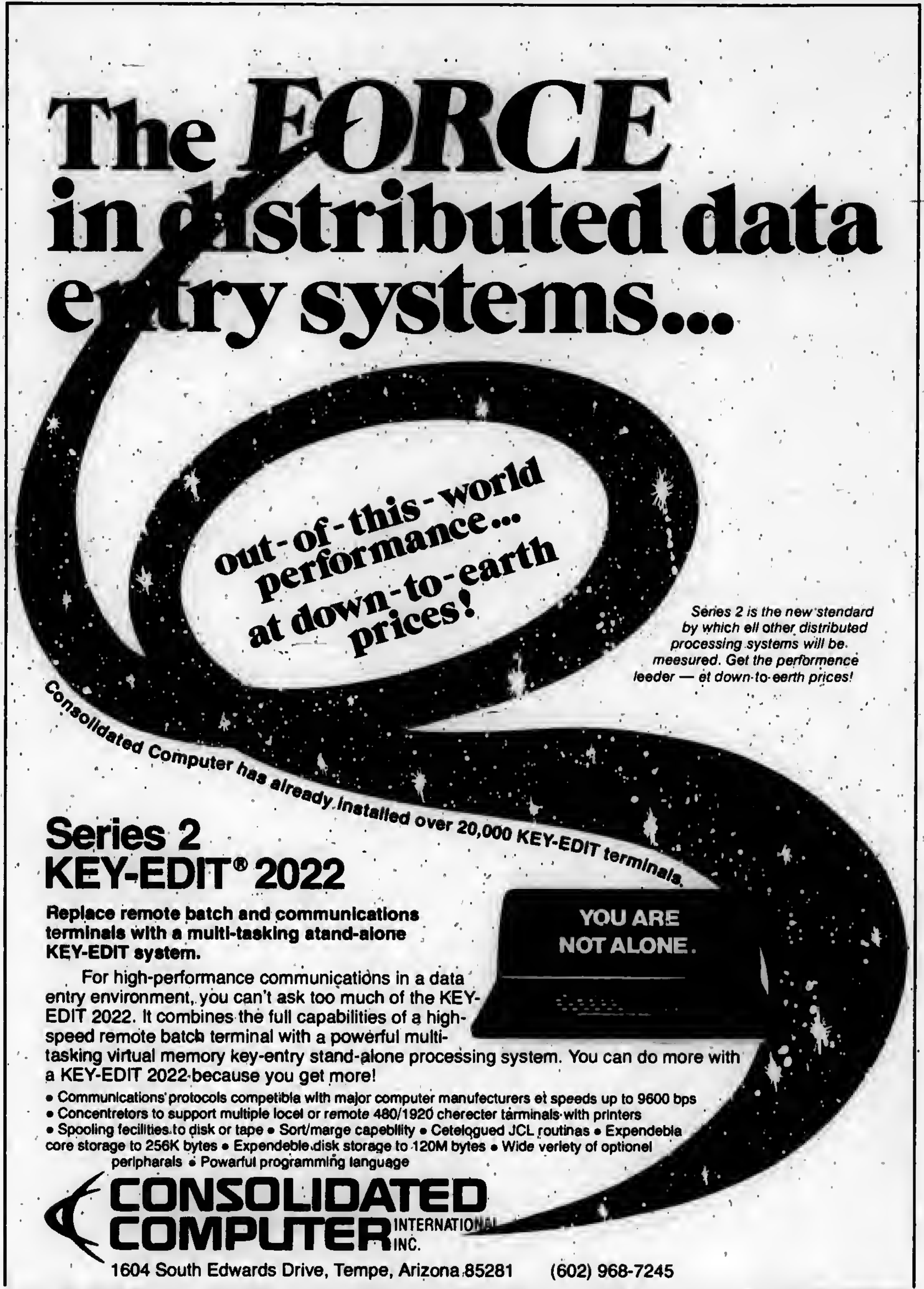
CDA is now expanding its membership on a worldwide basis and has admitted computer lessors as full-time members. Lessors were previously granted associate member status.

Companies with business related to the computer industry but which are not equipment dealers or lessors are now eligible for associate membership.

Aside from Grinker, the other 1979 CDA officers are Kenneth A. Bouldin, president of Econocom, CDA chairman; Robert Kendall of Leasing Dynamics, Inc., treasurer; and Ronald Breckner of Data Sales Co., Inc., secretary.

Vice-presidential posts for 1979 are being filled by Richard Baker of Dataware, Inc.; Nick Cicchitti, NVC Computer Sales, Inc.; William Roselius, Computer Sales International, Inc.; Stuart Rubenstein, IOA Data Corp; and Harvey Berlent, Berlant Industries, Inc.

With the expansion of its activities, "CDA can serve as the industry spokesman with vendors, government agencies and the communications media," Grinker stressed.



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Yet, while these products have some of the highest ratings in recent DATAPRO surveys, they also are replaced most often, because they were not able to keep pace with users' rapid growth and expansion.

In addition, they offer at best limited programmer-supported multithreading, so performance suffers even more as volume increases. Finally, they lacked the full set of features users quickly find absolutely necessary. Some of these important features include automatic file recovery, on-line programming, RJE, integrated DBMS support with synchronized recovery, test and debugging aids; plus all of the vital pre-programmed utilities.

However, alternatives to mini-systems do exist — complex full-feature systems. Most can achieve acceptable performance in higher volumes, particularly those that provide reentrant COBOL and other necessary performance options. And most have the basic set of features necessary to implement complete TP Systems.

Unfortunately, many of these complex systems are notorious for lengthy installations (after many weeks), extensive education requirements, and time-consuming staff start-up times. Further, these systems invariably require one or more dedicated systems programmers for maintenance, tuning, "firefighting" and installing endless enhancements.

Obviously, there had to be a better way. There is, and it is called SHADOW II. SHADOW II combines the full features and top performance of complex systems, with easy-to-use reliability usually associated with mini-systems.

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3. **Benchmarks**
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Northern Telecom Revamps Sales Organization

MINNEAPOLIS — Northern Telecom Systems Corp. has consolidated the U.S. sales and service organizations of Data 100 Corp. and Sycor, Inc. and made a series of marketing appointments.

In making the announcement, John C. Lobb, chairman and president of Northern Telecom, said, "In integrating the domestic sales and support activities of both companies," we believe that the corporation can more profitably exploit current and future market opportunities and can, at the same time, provide users with a much broader range of information processing equipment backed by a single, cohesive organization."

The new organization will have approximately 300 people in field sales, 200 in systems engineering and 1,200 in field engineering.

The recent Northern Telecom Systems appointments include Paul C. La Voie, senior vice-president of marketing; Anthony L. Fazio, vice-president of sales; Paul T. Cochlan, vice-president of field engineering; and John S. Cain, vice-president — marketing controller.

All marketing and support activities outside the U.S. will be the responsibility of E. Trevor Robinson, Northern Telecom Systems senior vice-president for international operations.

Northern Telecom Systems Corp. was formed earlier this year to manage Northern Telecom's computer-related businesses, including Data 100 Corp. of Minneapolis and Sycor, Inc. of Ann Arbor, Mich.

Other Moves

- Dennis M. Mannion has been named vice-president of operations at Documation, Inc.
- Alex Bernstein has joined the Brandon Consulting Group as a senior consultant.
- David C. Pixley has been named by the board of directors of Genesse Computer Center, Inc. as president and chief executive officer, and Kurt Enslein has been named senior vice-president and chief scientist.
- Robert B. Hawkins has been named executive vice-president of Control Data Corp.'s Computer Group. He will be in charge of managing the company's activities in international ventures and cooperative programs involving technology exchange.
- Paul J. Mozola has been named vice-president of the Midwestern region of Data Processing Security, Inc.
- Byrne O'Brien has been named director of administration and finance and Michael Nugent has been named staff attorney at the Association of Data Processing Service Organizations.
- Jack Robinson has been appointed regional marketing director for the Midwest and West Coast operations of Data Access Systems, Inc.
- Thomas Frenier has joined Dearborn Computer Co. as controller, Jack Hughes has joined as its manager for the Western region and Robert Meyer has joined as manager for the Northeast region. Another new employee, Robert Neumeyer, has been appointed product manager, and William Eick is the firm's new regional manager of software sales.
- Leland C. Fay Jr. has been named president of Evidex Corp., a Chicago-headquartered litigation support service company.
- John J. McElroy has been appointed president of Interactive Data Corp.

Executive Corner

- R.E. (Bob) McKeon has joined ITT Courier Terminal Systems, Inc. as vice-president of field engineering.
- Daniel Toth has been named vice-president for communications industry marketing for the Infonet Division of Computer Sciences Corp.
- A.C. Rice has been elected to the board of directors of Tandem Computers, Inc.
- Juan A. Rodriguez has been appointed vice-president and general manager of Storage Technology Corp.'s Disk Division.
- Joseph J. Kroger has been named president of Univac's Marketing and Services Division and Paul J. Spillane has been named president of the firm's Products Division.
- Donald P. Stearns has been named national sales manager for the Peripheral Products Division of Datum. Inc.
- Jesse A. Simmons has been appointed vice-president and controller of Inforex, Inc. Robert J. Moore has been appointed senior vice-president of the firm.

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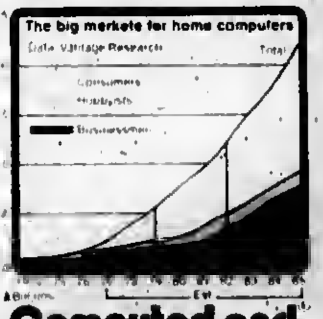

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Bradford to Develop Parent-Tracing System

NEW YORK — Bradford National Corp. has signed a long-term contract to develop a model computer system that will aid states in locating and billing absent parents who fail to make legally mandated child support payments.

The contract was awarded by the Office of Child Support Enforcement in the U.S. Department of Health, Education and Welfare (HEW). The model system is scheduled to be made available by HEW to child support enforcement agencies of interested states during 1979.

The contract award announcement was made by John W. Knight, senior vice-president of the Bradford subsidiary that will execute the contract.

"By assisting in the location of absent parents, billing them for child support and producing enforcement and management reports with appropriate privacy safeguards, the system is expected to significantly improve the effectiveness of state-administered child support programs and reduce government expenditures in this area," Knight said.

In recent years, child support welfare costs have soared, and the taxpayer has been forced to assume the fiscal responsibilities of many absent parents who have the financial capability to meet their obligations, he explained.

Extension of the program was described by HEW Secretary Joseph A. Califano Jr. as a contributing step in reforming the nation's welfare system. As the program goes into effect state by state during 1979, Califano said, it will aid HEW in reaching its goal of more than doubling the $423 million in child support collected by states from absent parents in fiscal 1977.

Bradford has been active in developing and/or operating such systems on a state-by-state basis since enabling legislation was first passed in 1975, Knight noted. It has provided such systems for Alabama, Massachusetts, Montana and North Carolina and currently Arizona.

Contracts

Other Awards

Microprocessor Computer Systems Corp. has received a $60,000 contract for the sale of terminal equipment to Storage Technology Corp. The equipment will include teletypewriter terminals and Soroc IQ 120 CRT terminals.

Computer Sciences Corp. has received a contract from the General Services Administration to provide computer-related services to fulfill mission requirements of the Interagency Data Systems Facility, Huntsville, Ala. The contract is valued at more than $22 million over the full three-year period if all options are exercised.

Rockwell International's Electronic Systems Group has been awarded a $12 million contract by the U.S. Air Force for Transportable communications systems.

The U.S. General Services Administration (GSA) has awarded 11 contracts worth $25.6 million. Five of the contracts were awarded to small businesses: CPT Corp., Capitol Consultant Services, American Hospital Supply, Norward Industries Inc. and Alliance Rubber Co. Other contracts were awarded to Eastman Kodak Co., Addressograph-Multigraph Corp., Dictaphone Corp., General Electric Co., Tektronix, Inc. and Hewlett-Packard Co.

Several contracts worth $21.6 million have been awarded by the U.S. General Services Administration (GSA). Memorex Corp. received a $1.5 million order for tape, Wabash Tape Corp. got a $2 million contract for DP tape and Hewlett-Packard Co. gained a $6 million contract for data acquisition systems.

Cubic Corp. has been awarded two contracts totaling $13.7 million by the Hong Kong Mass Transit Railway Corp. for automated fare collection equipment.

Logicon, Inc. has received a $2.1 million Air Force contract to continue its work in the design and development of a new North American air surveillance system.

Ontel Corp., a subsidiary of Caesars World, Inc., has received an OEM contract valued at more than $1.5 million from Control Data Corp. The contract calls for a two-year shipment of the basic display terminal Ontel also uses in its proprietary OP-1 intelligent terminal system.

Computel System Ltd. has signed a major contract with Yamaha Motors Canada Ltd. of Toronto. Under the terms of the contract, Computel will provide on-line services for Yamaha's order entry, invoicing, accounting and inventory control applications.

Univac Corp. has been awarded a contract by the Internal Revenue Service Data Center in Detroit for a Univac 1100/82.

United Computing Systems, Inc. has received a contract from the Environmental Protection Agency for consulting services relative to the company's Inform-11 data management software package.

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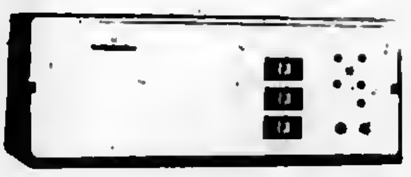
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Trade Shows Scheduled

WASHINGTON — France and Italy are ripe for imports of computer equipment, according to the U.S. Department of Commerce.

To give American manufacturers a piece of the action, the Commerce Department will sponsor a U.S. Business Equipment and Systems Exhibition in Paris June 5-8 and one in Milan — EDP/U.S.A. — June 19-22.

U.S. government market research studies indicate the French business equipment market is growing at 14% per year and could hit $1 billion by 1980.

Currently, imports supply 80% of this market and are likely to hold that share over the next five years, the Commerce Department said.

Similarly, only eight domestic manufacturers supply the Italian market for computers and related equipment — a market that is expected to climb from a current $529.2 million to $968.8 million by 1982, according to Commerce projections.

Great Potential

Small business computers and the personal/hobby computer market offer the greatest potential for U.S. sales in that country, the agency said.

More information about either show is available from the Commerce Department's Office of International Marketing, Washington, D.C. 20230.

GTE and Telenet Finalize $59 Million Merger Plans

STAMFORD, Conn. — General Telephone & Electronics Corp. (GTE) and Telenet Communications Corp. have reached an agreement in principle whereby GTE will acquire Telenet's outstanding common shares for approximately $59 million.

Shareholders controlling about 55% of the outstanding common stock have already agreed to an exchange of shares in the ratio of .7652 shares of GTE for each share of Telenet, the companies reported.

GTE said it does not anticipate any problem in acquiring the remaining 45% of the outstanding stock.

Furthermore, counsel for GTE has determined that approval from the Federal Communications Commission will not be necessary, a company spokesman said.

Telenet began its packet-switching service in August 1975. Sales for 1978 are expected to reach $9 million. The company's services are available in more than 170 cities in the U.S.

The merger is expected to be finalized during the first quarter of 1979, a GTE spokesman said, adding that GTE will most likely incorporate Telenet's operations into a new subsidiary.

Supershorts

National Computer Systems, Inc. (NCS) declared a 25% stock dividend on all outstanding common shares, equivalent to a five-for-four stock split. NCS also increased the quarterly cash dividend from 5 cents to 6 cents a share. Both cash and stock dividends are payable Jan. 2.

— — —

CSP, Inc. opened a regional sales office in Santa Clara, Calif., to market and provide technical support for its line of MAP array processors in 11 Western states.

— — —

The Microfilm Products Division of 3M Co. has acquired Photomedia Co., Inc., producer and distributor of vesicular film products for microcopying computer output microfilm.

— — —

Integrated Computer Systems, Inc., which provides technical education in applied computer sciences, has set up East Coast regional headquarters in Alexandria, Va.

— — —

Digital Equipment Corp. and Qume Corp. have named Tele-Data, Inc. as sales representative for part of their keyboard printer terminal lines. Tele-Data will sell and lease Decwriter 11 and Qume's Sprint 5 daisywheel terminals.

— — —

Wang Laboratoties, Inc. broke ground for a $7 million, 250,000 sq-ft addition to its Tewksbury, Mass., facility that will produce computer processors and some peripheral devices. Slated for completion by June, the building will bring the Tewksbury manufacturing complex to more than 600,000 sq ft.

— — —

Hewlett-Packard Co. declared a regular quarterly cash dividend of 15 cents per common share, payable Jan. 15 to stockholders of record Dec. 27.

— — —

Pertec Computer Corp. (PCC) plans to buy about 85,000 of its own common shares over the next few months for distribution to employees under its stock purchase plan. PCC does not expect to acquire more than 100,000 shares in any six-month period.

— — —

California Microcomputer Co., Inc. signed a joint venture agreement with ACC Micro-Business Systems, Ltd. in England to assemble, distribute and service the U.S. firm's 7700 series of business computer systems in the UK.

Saving money by not doing it yourself

A guide to applications packages in January 29 Computerworld.

The increasing flexibility of the new software packages is rapldly making in-house development the exception rather than the rule of software planning. And more and more vendors are marketing easily convertible software packages to suit the tlme and budget needs of computer-users, large and small.

Applications Packages is the subject of our January 29 *Computerworld* Special Report, and in it we'll be examing many of the ways users are putting these newer, more flexible packages to work for them. Edited by Don Leavitt, *Applications Packages* will take a look at the increasing technological (and financial) feasibility of these new packages, and why they've become so attractive to users. We'll have vendors' stories as well, with articles on:

- *Software evaluation — choosing the right packages for the right system*
- *Cutting the costs of software maintenance*
- *Program conversion — is it worth the effort?*
- *"Firmware emulation"* and the technology behind portable packages.

If you're an MIS Executive, DP Manager, Supervisor or Lead Programmer, our January 29 Special Report will make some informative reading. And if you market programming products or services, here is a good place to put your advertising. Ad closing date is January 12, and your *Computerworld* representative can give you all the details. Or, to reserve space for your ad, call Terry Williams at (617) 965-5800.

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Conditions Include: Four weeks annual leave, fares for appointee and family plus some assistance for removal expenses.

Applications: Detailed applications including the names and addresses of three referees should be submitted not later than 12th January, 1979 to the Appointments Officer, Western Australian Institute of Technology, Hayman Road, South Bentley, 6102, Western Australia. A brochure containing further information may be obtained from the above address.

When applying please quote position reference number and following media code CW4.

0921

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Chairman, Data Processing Division/Administrator of Computer Center (combined position), at small, non-profit, private college offering Bachelor's degree in data processing. Excellent placement record.

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Our present hardware is IBM 370, IV Phase and Entrex equipment. Qualified applicants should send resume and salary history to Bob Marks, Manager of Systems and Programming, DEKALB AgResearch, Inc., Sycamore Road, DeKalb, Illinois 60115. EOE,M/F.

PROGRAMMER ANALYST

PROJECT LEADERSHIP RESPONSIBILITY

Upper Peninsula

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The ideal candidate will have 5 to 7 years in design and programming of business systems in an OS/VS1, IMS, IBM 370 Series Installation. The individual should enjoy a challenging yet informal work climate; an appropriate college degree is considered desirable.

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We also offer an excellent salary plus year end bonus. Our non cash compensation program is Company paid and comprehensive, and includes immediate fully paid family hospital and medical, dental coverage, Life insurance and 3 weeks paid vacation after the first year.

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The Cleveland-Cliffs Iron Company
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1460 Union Commerce Building • Cleveland, Ohio (216) 241-2356

The Cleveland-Cliffs Iron Company

Mini-Computer Programmer

PDP 11/45 7/32, 8/32 DG NOVA SEL 32/55, HP 3000, Honeywell Level 6 H 716, Two years exp. Req. Suburban Virginia & Md. locations, U.S. Citizenship req. $17-23K. Relocation Pd. Rush resume: Cybermatrics Corp., P.O. Box 579, McLean, VA 22101 Tel (703) 356-1997. Other positions avail USA & OS.

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Director of Data Processing

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Applicants must have at least 7 years experience in Computer Operations and 2 years experience at the Senior Management level. College graduation in Business Administration, Industrial Engineering or related field can serve as the equivalent of 2 years experience.

This position involves management of a computer center, with emphasis on understanding of industrial engineering techniques, systems analysis, development and implementation of computer assisted systems. It also involved computer hardware and software development, purchasing and maintenance, data base management, data communications and data security systems, with demonstrated ability to schedule the efficient use of such resources to achieve pre-planned objectives.

Salary mid-30s. For application contact:

Wilma Wright, Hospital Personnel Services,
Box 500 May, 420 Delaware Street S.E.
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An AAE

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Please submit resume with salary history and writing/editing samples to Ms. C. Purdy, Rm. 3C-333, Bell Laboratories, Corporate Headquarters, 600 Mountain Av., Murray Hill, New Jersey 07974. An equal opportunity employer m/f.

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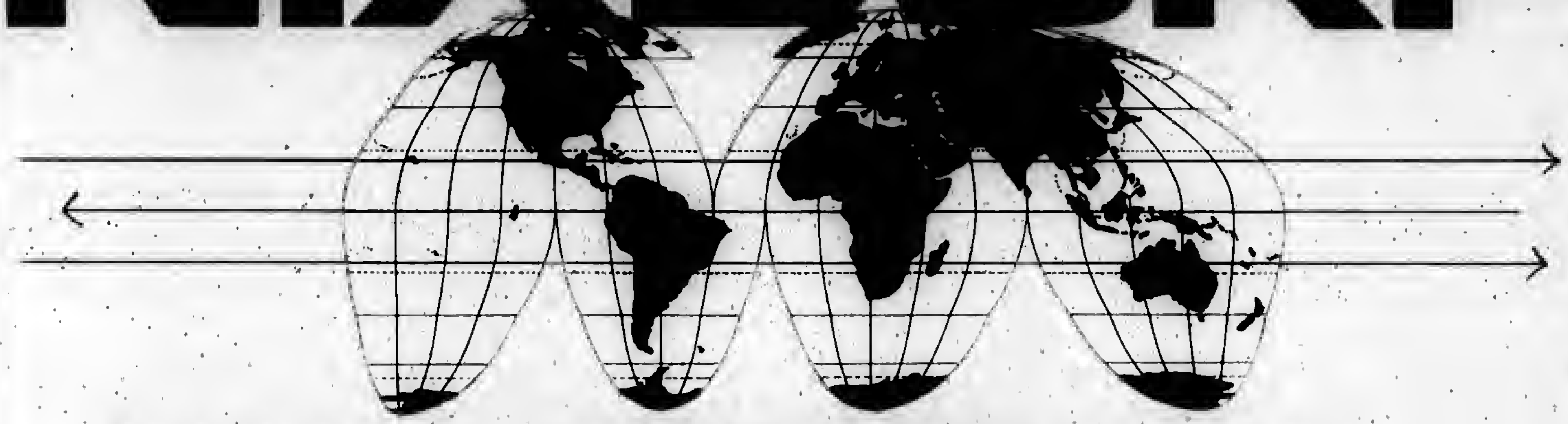

We're one of the world's leaders in the design, development, and manufacture of source data and distributed data processing systems, on-line interactive displays, remote batch terminals, data entry systems, and small business computer systems.

Our capacity to meet the challenges of new technology and applications have enabled Nixdorf to maintain a state-of-the-art environment and a rate of growth that well exceeds the industry average.

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- **Transaction Processsing**
- **Distributed Data Base**
- **Hierarchial File Structure**
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Specific expertise is required in the following areas:

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- **File Management Sub System**
- **Compiler/Interpreter**

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Mini Computer Programmers

Background in systems software development, assembly language background preferred. Design, develop and debug mini-computer operating systems related to Word Processing, Source Data Processing, Data Entry and Distributed Data Processing.

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Position includes systems design, coding, systems test and debug.

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Design, develop, and debug micro processor operating systems, related to Word Processing and Intelligent Terminal Family.

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To work on the design and development of microprocessor based intelligent CRT terminal systems. Requires BSEE plus three years experience with 8080 or Z80 microprocessors; peripheral interface and controllers; TTL and MOS devices; CRT monitors, communications and/or disk control.

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Will provide design engineering support in the resolution of problems encountered in the manufacturing operation. Requires BSEE and design/re-design experience in the small business computer industry.

Cost Reduction Design Engineers

To actively work in reducing the cost of our product designs. Will apply expertise to video displays, power supplies and intelligent controller enhancement. Requires BSEE plus minimum two years experience in several of the above areas.

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Will perform peripheral device evaluations for our distributed data processing systems such as disk media, tape drives and printers. Requires BSEE with minimum two years experience with several of the above peripherals.

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Presently we are seeking a seasoned Field Service professional with at least 3-5 years in the field and another 2-5 years experience in course development and class presentation. In depth knowledge of mini-computer systems and peripherals, such as tapes, discs, printers, card equipment, selectric and CPUs is required. The successful candidate will be a graduate of a 2 year technical school or equivalent in basic electronic and electrical studies. Experience in technical writing, machine language or diagnostic programming would also be helpful.

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Due to our expanded operations, we have need for an additional national support specialist. We seek a Field Service professional with a minimum of 3 years hands-on experience in maintaining computers and related peripherals. Direct hands-on experience with commercial data communications equipment is required. Technical schooling graduates or those with an Associate's degree in Electronics (or military equivalent) will be considered. Technical expertise, as well as tact and personal confidence is essential to interface with customers and all internal technical groups. Approximately 25% travel involved. Initial orientation assignment may be in Europe.

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John Wheeler
Division 3531
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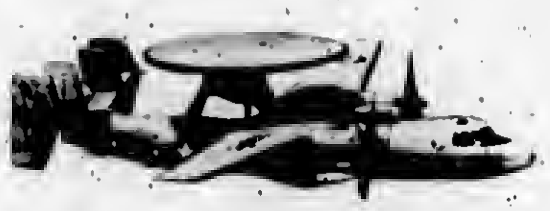

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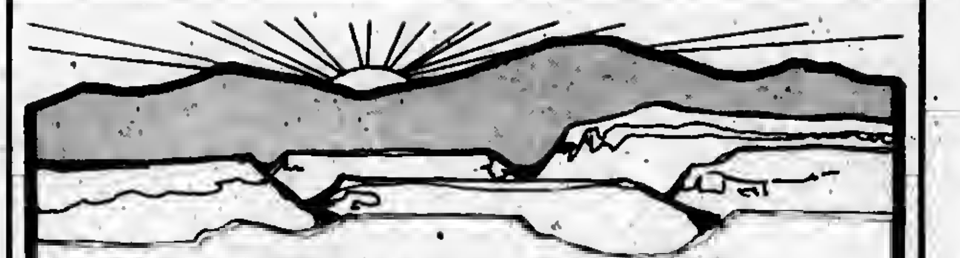

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Systems Analyst

San Francisco Area

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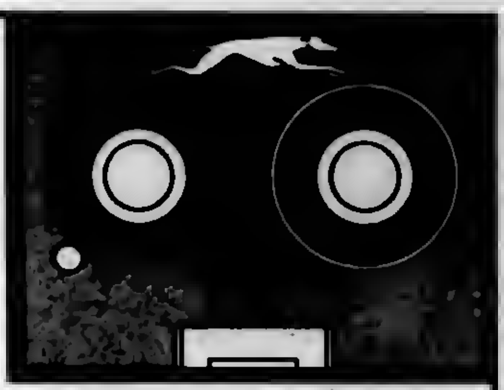

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Inspection: 8 A.M.-4:30 P.M., Jan. 8-9

HIGHLIGHTS:

Computer Eqpt.: IBM 360/40 consisting of IBM 2040-G, 128K processor, IBM 1052 Console • IBM 2540 Card Rdr. & Punch • (9) Potter 4314 Disc Drives • Potter 2406 Tape Drives • Potter 5803 Tape Controller • Potter 3403 Line Prtr. • CIG 40+ Memory System • IBM Mod. I Card Punch Control • Potter 5314 Disc Control • Data-aire Mark IV Air Conditioner • Data Safe & Racks • Misc. Computer Eqpt.: (12) Data Point 2200 Tape Writers, (2) Centronics Data Prtrs., Memorex Viewers, Printers, Developer, Moore 400 Burster, Moore 284B Decollator.

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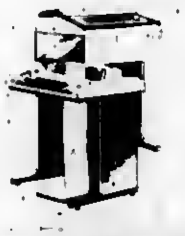

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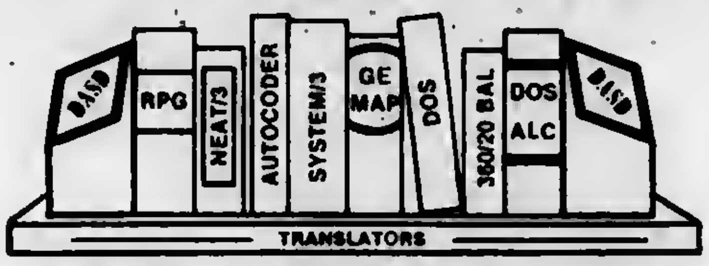

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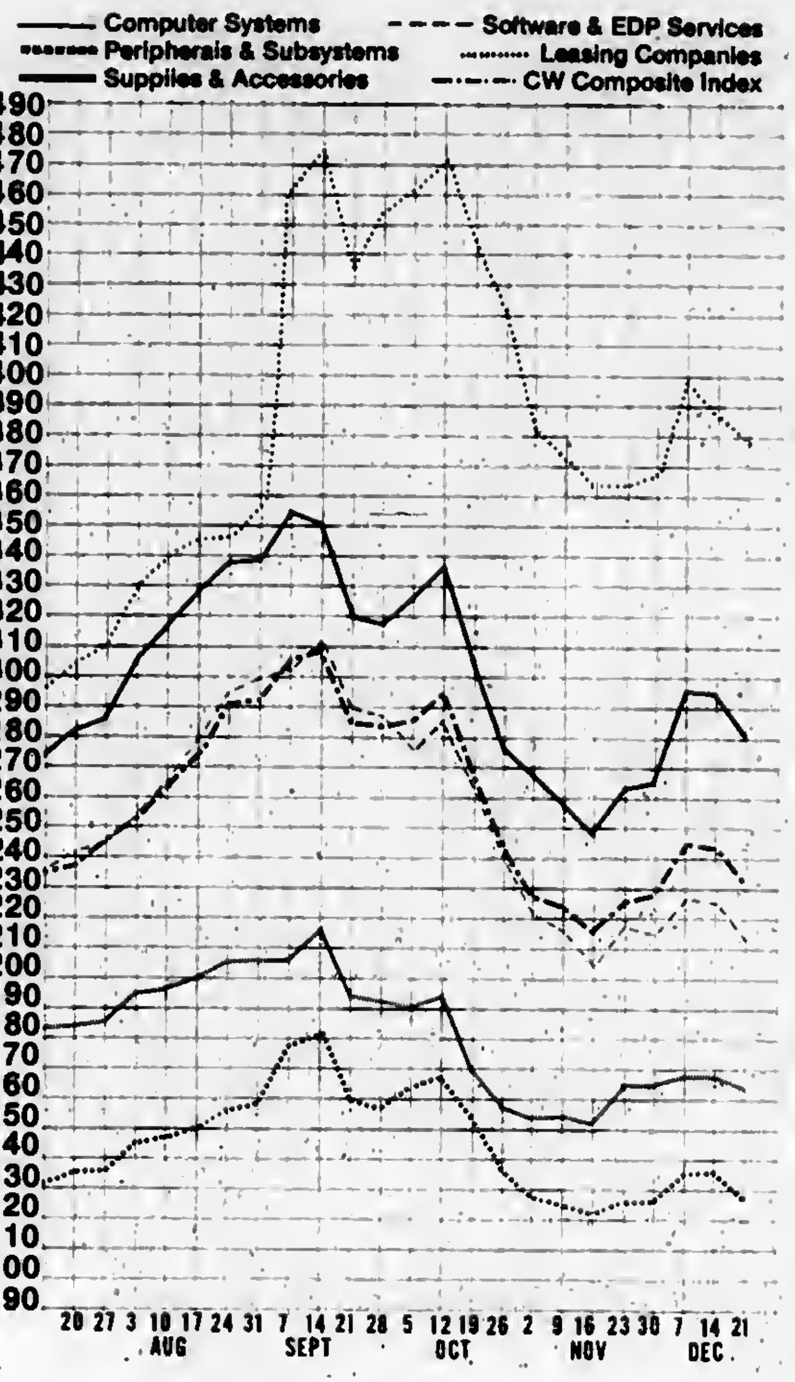

Earnings Reports

DATARAM

Three Months Ended Oct. 31

	1978	1877
Shr Ernd	$1.14	a$1.12
Revenue	4,383,000	4,0S1,000
Earnings	S89,000	689,000
6 Mo Shr	2.25	a2.06
Revenue	6,506,000	7,754,000
Eernings	1,181,000	1,076,000

a-Adjusted for e 10% slock dividend paid in June 1878.

DIGI-LOG SYSTEMS

Yeer Ended Sept. 30

	1978	1977
Shr Ernd	$.68	$,92
Revenue	4,825,06S	4,083,330
Tax Cred	97,875	298,200
Earnings	S15,337	634,100
3 Mo Shr	.18	.26
Revenue	1,154,387	1,172,198
Earnings	117,3SS	188,518

MANUFACTURING DATA SYSTEMS

Three Months Ended Nov. 30

	1976	1977
Shr Ernd	$.27	$.20
Revenue	8,972,000	6,017,000
Earnings	822,000	809,000

PENRIL

Three Months Ended Oct. 31

	1876	1977
Shr Ernd	$.18	$.18
Revenue	3,428,503	2,829,46S
Earnings	247,884	22S,493

PRIME COMPUTER

Three Monthe Ended Oct. 1

	1878	1977
eShr Ernd	$.40	$.18
Revenue	26,040,000	13,672,000
Earnings	2,310,000	1,0S2,000
e9 Mo Shr	1.03	.48
Revenue	67,013,000	34,201,000
Eernings	5,836,000	b2,540,000

e-All per-share earnings are adjusted to reflect a Mey 23, 1978 two-for-one slock split. b-Includes tax-loss carryforward of $150,000.

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Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES TUESDAY, DECEMBER 19, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE			
		1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP.	28- 69	47 7/8	- 7/8	-1.7
N	BURROUGHS CORP	59- 87	70 7/8	+ 3/8	+0.5
O	COMPUTER AUTOMATION	15- 44	21	-1 1/4	-5.6
N	CONTROL DATA CORP	23- 44	52 5/4	-1 1/8	-3.5
O	CRAY RESEARCH INC	8- 33	29 1/2	-1	-3.2
N	DATA GENERAL CORP.	42- 71	58 1/4	-1 3/4	-2.9
M	DATAPOINT CORP	34- 75	67 1/8	+ 7/8	+1.3
M	DIGITAL EQUIPMENT	39- 54	48 5/8	-1 3/8	-2.7
N	ELECTRONIC ASSOC.	2- 15	6	-1	-14.2
A	ELECTRONIC ENGINEER.	9- 19	10 7/8	-1 1/8	-9.3
N	FOUR-PHASE SYSTEMS	19- 46	28	-2 1/2	-8.1
N	FOXBORO	28- 40	30 7/8	-1 3/4	-5.3
O	GENERAL AUTOMATION	7- 26	15 5/8	-1 1/8	-6.7
O	GRI COMPUTER CORP	1- 3	1 1/4	0	0.0
N	HEWLETT-PACKARD CO	62- 93	88	+1 1/8	+1.2
N	HONEYWELL INC	43- 72	66 1/4	- 1/2	-0.7
N	IBM	236-505	282 7/8	+8 5/8	+3.1
O	MANAGEMENT ASSIST	9- 29	16 1/2	-1 3/8	-7.6
O	MANUFACTURING DATA S	9- 23	18	-1 1/8	-5.8
O	MICRODATA CORP	10- 23	17 1/8	-1 1/4	-6.8
O	MINI-COMPUTER SYST	4- 8	5 1/4	- 3/4	-12.5
O	MODULAR COMPUTER SYS	7- 17	13 1/2	-1	-6.8
M	MCR	37- 67	58	-2 7/8	-4.7
N	PRIME COMPUTER INC	20- 43	30	-1 1/2	-4.7
N	PERKIN-ELMER	17- 29	25 7/8	-1 3/8	-5.0
N	SPERRY RAND	33- 49	42	-1 3/8	-3.1
A	SYSTEMS ENG. LABS	11- 24	13 3/8	-1	-6.9
O	TANDEM COMPUTERS INC	13- 37	22 1/4	-2	-8.2
A	WANG LABS.	12- 52	28 3/8	- 5/8	-1.5

LEASING COMPANIES

EXCH		PRICE			
		1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	13- 21	21	- 1/4	-1.1
O	COMDISCO INC	5- 22	13 3/4	-1	-6.7
A	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	2 5/8	- 1/8	-4.5
C	CONTINENTAL INFO SYS	5- 15	6 1/2	- 3/4	-10.3
N	DATRONIC RENTAL	1- 5	2 1/4	+ 1/4	+12.5
A	DCL INC	5- 5	4 5/8	0	0.0
N	DPF INC	8- 14	10	-1	-9.0
N	ITEL	16- 35	25 5/8	- 1/8	-0.4
N	LEASCO CORP	24- 36	35 1/8	-1 7/8	-5.5
O	LEASPAC CORP	1- 4	2 5/4	- 1/8	-4.3
A	PIONEER TEX CORP	5- 7	3 1/8	0	0.0
N	U.S. LEASING	13- 20	14 1/2	-1	-6.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		PRICE			
		1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	7/8	- 1/8	-12.5
O	ANACOMP INC	8- 22	11 1/8	- 3/8	-3.3
A	APPLIED DATA RES.	8- 17	10 1/2	- 1/2	-4.5
N	AUTOMATIC DATA PROC	24- 56	29 1/2	-1 1/2	-4.8
O	COLEMAN AMERICAN COS	1- 2	5/8	0	0.0
O	COMPU-SERV NETWORK	6- 12	5 1/2	- 1/4	-4.3
O	COMPUTER HORIZONS	1- 9	6 1/4	- 3/4	-10.7
O	COMPUTER NETWORK	6- 16	6	- 5/8	-9.4
N	COMPUTER SCIENCES	8- 17	10 5/8	- 3/4	-6.3
O	COMPUTER TASK GROUP	1- 4	4 1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 5/8	- 1/8	-5.0
O	COMPUT AUTO REP SYC	4- 10	6 1/8	- 1/8	-2.0
O	COMSHARE	6- 19	14	-1 1/4	-8.1
O	CULLINANE CORP	14- 35	16 1/2	- 3/4	-4.3
O	DATA DIMENSIONS INC	4- 9	5	- 1/4	-4.7
O	DATATAB	1- 2	3/4	- 1/8	-14.2
N	ELECTRONIC DATA SYS.	15- 25	18	-1 5/8	-8.2
O	INSYTE CORP	1- 5	1 1/8	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 3/4	0	0.0
O	KEYDATA CORP	1- 5	1 5/8	0	0.0
A	LOGICON	10- 19	10 5/8	-1	-8.6
A	NATIONAL CSS INC	15- 56	25	-1 7/8	-7.5
O	NATIONAL DATA CORP	7- 15	8 1/8	- 1/2	-5.7
A	ON LINE SYSTEMS INC	12- 50	17 5/8	- 1/8	-0.7
N	PLANNING RESEARCH	4- 10	5 7/8	- 3/4	-11.3
O	PROGRAMMING & SYS	1- 1	1 1/4	- 1/8	-9.0
O	RAPIDATA INC	3- 7	4 1/8	- 1/4	-5.7
O	REYNOLDS & REYNOLDS	18- 36	26 1/2	-1 3/4	-6.1
O	SCIENTIFIC COMPUTERS	3- 9	5 5/8	- 1/8	-2.1
O	TYMSHARE INC	18- 55	24 3/4	- 1/2	-1.9
A	URS SYSTEMS	5- 8	6 3/8	+ 1/4	+4.0
N	WYLY CORP	1- 7	4	- 1/2	-11.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE			
		1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 52	20 1/4	-2 3/4	-11.9
O	ADVANCED MEMORY SYS	7- 18	12	-1 5/8	-11.9
N	AMPEX CORP	10- 19	15	- 1/2	-3.2
O	ANDERSON JACOBSON	5- 10	5 5/8	- 1/8	-2.1
N	APPLIED DIG DATA SYS	9- 22	9 1/4	- 7/8	-8.6
O	BEEHIVE INT'L	3- 7	3 1/8	- 5/8	-16.6
A	BOLT, BERANEK & NEW	6- 14	11 1/2	-1 5/8	-10.6
N	BUNKER-RAMO	10- 20	15	0	0.0
A	CALCOMP	3- 15	5 1/2	- 1/4	-4.5
O	CAMBRIDGE MEMORIES	3- 9	4 1/4	- 3/4	-15.0
N	CENTRONICS DATA COMP	16- 57	22	- 5/8	-2.7
O	COGNITRONICS	1- 4	1 1/2	- 1/2	-25.0
O	COMPUTER COMMUN.	6- 87	5	- 7/8	-14.8
O	COMPUTER CONSOLES	4- 10	7 1/2	- 1/4	-3.2
A	COMPUTER EQUIPMENT	3- 6	3 3/4	- 1/8	-3.2
O	COMPUTER TRANSCEIVER	1- 5	4 1/8	0	0.0
O	COMPUTERVISION CORP	9- 50	21 1/4	0	0.0
O	CONTEN	9- 38	15 1/4	-1 1/4	-8.6
N	CONRAC CORP	15- 26	13 5/8	- 3/8	-4.5
O	DATA ACCESS SYSTEMS	3- 14	10 3/4	- 1/4	-2.2
O	DATA 100	9- 20	19 1/2	0	0.0
A	DATA PRODUCTS CORP	14- 23	16 3/8	-1 1/8	-6.3
O	DATUM INC	2- 6	2 3/8	+ 1/8	+5.0
O	DECISION DATA COMPUT	2- 6	2 1/2	- 1/4	-9.0
O	DELTA DATA SYSTEMS	1- 1	5/8	- 1/8	-16.6
A	DOCUMATION INC	6- 34	20 3/8	-1 5/8	-7.3
O	DATARAM CORP	6- 52	15 1/2	-5	-16.2
N	ELECTRONIC M & M	4- 9	4 1/4	- 1/2	-10.3
O	FABRI-TEK	1- 2	7/8	0	0.0
O	GENERAL COMPUTER SYS	1- 5	2	+ 1/8	+6.6
O	GENERAL DATACOMM IND	9- 21	14	-1	-6.6
N	HAZELTINE CORP	10- 17	11 3/4	+ 1/4	+2.1
N	HARRIS CORP	17- 56	31 1/4	-1	-5.1
O	INFOREX INC	6- 11	6 7/8	- 1/2	-6.7
O	INFORMATION INTL INC	7- 12	6 3/4	+ 1/4	+3.8
O	INFOTON	1- 3	2 3/8	- 3/8	-15.6
O	INTEL CORP	39- 62	47	-2	-4.0
A	LUNDY ELECTRONICS	4- 8	4 1/2	- 1/4	-5.2
O	MSI DATA CORP	10- 19	10 3/4	- 1/4	-2.2
N	MEMOREX	27- 59	28	- 7/8	-5.0
N	MOHAWK DATA SCI	6- 15	8 7/8	- 5/8	-6.5
O	OMEX	2- 6	5 1/2	0	0.0
O	PARADYNE CORP	9- 17	9 3/4	- 5/8	-6.0
O	PENRIL CORP	5- 12	8 1/2	- 1/4	-2.8
M	PERTEC CORP	9- 17	11 1/4	-1 1/4	-10.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	7 7/8	- 1/8	-1.5
O	SCAN DATA	1- 5	1 5/8	- 1/4	-12.8
N	STORAGE TECHNOLOGY	19- 46	29 5/8	- 3/4	-2.4
O	T BAR INC	11- 20	15	-1 1/4	-7.6
O	TALLY CORP.	4- 14	13 3/4	0	0.0
A	TEC INC	6- 15	6 1/2	- 1/2	-7.1
N	TEKTRONIX INC	53- 30	46 3/4	+ 1/2	+1.0
N	TELEX	3- 9	4 3/4	- 3/4	-13.6
O	TESDATA SYSTEMS CR	9- 25	9 1/2	- 3/4	-7.3
O	WILTEK INC	1- 2	1	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE			
		1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	7 5/8	- 1/8	-1.6
O	BALTIMORE BUS FORMS	2- 4	1 1/2	0	0.0
A	BARRY WRIGHT	14- 30	26 5/4	+ 1/4	+0.9
O	CYBERMATICS INC	1- 1	1/2	0	0.0
O	DUPLEX PRODUCTS INC	15- 30	16 1/2	- 5/8	-5.6
M	ENNIS BUS. FORMS	8- 17	12	+ 1/8	+1.0
N	3M COMPANY	43- 66	60	-1 1/8	-1.8
O	MOORE CORP LTD	26- 34	27 1/4	-1	-5.5
N	NASHUA CORP	18- 57	22 1/2	-2 1/8	-8.6
O	STANDARD REGISTER	20- 27	21 1/4	-1 5/4	-7.6
A	TAB PRODUCTS CO	8- 16	9 1/2	- 5/4	-7.5
N	UARCO	19- 50	49	- 1/4	-0.5
A	WABASH MAGNETICS	10- 22	13 5/4	- 5/8	-4.3
N	WALLACE BUS FORMS	18- 33	24 1/4	+ 5/8	+2.6

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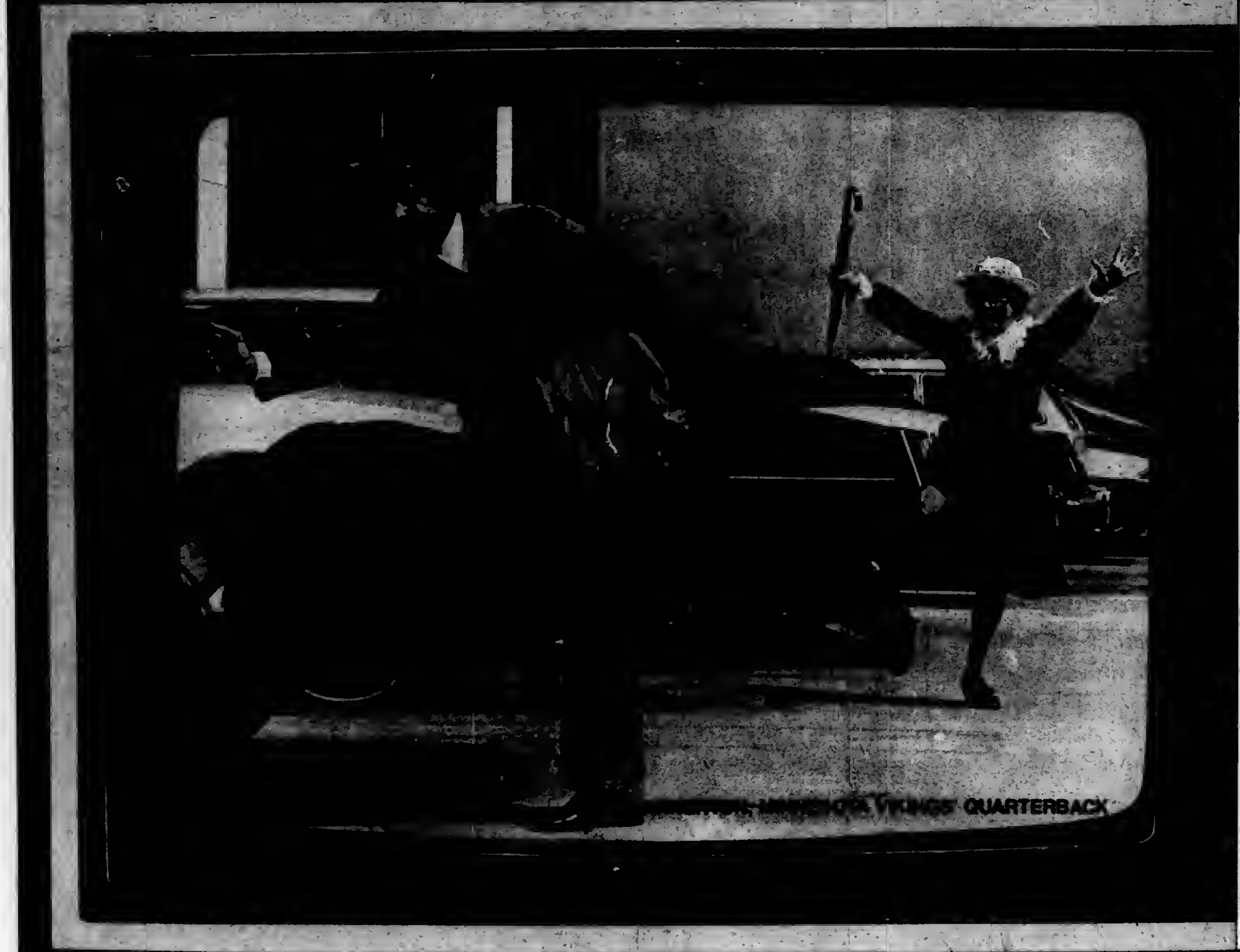

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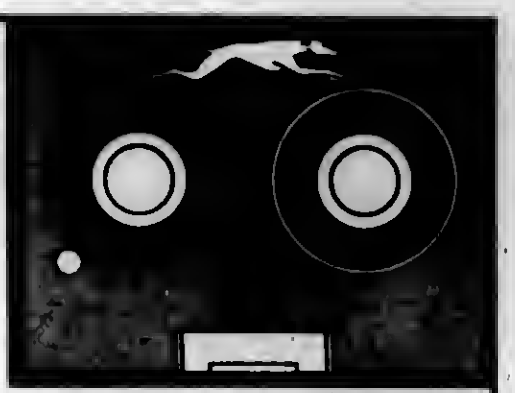

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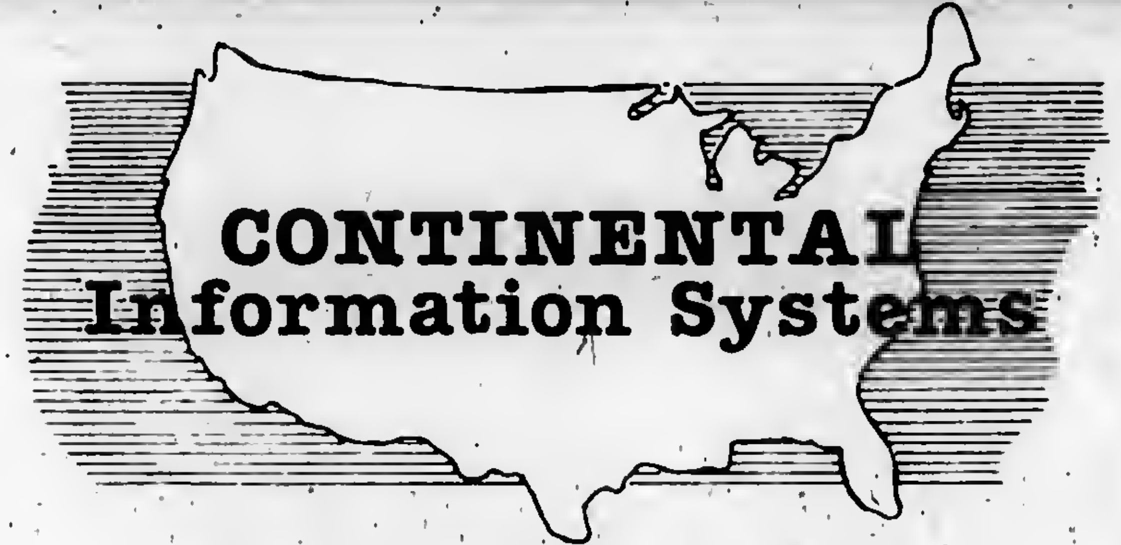

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2821-1	1	Now	34SOLD550	3	Now
2821-2	2	Now	3SOLD1	1	Now
3203-2	1	Now	3SOLD2	1	Now
3271-1	1	Now	3803-1	1	Now
3271-2	86	Now	3803-1/3351, 8100	1	Now
3277-2/4630	4	1/15/79	3811/3211	1	1/15/79
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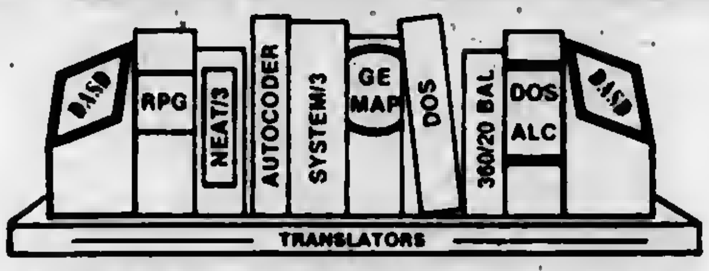

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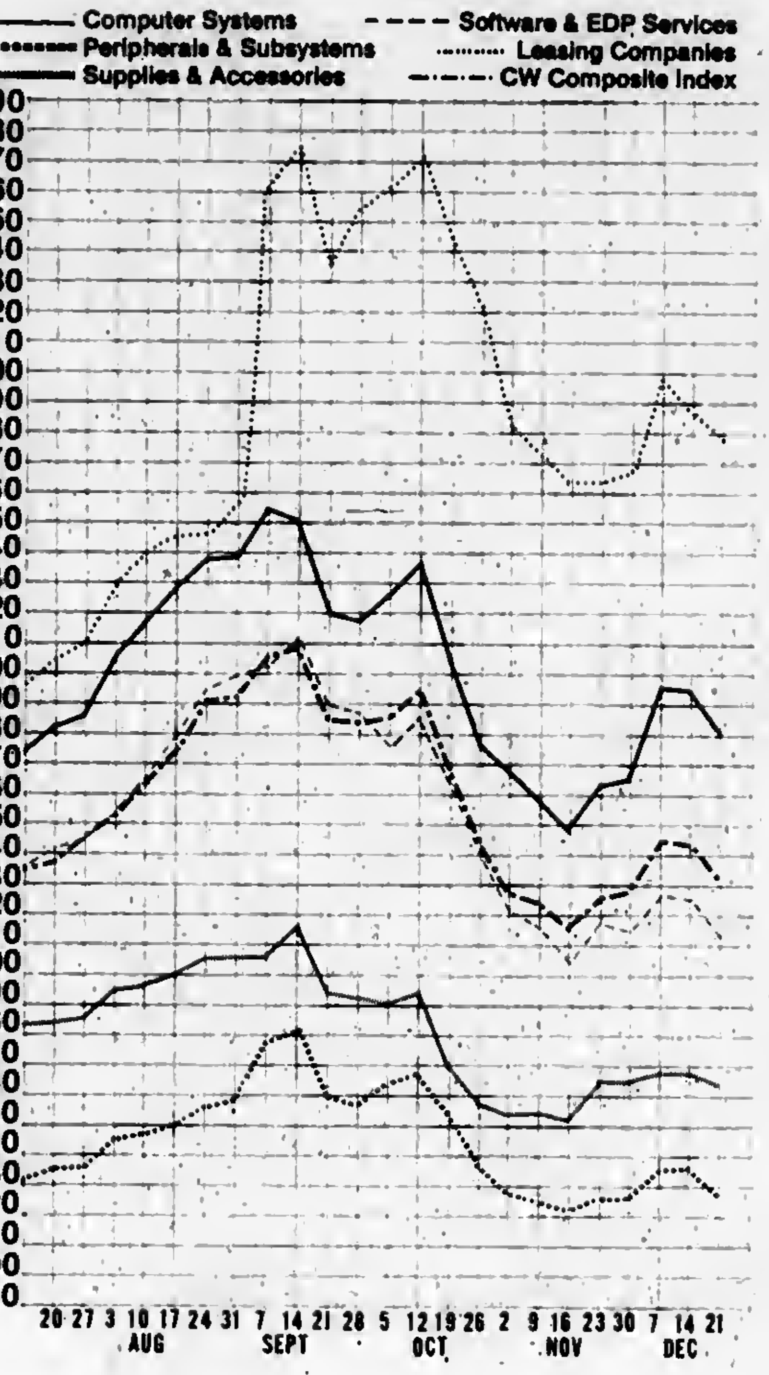

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Tax Cred	97,875	298,200
Earnings	515,337	634,100
3 Mo Shr	.18	.28
Revenue	1,154,367	1,172,199
Earnings	117,355	198,518

MANUFACTURING DATA SYSTEMS

Three Months Ended Nov. 30

	1978	1977
Shr Ernd	$.27	$.20
Revenue	8,972,000	8,017,000
Earnings	622,000	609,000

PENRIL

Three Months Ended Oct. 31

	1978	1977
Shr Ernd	$.18	$.18
Revenue	3,428,503	2,829,465
Earnings	247,684	225,493

PRIME COMPUTER

Three Months Ended Oct. 1

	1978	1977
aShr Ernd	$.40	$.18
Revenue	26,040,000	13,672,000
Earnings	2,310,000	1,052,000
a9 Mo Shr	1.03	.48
Revenue	87,013,000	34,201,000
Earnings	5,936,000	b2,540,000

a-All per-share earnings are adjusted to reflect a May 23, 1978 two-for-one stock split. b-Includes tax-loss carryforward of $150,000.

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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, DECEMBER 19, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP.	28- 69	47 7/8	- 7/8	-1.7
N	BURROUGHS CORP	59- 87	70 7/8	+ 3/8	+0.5
O	COMPUTER AUTOMATION	15- 44	21	-1 1/4	-5.6
N	CONTROL DATA CORP	23- 44	32 3/4	-1 1/8	-3.3
O	CRAY RESEARCH INC	8- 33	29 1/2	-1	-3.2
N	DATA GENERAL CORP	42- 71	58 1/4	-1 3/4	-2.9
N	DATAPOINT CORP	34- 75	67 1/8	+ 7/8	+1.3
N	DIGITAL EQUIPMENT	39- 54	48 5/8	-1 3/8	-2.7
N	ELECTRONIC ASSOC.	2- 13	6	-1	-14.2
A	ELECTRONIC ENGINEER.	9- 19	10 7/8	-1 1/8	-9.3
N	FOUR-PHASE SYSTEMS	19- 46	28	-2 1/2	-8.1
N	FOXBORO	28- 40	30 7/8	-1 3/4	-5.3
O	GENERAL AUTOMATION	7- 26	15 5/8	-1 1/8	-6.7
O	GRI COMPUTER CORP	1- 3	1 1/4	0	0.0
N	HEWLETT-PACKARD CO	62- 93	88	+1 1/8	+1.2
N	HONEYWELL INC	43- 72	66 1/4	- 1/2	-0.7
N	IBM	236-305	282 7/8	+8 5/8	+3.1
O	MANAGEMENT ASSIST	9- 29	16 1/2	-1 5/8	-7.6
O	MANUFACTURING DATA S	9- 23	18	-1 1/8	-5.8
O	MICRODATA CORP	10- 23	17 1/8	-1 1/4	-6.8
O	MINI-COMPUTER SYST	4- 8	5 1/4	- 3/4	-12.5
O	MODULAR COMPUTER SYS	7- 17	13 1/2	-1	-6.8
N	NCR	37- 67	58	-2 7/8	-4.7
N	PRIME COMPUTER INC	20- 43	30	-1 1/2	-4.7
N	PERKIN-ELMER	17- 29	25 7/8	-1 3/8	-5.0
N	SPERRY RAND	33- 49	42	-1 3/8	-3.1
A	SYSTEMS ENG. LABS	11- 24	13 3/8	-1	-6.9
O	TANDEM COMPUTERS INC	13- 37	22 1/4	-2	-8.2
A	WANG LABS.	12- 32	28 3/8	- 3/8	-1.3

LEASING COMPANIES

EXCH		PRICE 1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	13- 21	21	- 1/4	-1.1
O	COMDISCO INC	5- 22	13 3/4	-1	-6.7
A	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	2 5/8	- 1/8	-4.5
C	CONTINENTAL INFO SYS	5- 15	6 1/2	- 3/4	-10.3
N	DATRONIC RENTAL	1- 3	2 1/4	+ 1/4	+12.5
A	DCL INC	3- 5	4 3/8	0	0.0
N	DPF INC	8- 14	10	-1	-9.0
N	ITEL	16- 35	25 3/8	- 1/8	-0.4
N	LEASCO CORP	24- 36	33 1/8	-1 7/8	-5.3
O	LEASPAC CORP	1- 4	2 3/4	- 1/8	-4.5
A	PIONEER TEX CORP	3- 7	3 1/8	0	0.0
N	U.S. LEASING	13- 20	14 1/2	-1	-6.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	7/8	- 1/8	-12.5
O	ANACOMP INC	8- 22	11 1/8	- 5/8	-5.3
A	APPLIED DATA RES.	8- 17	10 1/2	- 1/2	-4.5
N	AUTOMATIC DATA PROC	24- 36	29 1/2	-1 1/2	-4.8
O	COLEMAN AMERICAN COS	1- 2	5/8	0	0.0
O	COMPU-SERV NETWORK	6- 12	5 1/2	- 1/4	-4.5
O	COMPUTER HORIZONS	1- 9	6 1/4	- 3/4	-10.7
O	COMPUTER NETWORK	6- 16	6	- 5/8	-9.4
N	COMPUTER SCIENCES	8- 17	10 5/8	- 3/4	-6.5
O	COMPUTER TASK GROUP	1- 4	4 1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 5/8	- 1/8	-5.0
O	COMPUT AUTO REP SVC	4- 10	6 1/8	- 1/8	-2.0
O	COMSHARE	6- 19	14	-1 1/4	-8.1
O	CULLINANE CORP	14- 53	16 1/2	- 3/4	-4.3
O	DATA DIMENSIONS INC	4- 9	5	- 1/4	-4.7
O	DATATAB	1- 2	3/4	- 1/8	-14.2
N	ELECTRONIC DATA SYS.	15- 25	18	-1 5/8	-8.2
O	INSYTE CORP	1- 3	1 1/8	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 3/4	0	0.0
O	KEYDATA CORP	1- 3	1 5/8	0	0.0
A	LOGICON	10- 19	10 5/8	-1	-8.6
A	NATIONAL CSS INC	15- 36	23	-1 7/8	-7.5
O	NATIONAL DATA CORP	7- 13	8 1/8	- 1/2	-6.7
A	ON LINE SYSTEMS INC	12- 30	17 5/8	- 1/8	-0.7
N	PLANNING RESEARCH	4- 10	5 7/8	- 3/4	-11.5
O	PROGRAMMING & SYS.	1- 1	1 1/4	- 1/8	-9.0
O	RAPIDATA INC	3- 7	4 1/8	- 1/4	-5.7
O	REYNOLDS & REYNOLDS	18- 36	26 1/2	-1 3/4	-6.1
O	SCIENTIFIC COMPUTERS	3- 9	5 5/8	- 1/8	-2.1
O	TYMSHARE INC	18- 53	24 3/4	- 1/2	-1.9
A	URS SYSTEMS	5- 8	6 3/8	+ 1/4	+4.0
N	WYLY CORP	1- 7	4	- 1/2	-11.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	20 1/4	-2 3/4	-11.9
O	ADVANCED MEMORY SYS	7- 18	12	-1 5/8	-11.9
N	AMPEX CORP	10- 19	15	- 1/2	-3.2
O	ANDERSON JACOBSON	5- 10	5 5/8	- 1/8	-2.1
N	APPLIED DIG DATA SYS	9- 22	9 1/4	- 7/8	-8.6
O	BEEHIVE INT'L	3- 7	5 1/8	- 5/8	-16.6
A	BOLT,BERANEK & NEW	6- 14	11 1/2	-1 5/8	-10.6
N	BUNKER-RAMO	10- 20	15	0	0.0
A	CALCOMP	3- 13	5 1/2	- 1/4	-4.5
O	CAMBRIDGE MEMORIES	3- 9	4 1/4	- 3/4	-15.0
N	CENTRONICS DATA COMP	16- 57	22	- 5/8	-2.7
O	COGNITRONICS	1- 4	1 1/2	- 1/2	-25.0
O	COMPUTER COMMUN.	6- 87	5	- 7/8	-14.8
O	COMPUTER CONSOLES	4- 10	7 1/2	- 1/4	-3.2
A	COMPUTER EQUIPMENT	3- 6	5 3/4	- 1/8	-5.2
O	COMPUTER TRANSCEIVER	1- 3	4 1/8	0	0.0
O	COMPUTERVISION CORP	9- 30	21 1/4	0	0.0
O	COMTEN	9- 38	15 1/4	-1 1/4	-8.6
N	CONRAC CORP	13- 26	13 5/8	- 5/8	-4.3
O	DATA ACCESS SYSTEMS	3- 14	10 3/4	- 1/4	-2.2
O	DATA 100	9- 20	19 1/2	0	0.0
A	DATA PRODUCTS CORP	14- 25	16 5/8	-1 1/8	-6.5
O	DATUM INC	2- 6	2 5/8	+ 1/8	+5.0
O	DECISION DATA COMPUT	2- 6	2 1/2	- 1/4	-9.0
O	DELTA DATA SYSTEMS	1- 1	5/8	- 1/8	-16.6
A	DOCUMATION INC	6- 34	20 5/8	-1 5/8	-7.5
O	DATARAM CORP	6- 32	15 1/2	-5	-16.2
N	ELECTRONIC M & M	4- 9	4 1/4	- 1/2	-10.5
O	FABRI-TEK	1- 2	7/8	0	0.0
O	GENERAL COMPUTER SYS	1- 3	2	+ 1/8	+6.6
O	GENERAL DATACOMM IND	9- 21	14	-1	-6.6
N	HAZELTINE CORP	10- 17	11 3/4	+ 1/4	+2.1
N	HARRIS CORP	17- 56	31 1/4	-1	-3.1
O	INFOREX INC	6- 11	6 7/8	- 1/2	-6.7
O	INFORMATION INTL INC	7- 12	6 3/4	+ 1/4	+5.8
O	INFOTON	1- 3	2 3/8	- 3/8	-13.6
O	INTEL CORP	39- 62	47	-2	-4.0
A	LUNDY ELECTRONICS	4- 8	4 1/2	- 1/4	-5.2
O	MSI DATA CORP	10- 19	10 3/4	- 1/4	-2.2
N	MEMOREX	27- 59	28	- 7/8	-3.0
N	MOHAWK DATA SCI	6- 15	8 7/8	- 5/8	-6.5
O	OMEX	2- 6	5 1/2	0	0.0
O	PARADYNE CORP	9- 17	9 3/4	- 5/8	-6.0
O	PENRIL CORP	5- 12	8 1/2	- 1/4	-2.8
N	PERTEC CORP	9- 17	11 1/4	-1 1/4	-10.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	7 7/8	- 1/8	-1.5
O	SCAN DATA	1- 5	1 5/8	- 1/4	-12.8
N	STORAGE TECHNOLOGY	19- 46	29 5/8	- 3/4	-2.4
O	T BAR INC	11- 20	15	-1 1/4	-7.6
O	TALLY CORP.	4- 14	15 3/4	0	0.0
A	TEC INC	6- 15	6 1/2	- 1/2	-7.1
N	TEKTRONIX INC	33- 50	46 3/4	+ 1/2	+1.0
N	TELEX	3- 9	4 3/4	- 3/4	-13.6
O	TESDATA SYSTEMS CP	9- 23	9 1/2	- 3/4	-7.3
O	WILTEK INC	1- 2	1	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	7 5/8	- 1/8	-1.6
O	BALTIMORE BUS FORMS	2- 4	1 1/2	0	0.0
A	BARRY WRIGHT	14- 30	26 3/4	+ 1/4	+0.9
O	CYBERNATICS INC	1- 1	1/2	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	16 1/2	- 5/8	-3.6
N	ENNIS BUS. FORMS	8- 17	12	+ 1/8	+1.0
N	3M COMPANY	43- 66	60	-1 1/8	-1.8
O	MOORE CORP LTD	26- 34	27 1/4	-1	-3.5
N	NASHUA CORP	18- 37	22 1/2	-2 1/8	-8.6
O	STANDARD REGISTER	20- 27	21 1/4	-1 3/4	-7.6
A	TAB PRODUCTS CO	8- 16	9 1/2	- 3/4	-7.3
N	UARCO	19- 50	49	- 1/4	-0.5
A	WABASH MAGNETICS	10- 22	13 3/4	- 5/8	-4.3
N	WALLACE BUS FORMS	18- 53	24 1/4	+ 5/8	+2.6

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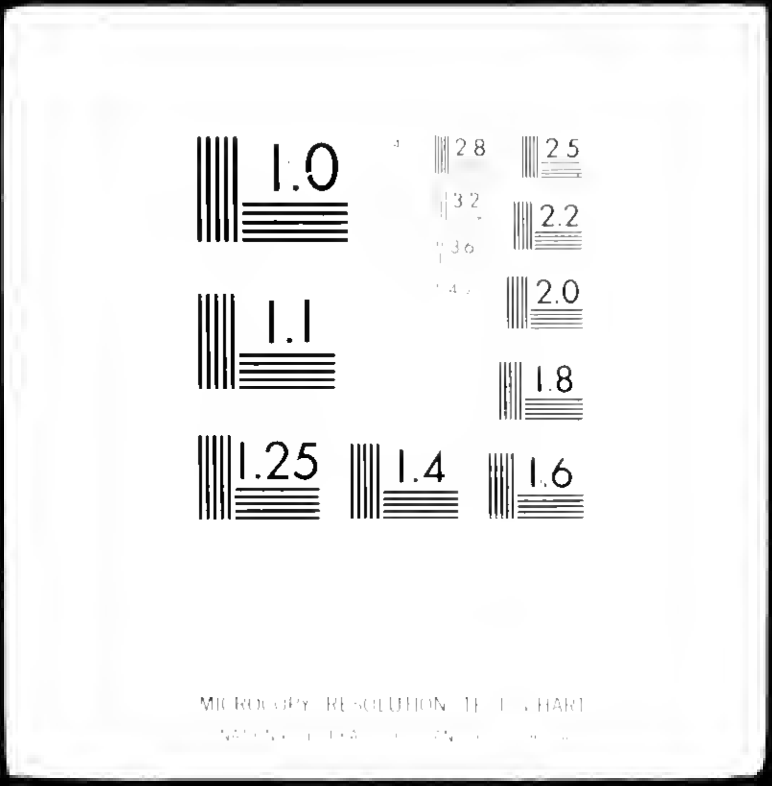
RESOLUTION CHART



100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and 100 ÷ 20 = 5.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and 7.9 x 5 = 39.5 lines per millimeter recorded satisfactorily. 10.0 x 5 = 50 lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.

THE END

SEPT

Macy's

Merchandise Advertised Here On Sale Tuesday—Store Closed All Day To-morrow (Labor Day)

Macy's

R. H. Macy & Co.

Herald Square Inc. New York

Long Cloth $1.88 piece of ten yards

Our own "Intratex" Doeskin finish, medium weight long cloth. This is the most practical material for fine underwear, since it wears well and washes well. 36 inches wide.

Macy's—White Goods Department, Second Floor, Center

Macy's Marquise Brand

Cap Shape Hair Nets 79c doz.

Our Usual Price Would Be 94c

Every net guaranteed perfect. All colors except white and gray.

Macy's—Main Floor, 34th Street, Rear

YOU SAVE AS YOU BUY AT MACY'S

Which accounts for the popularity of this store. Our patrons demand merchandise of quality and they find it here, saving on every purchase.

Because Our Merchandise Is Bought For Cash In Large Quantities And Sold For Cash At Lowest-in-the-City Prices.

498 Sleeveless Corduroy Dresses

In The House Dress Section

$4.69

Something entirely new—attractive and practical sleeveless dresses which are warmer than cottons and launder just as well.

Made of good quality wide wale corduroy with smart tailored bindings of silk braid finishing neck, armholes and pockets.

In charming shades of Copenhagen, Orchid, Wistaria, Rose, Bluebird, Brown, Navy and Black.

Sizes 36 to 44.

Macy's—Third Floor, Center

Women's Petticoats and Pantalettes

Petticoats $2.79

A straight line petticoat, with a hemstitched hem, made of messaline. In black, navy, brown, taupe, peacock with cerise, green with cerise.

Silk Jersey Pantalettes $3.74

The cuff is finished with a double elastic. In all the new Fall colors.

Extra Size Petticoats $3.74

Good quality taffeta, with a prettily corded flounce. Black and colors.

Macy's—Third Floor, Center

SCHOOL SUPPLIES

are an all important item just now. This sale includes supplies for the proud little first grader, as well as for the wise old college senior—at prices which will prove a joy to Father, who has so many expenses connected with the opening of school.

Tablets

Packet size, 98 sheets of pencil paper, 3c

Ruled white paper with fancy cover, 29c dozen

Good quality tablet, 9c

86 leaves packet size

Many other styles and sizes of tablets at various prices.

Composition Books

Size 6⅝x8¾, with 24 leaves, 4c each

High School books, 7c and 9c each

Stiff covers, with good quality paper, 72 leaves, 12c each

Loose Leaf Note Covers

Complete with fillers, various sizes from 34c to 47c

Ink Pencils, without clip 94c

With clip, $1.14 each, tax additional

Fountain Pens, tax additional, $1.98

Short size with ring or clip, or long size with clip only, all self-fillers, with 14 karat gold pen points.

Sta-Sharp Pencils $1.49 each

Sterling silver or gold filled, short with ring, or long with clip, tax additional.

Boston Pencil Sharpeners, 69c each

School Bags

Our assortment of these useful bags is so large and varied that we can mention only a few of the more interesting values:

Waterproof Bag with strap, 69c

Portfolio style with handle or strap, $1.49

Plaid, with handle or strap, $2.49

Genuine leather, portfolio style with handle and lock, $4.69

Rope Bags, with or without linings, plain and assorted colors, 23c to 89c each

Rubber Bands 9c box

Assorted sizes in a box.

Lunch Boxes and Kits

Folding lunch boxes, 23c and 39c

Lunch kits with places for vacuum bottles, $1.19

Slates 12c to 79c

In all the popular sizes, with plain or felt trimmed frames. Single and double.

Lead Pencils, with erasers 19c dozen

With metal tips and erasers, 29c doz.

This is only one item in a vast assortment of pencils and erasers.

Macy's—Main Floor, 35th Street, Rear

Slate Pencils 6c dozen and 3c each

Book Covers 6c and 9c each

A new kind of book cover, made in regulation sizes and assorted colors.

Pencil Sets 19c each

Set consists of a box containing four pencils, 1 pen holder and pen, and 1 eraser.

Other sets at 34c each

Drinking Cup Sets 69c each

Box contains 2 rubber tipped pencils, 1 red and blue crayon, 1 cork tipped penholder, 1 10-inch ruler and 1 aluminum drinking cup.

Library Sets $1.09

The set comes in a fancy box which looks just like a book, and consists of 9 pencils, 1 red and blue combined pencil, 1 rubber tipped penholder, 1 eraser, pen points and rubber bands.

Leather Cases 47c each

The cases contain 4 pencils and 1 penholder, with a small compartment for change or stamps.

For Jaded Wardrobes We Prescribe

Four Canton Crepe Frocks for Misses

(Embodying the Style Points for Autumn)

$23.74

Plaited panels of Canton crepe deserve the credit for the individuality of these smartly simple frocks. In one model, illustrated, they hang from the yoke, in another they form fluttering side panels. A third has pleats, but this time of narrow moire ribbon, while the fourth borrows originality from a shoulder cape of Georgette, braid trimmed.

Colors are Navy and Black.

Sizes: 14, 16, 18.

Macy's—Third Floor, 35th Street, Front

Colored Wash Goods

Specially Priced

Imported and Domestic Gingham 69c yd.

Good quality gingham in both check and plaid patterns. 31 inches wide.

Aeroplane Linen 49c yd.

Natural color linen, suitable for dresses, smocks and school clothes. 36 inches wide.

Dress Gingham 24c yd.

A serviceable quality gingham in checks and plaid patterns. Desirable for house and porch dresses, as well as aprons. 31 inches wide.

Macy's—Second Floor, Center Front

More School Shoes For Boys and Girls $2.49 Pair

3,000 Pairs—All Lace Styles

For Boys

Wide Widths Only

Black and Tan

Sizes: 9 to 13½; Youths' 1 to 2; Boys' 2½ to 6.

Macy's—Special Children's Shoe Section, Fourth Floor, Center.

Solve Your Children's Shoe Problem At Unusual Savings

For Girls

Wide Widths Only

Sizes: Child's 8 to 11; Misses' 11½ to 2; Tan only

Macy's—Special Children's Shoe Section, Fourth Floor, Center

All Silk

OBREGON'S MESSAGE SHOWS DEBT FEELER

Text of Address to Congress Reveals Invitation to Speyer and Co. for Conference.

CONFIDENT OF RECOGNITION

Professes Highest Regard for American Interests Despite His Rejection of Treaty.

Special to The New York Times.

WASHINGTON, Sept. 3.—The Mexican Embassy at Washington late tonight delivered to THE NEW YORK TIMES the full text of the message which Alvaro Obregon, President of Mexico, presented yesterday to the Mexican Congress, in which he went thoroughly into the international situation and especially into the relations between Mexico and the United States.

The text throws much light upon President Obregon's views, of which only a brief extract was cabled from Mexico City at the time.

An important statement in the Obregon message is his assertion that almost immediately after his Government had come into power it formally invited through the Department of Foreign Relations the banking house of Speyer & Co. of New York and the International Committee, of which Thomas W. Lamont of Morgan & Co. is President, to come to Mexico to settle with the Mexican Government the pending questions relative to the foreign debt.

Although General Obregon does not say so in his message, there is warrant for the statement that Mr. Lamont will now soon go to Mexico City in response to this invitation. Information reached Washington several days ago that Mr. Lamont was going to Mexico City on a special mission, and it was brought informally to the attention of high officials of the State Department. At the department the statement was made that Mr. Lamont was not going to Mexico on any official mission for the United States Government, but it was considered quite likely that he was going there in some sort of banking capacity.

Considered in the light of all that has happened in the past, events appear to be moving rather rapidly in the Mexican situation toward a solution of the real points at issue. Those most familiar with the intricacies, as well as the history of the problem, believe that what has been taking place in the last few weeks, especially in the last week, is leading rapidly toward the point where recognition will come, and that it will now, barring hitches, be largely a matter of details and diplomatic working out of an understanding.

Text of Obregon Message.

Here is the full text of General Obregon's message on foreign relations as given to THE NEW YORK TIMES by the Mexican Embassy at 11:30 o'clock tonight, immediately after it had been cabled to the Embassy from the Mexican Foreign Office:

"Our International Situation: This subject has aroused all kinds of commentaries during the present time. It is quite apparent that one of the great difficulties with which we are confronted is a result of the abnormal relations existing between our country and the United States, responsible for the attitude of aloofness of several countries, although others more justly have pretended to follow the course prescribed by international law which provides no other way than that a government shall be recognized which has been elected by the people of a friendly nation in accordance with its laws.

"The countries which have officially recognized the present administration of Mexico are, in the Americas: Argentina, Brazil, Bolivia, Colombia, Costa Rica, Chile, San Salvador, Ecuador, Guatemala, Honduras, Nicaragra, Panama, Peru, Uruguay, Paraguay and Venezuela. In Europe: Germany, Austria, Spain, The Netherlands, Italy, and Sweden; and in Asia, China and Japan. France replied in accordance with international practice to the autograph leter of the President in which he communicated his election as chief magistrate and the French legation in Mexico, in charge of His Excellency Victor Ayguesparssee, Chargé d'Affaires, as well as our legation in Paris, also in charge of a chargé d'Affaires ad interim, have continued to carry on diplomatic intercourse as usual.

"Nevertheless, no agreement has been reached so far whereby plenipotentiary Ministers might be appointed, neither has France designated any diplomatic representatives to represent her at our Centennial festivities. Switzerland replied to the autograph letter of my predecessor, who sent a Minister to Berne, but as this Minister was not received, the present Administration had him recalled and since then diplomatic relations have been considered interrupted between that country and ours.

Separate Representations.

"In order to promote a closer understanding with those countries which are friendly to Mexico, the Government deemed it advisable to separate the representations accredited in several countries at the same time and applied a diplomatic agent to each one of them; thus instead of having a plenipotentiary minister sent to Venezuela, Colombia and Ecuador, a resident minister in Peru and Bolivia, and another in Nicaragua and Costa Rica, a minister wil now be sent to each one of the countries above referred to.

"Likewise a plenipotentiary minister will be appointed to Holland aside from our diplomatic representative in Belgium, as the former country has decided to establish a legation in Mexico and it is our duty to reciprocate in a due friendly form; and inasmuch as Sweden has likewise promoted the rank of its diplomatic relation in Mexico, this Government will also establish a legation in that country, which will be independent of the one in Norway.

"Mexico, on the other hand, has been requested to accord recognition to the Governments of the following countries: Poland, Finland, Austria, Czechoslovakia, the Georgian Republic, the United Kingdom of the Transcaucasus, Vitanvalia of Malkop and Tergahsma. Recognition has been granted by Mexico to the first five mentioned countries and further information has been requested regarding the latter in order to determine what course shall be pursued. Several friendly nations have sent special missions and special representatives to Mexico at the Presidential inauguration.

"The following representatives were especially designated: His Excellency Dr. Manuel E. Malbran, as Ambassador Extraordinary and Plenipotentiary of the Republic of Argentina; His Excellency Alberto Yoachan Varas, as envoy Extraordinary and Minister Plenipotentiary of Chile; His Excellency Dr. Pedro Erasmo Callaorda, as Envoy Extraordinary and Minister Plenipotentiary of Uruguay; His Excellency Rafael Tinoco as Envoy Extraordinary and Minister Plenipotentiary of Guatemala; Señor Eudoro Urdaneta as Special Delegate of Salvador and Señor Otto Reimbeck as Delegate of Honduras.

Reports Cordial Relations.

"In mentioning the special representatives who have been sent to Mexico by Latin-American countries, it is opportune to inform that every-day relations between our country and those republics are becoming more cordial, and it is pertinent to recall likewise, among other tokens of friendship accorded to Mexico, the attitude observed by the Argentine Republic and Uruguay at the time of the death of Jesus Urueta, our Extraordinary Envoy and Plenipotentiary Minister, which occurred at Buenos Aires, in December, 1920. Both countries accorded the illustrious deceased every honor, having been supported by public sentiment for which the Mexican Government and the Mexican people were profoundly grateful.

"On our part this Government has appointed the following special representatives: Dr. Enrique Gonzalez Martinez, Minister Plenipotentiary of Mexico to Chile, who was a special representative of our Government in November, 1920, at the time of the special festivities organized by the Chilean Government in celebration of the fourth centennial of the discovery of the Magellan Straits and who likewise represented our Government on Dec. 23 at the ceremonies which took place when the Government of that country changed hands.

"Juan B. Delgado was sent to the Central American Republics to offer the thanks of our Government for the special missions designated to be present at the inauguration of the actual Chief Executive of our country. Mr. Delgado was the recipient of numerous manifestations of good will which testify to the cordial relations existing between those countries and our own.

"Antonio Caso was appointed Ambassador Extraordinary to the centennial festivities which were organized to celebrate the independence of Peru and likewise cordially and enthusiastically received. Mr. Caso was also commissioned to extend the thanks of the Mexican people to the Governments of Chile and Argentina for having sent special representatives to the inauguration of the Chief Executive.

"In view of the celebrations of the coming festivities to celebrate the centennial of the consummation of our independence, a number of foreign Governments have designated special representatives to take part in these festivities, some of them rather significant, as they are headed by high officials of their respective Governments. In connection therewith duly accredited Ambassadors have been appointed by the following countries: Germany, Argentina, Brazil, Colombia, Chile, Spain, San Salvador, Panama, Peru and Uruguay; and Minister Plenipotentiory and Delegates by the following nations: Bolivia, Costa Rica, China, Guatemala, Holland, Honduras, Italy, Japan, Nicaragua and Venezuela.

Discusses Relations With Us.

"Our Relations With the United States—Since the beginning of the present Presidential term, and before judgment could be passed on this Government's capacity, taking its acts as basis for such judgment to carry out the program outlined during the electoral campaign, the American State Department believed that the interests of Americans in Mexico should be guarded by a treaty to be concluded before diplomatic relations between both countries could be resumed:

"Later it was announced that recognition of Mexico by the United States was assured if this plan was followed and to this end the United States proposed, informally, a treaty of amity and commerce. The proposed treaty contained stipulations contrary to several of our constitutional precepts; its acceptance therefore would have led inevitably to create a situation whereby Americans resident in Mexico would have been grantd greater privileges than any other foreigners in this country, and automatically, the same privileges would have to be extended to the citizens of other countries according to the treaty clause of 'the most favored nation,' that is to say, such a procedure, unless we changed our constitution according to the demands of a foreign power, might lead to the granting of unjustified privileges to Americans in Mexico or, generally speaking, granting privileges to a special group of foreigners to the exclusion of all others, and what is worse yet, to the detriment of the Mexicans themselves.

"Presuming all this was not the case as it was simply a case of submitting to consideration of our Government a project, and that Washington, according to later indications, does not intend to insist on any stipulations contrary to our laws, the Mexican Government does not deem it possible nor convenient or necessary to sign such a treaty under such conditions.

"Considering what the signing of such a treaty might implicate or signify at the same time, the resumption of diplomatic relations between the two countries would have given recognition a conditional character and seriously impaired the sovereignty of Mexico.

"It is a fact that this is a State, the existsence and sovereignty of which has never been questioned for more than a hundred years, and its government, as a consequence, is entitled to be recognized by the Governments of other countries in accord with established rules, that is, without any other conditions being imposed but that it shall be legal and able to comply with its international obligations; hence the demand that the *Executive of Mexico should enter into* any other agreements prior to recognition would not be justified by international laws.

"Aside from this legal point there seems to be no justification for such a demand inasmuch as it is quite unnecessary, even to those interests that it was intended to protect, if it be taken in consideration that the Chief Executive of the Government first as a candidate and later as Executive, declared repeatedly that his policy would always conform to the law and moral principles.

"There is abundant evidence of its ability to develop the policy and of the support given him by the legislative and judicial branches, proofs which have been duly considered by all the Governments of Europe, of the Americas, and Asia, which have not hesitated to renew diplomatic relations with Mexico, not to mention, among all such proofs, only ones most directly related to the interests of foreigners in Mexico to the total pacification of the Republic and its rapid administrative and financial reorganization, it will suffice to add, for instance, the return of the banks of issue to their owners and of many other private properties formerly managed by the previous administration which was recognized by the Government of the United States.

"In order to confine these proofs to what regards American interests only it should be remembered first that almost immediately after the present Government had come into power, it invited informally and through the Department of Foreign Relations the banking house of Speyer & Co. of New York and the International Committee of Bankers, of which Mr. Lamont is President, to come to Mexico to settle with the Government the pending questions relative to our exterior debt as soon as they desired; secondly, in spite of the fact that there exists a National Claims Commission, which has been established to investigate and pass on all claims presented for damages caused during the revolution, and although citizens of Austria, Cuba, China, France, England and Italy have presented claims through diplomatic channels, and these claims have augmented considerably from January of this year.

"That is, when the amendments to the corresponding—laws were already in force, which went to prove the facts it is oportune to bear in mind that there have been cases such as that of Wong Wing, Chinese citizen who left it to the committee to determine the value of the damages suffered by him, and that of a Spaniard named Alvaro Caleja, who disinterestedly renounced all rights to a claim for damages which he believed reached the sum of $272,000 pesos, and, in spite of all them, again the present Government, in its desire to more liberally satisfy the just demands of these foreigners who have met with losses and in accord with Article 5 of the decree issued May 10, 1913, and amended Article 13, of the law enacted Dec. 24, 1917, incited the foreign Governments, in order that, in accord with the Mexican Government, they should proceed to celebrate conventions to establish a mixed commission which would permanently be charged with passing judgment of the claims of their citizens.

"And lastly, inasmuch as the non-retroactivity of Article XXVII of the Constitution with regard to privately-owned petroleum properties, has been recently defined by decisions of the Supreme Court of the nation, the spirit of which is found to be in full accord with various declarations and statements of the executive and of some of the members and grups of this congress, it not being hazardous to suppose that they constitute a majority, thus setting an example of Governmental solidarity which plainly guarantees the future regulations and applicable of Article XXVII in full subordination to the people of non-retroactivity.

"Therefore, the three qustions which principally affect the foreigner's rights in Mexico, to wit: the resumption of the payment of the public debt, the equitable reparation for damages incurred during the revolution as a result of impartial findings of mixed commissions, and the non-retroactive interpretation of Article 27, may be considered already solved, by the simple and voluntary execution of the program of the Government of Mexico, resulting, therefore, as above stated, that it is not only unnecessary to incorporate them in a treaty with a foreign government, but also undignified, inasmuch as, on the one hand, diplomatic relations are in suspense, and, on the other, an international treaty would deprive the acts of our Government of its uncontroversy spontaneousness.

Professes Concern for Us.

"In other words, and summing up, our Government is as much preoccupied with protection of the interests of Americans in Mexico as the Government of the United States, as it considers such protection one of its most imperious obligations to that great country, not only because of its material bonds on account of its neighborhood, but also because of the greater moral ones, of our sympathy for its democratic instructions and the high qualities of its people.

"Both Governments, therefore, are in accord on this purpose and the Mexican Government, with the object of co-operating more efficiently to its realization, that it may take a stand which will strengthen the prestige of said Government, enabling it best to fulfill its obligations of protection and might cause at the same time the bringing about of closer future relations between the two countries, has preferred to eliminate any chance of making promises which might humiliate it, through the natural carrying out of its political and administrative plans, and intends to follow this course until it believes the way sufficiently free of obstacles, in order to be recognized without prejudicing its dignity and national sovereignty, and, later, to be able, under equal conditions, to negotiate and enter into as many treaties as it believes necessary to insure the friendship of renewed diplomatic relations.

"It is satisfactory to point out the fact that the acts of Mexican Government, carried out according to the precepts of morals and law, has met with a response on the other side of the Rio Grande, and as a consequence the friendship between the American and the Mexican peoples seems to be growing closer.

"There is a greater exchange of ideas and mutual sympathy.

"During the past few months Mexico has been visited by several groups of excursionists from Houston, El Paso, San Antonio, Dallas, Waco and Laredo, of the State of Texas, and from California delegations have com efrom San Francisco, Los Angeles and San Diego. The State of Arizona has also sent excursionists from Tucson and Nogales, and there have also been visitors from St. Louis, Mo., New Orleans, Boston and Philadelphia.

"It is well to note also, as it throws more light on the true attitude of the American people on this matter, that in in order to end the abnormal situation existing in the diplomatic relations between the United States and Mexico, the Legislatures of the various States of the Union have recommended to the White House the recognition of our Government and these official requests have brought about a great deal of private petitions, as wel as those sent by chambers of commerce and other institutions.

"These facts, which have awakened in the Government of Mexico sentiments of profound gratitude, would indicate that the time is not far off when the just spirit, and the fine sentiments of the American people will finally succeed and be the cause that Mexico will be treated as she deserves, in order that it may realise free of all international encumbrance, her hopes of working conscientiously, and in perfect harmony, with other countries for her own welfare and for the greatest good of humanity."

General L. W. Pettebone Dies.

NIAGARA FALLS, N. Y., Sept. 3.—General Lauren W. Pettebone, commander of the Fourth Brigade, New York National Guard, from 1894 to 1900, died tonight at his home here. He was the organizer and President of the Cataract Paper Company and was one of the pioneers in the industrial development of Niagara Falls. General Pettebone was born at Lockport, N. Y., 74 years ago. He belonged to the Army and Navy, Buffalo and Niagara Clubs.

AMERICANS REACH ACCORD IN MEXICO

Continued from Page 1, Column 5.

riss, Chairman of the Board of the National Association for the Protection of American Rights in Mexico. Mr. Watriss represents the interests of John Hays Hammond and Harry Payne Whitney, as well as the interests of the International Petroleum Company and the Seaboard Oil Company.

In discussing the situation yesterday Mr. Watriss pointed out the difference between the Mexican laws and our own laws.

"Mexico's laws," it was explained "are based upon the Roman law—the civil law; our laws are founded upon the old common law of England. Our courts are governed by precedent. Once the Supreme Court of the United States has reached a decision, it seldom, if ever, reverses itself. It observes that precedent. In Mexico, under the civil law, a decision of the Supreme Court applies to a particular case. It may, and often does, in effect, reverse itself the following month.

"The recent decision of the Supreme Court of Mexico," continued Mr. Watriss, "in a proceeding brought by the Texas Oil Company to settle a question of title arising out of the action of the Carranza Government and based on a decree issued by Carranza in aid of certain provisions of Article 27 of the Constitution, cannot in my opinion settle any of the questions pending between the Mexican Government and American owners of property in Mexico, except the question immediately involved in this particular case. If the decision has been correctly quoted, it does nothing more than decide that Article 27 in this case cannot be applied retroactively so as to deprive the Texas Company of title to certain property rights acquired prior to May 1, 1917. This does not establish a fixed principle which cannot be reversed, as would be the case with our Supreme Court decision, and thus our people generally are under a misapprehension. When the Mexican press asserts that the principle of retroactivity has been settled in this decision, they know this cannot be true, but they know that the American people, and they hope that the American Government, may be misled by a subterfuge and gather an altogether erroneous impression by comparison with our own Supreme Court procedure.

"These are facts which Secretary Hughes no doubt had in mind when he suggested that the only means which would serve as protection to the many thousands of American citizens whose property or whose investment lies in Mexico would be the joint signature of a suitable treaty protecting the rights of the citizens of either country when in the territory of the other. So far as I can see, nothing short of such a treaty covering all the points at issue can bring about an adjustment between these two countries that would protect the American in Mexico as we today protect the Mexican in the United States. Any act of the Mexican Congress might be superseded by a subsequent act. A decision of the Supreme Court, as we have seen, may be readily reversed. Nothing short of a treaty can take care of the long-abused rights of Americans, as our State Department has so clearly and forcibly pointed out."

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Correct Apparel for Women & Misses

With the Close of Summertime, We Open the Fall Season with a Glorious Ensemble of

AUTUMN FASHIONS

WHICH BESPEAK VERY LENGTHY STORIES:
SMART, NEW LONGER SKIRTS, LOWER WAIST-LINES AND NOVEL LONG, WIDE SLEEVES.

Prices are Very Moderate

Black, Navy Blue, Malay Brown, Marmot Gray, Sorrento Blue, Volnay Red.

Dresses & Gowns

From the Great Parisian and American Couturieres

39.50 to 225.00

Creations of irresistible beauty and smartness are these fascinating models which reflect touches of Spain and the colorful Orient. Fabrics are soft and rich in texture, embracing Satin Canton Crepe, Roshanara Crepe, Brocaded Chiffon, Duvetyne, Laces and many more.

Handsomely Fur trimmed or plain tailored models.

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Reveal straightline silhouettes or pinched in waistlines

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These suits of personality are imbued with a character of tailoring which exemplifies the Stewart & Co. usual high standard, and assures one a correctness of fit and permanency of line. Luxurious fabrics favor such colorings as Navy, Malay Brown, Marmot Gray, Black, Sorrento Blue and Volnay Red.

Cashmere Duvetyne, Kashmir Radium, Delphine, Veldyne, Panvelaine, Gerona, Kasha Cloth.

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In attractive straightline and graceful flaring silhouettes

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Fashion takes her inspiration in lines from the circular Mantil as of Spain and goes to the distant Orient for her artistic garniture. The straightline silhouette, too, is favored and proves its beauty in many handsome models. Fine Furs tend to accentuate the lines of many models, while others are smart with embroideries and other ornature.

This Establishment will be CLOSED LABOR DAY—Monday, Sept. 5th.
Store Hours: 9 A. M. to 5.30 P. M.

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West 42nd Street (*Between 5th and 6th Avenues*) West 43rd Street

The Following Sales for TUESDAY:

September Offerings in Choice

PERSIAN and CHINESE RUGS

Highly desirable assortments at Reductions which make immediate purchasing worth while.

Persian and Chinese Rugs
Room sizes (average 9x12 ft.)
Values up to $550.00—Special, **$275.00**

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ANATOLIAN MATS—Beautiful silky, heavy weaves.....Values $17.50—Special at **$9.75**

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Richly embossed; typical shades of Blue and Gold; beautiful designs—

Size 2x4 ft.	Values to $40.00—Special,	$20.00
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IRISH HOUSEHOLD LINENS

At Considerable Reductions from Former Prices.

Pure Linen Satin Damask Cloths and Napkins

$4.50 $5.90 $7.25

NAPKINS to match, dozen $5.75

Pure Linen Guest Towels,	hemstitched,	dozen	$6.75
Pure Linen Huck Towels,	hemstitched,	dozen	$7.95
Turkish Bath Towels,		dozen	$5.90
Pure Linen Pillow Cases,	hemstitched,	pair	$2.50
Pure Linen Sheets,	hemstitched,	pair	11.50

Our Semi-Annual Sale of

CHINA and GLASSWARE

Offering 10 to 50% Reductions

T.&V. Limoges China Dinner Sets, 106 pcs.; new conventional border designs; matt gold handles. $95.00 Value, **$69.50**

T.&V. Limoges China Dinner Sets, 106 pcs.; wide gold encrusted border; matt gold handles; open stock. $375 Value, **$250.00**

Limoges China Dinner Sets, 106 pcs. Floral spray design; stippled gold handles. $59.50 Value, **$39.50**

American Porcelain Dinner Sets, 106 pieces; variety of conventional border designs; matt gold handles. $39.50 and 49.50 Values, **29.50 and 35.00**

English Porcelain Sets 100 and 106 pieces; Blue Willow and conventional border designs; some are open stocks. $49.50 and 75.00 Values, **39.50 and 49.50**

Imported China Dinner Sets 100 pieces; coin gold band and line; matt gold handles. $85.00 Value, **$59.50**

Imported China Tea Sets— 24 pieces; blue floral and bird design. $10.00 Value, **$7.50**

English China Service Plates— 10-in., full shoulder, gold encrusted border. $95 Value **69.50**

METHODIST CHURCH SHOWS LARGE GAIN

Net Membership Increases 1,255,091 in Decade Despite Heavy Losses During War.

1919 WORST CHURCH YEAR

Denomination's Sunday Schools in United States Report Decline, but World's Total Grows.

CHICAGO, Sept. 3.—A net gain of 1,255,091 members has been made by all divisions of the Methodist Church in the United States in the last ten years, despite great losses suffered by the denominations during the war, according to statistics compiled for presentation to the decennial Ecumenical Methodist Conference, which will open in London next week. The figures, compiled by the Rev. Dr. H. K. Carroll of Plainfield, N. J., former Director of the United States Census, were made public here today.

Methodist Sunday schools in the United States, however, the report says, show a net loss for the two years, 1918 and 1919, of 293,968, "an appalling figure," although 1920 returns indicate that "the lost ground is being regained." Notwithstanding that Sunday school pupils of the denomination in this country were 200,000 fewer in number in 1920 than in 1918, the enrollment throughout the world shows an increase of 1,289,036 Methodist pupils for the ten-year period.

"It is a remarkably good showing that American Methodism has to present to the Ecumenical Conference," declared Dr. Carroll's statement. "Delegates representing nearly 37,000,000 Methodist members and adherents will be in attendance. We can never forget that the past decade includes the worst war in history and that, though our nation was an actual participant in its battles for only a year and a half, we suffered with our Allies its terrible effects.

"The year 1919 was the hardest the churches of America have known, at least since the Civil War. Methodism in most of its branches suffered, with the other evangelical denominations, actual losses. The Methodist Episcopal Church suffered most of all, losing 43,262 in 1918 and 59,987 in 1919—103,249 in two years—and the conditions were even worse if we leave out foreign mission fields, for the net loss in this country alone in 1919 was nearly 70,000. The Methodist Episcopal Church, South, lost 16,404 in that year.

"In 1920 the tide turned for all evangelical churches, heavy gains succeeding the losses.

"Considering the heavy losses in the previous two years, it is remarkable that the total net increase in members and probationers of the Methodist bodies of the Western Section (United States) has been 1,255,091, exceeding the increase of the previous decade, 1900-1910, by nearly 282,000. The percentage of increase is also greater. For the decade ending in 1910 it was 16; for the past ten years, nearly 17."

Dr. Carroll, in commenting on the fact that the number of itinerant Methodist ministers, 48,405, represented a loss of 209 as compared with a gain of 6,531 in 1910 for the previous ten years, said:

"Certainly more ministers are needed instead of fewer for a growing Methodism. What is the trouble? Is the Methodist ministry less attractive than it used to be?"

In conclusion, Dr. Carroll says: "The net increase of Sunday school pupils for all Methodist bodies (in the world) for the ten years is 1,289,036. Of this handsome gain the Methodist Episcopal Church, the only body of any name, so far as I recall, which has more scholars in Sunday school than members in church, gets the lion's share—834,973. It also participates in the total increase of officers and teachers of 65,705. When it is remembered what a great recruiting agency for church members the Sunday school has become, the significance of the gains in the number, equipment and scholars of this institution is a happy augury."

PUTS HOSPITAL SHIP UNDER LINE OFFICER

Navy Department Assigns Captain Thomas L. Johnson to Command the Relief.

REVERSES RECENT POLICY

Regarded as Meaning No More Assignments of Medical Officers to Command Hospital Ships.

Special to The New York Times.

ANNAPOLIS, Sept. 3.—The assignment of Captain Thomas L. Johnson, who has been commander of the ships of the Naval Academy station, to command of the hospital ship Relief is regarded here as indicating a change of the policy of the Navy Department as to the command of ships of this character. For a considerable time they have been commanded by medical officers, instead of line officers, which is the status of Captain Johnson.

The action of President Roosevelt in assigning Medical Director Stokes to the command of a hospital ship caused considerable friction in the navy. Rear Admiral Willard H. Brownson, commanding the fleet to which this hospital ship belonged, was so strongly opposed to the action of Roosevelt that he was relieved of command by the latter.

This was the first assignment of an officer who was not of the line to duty of this kind. In spite of the fact that navy regulations and the revised statutes provide that line officers shall not be commanded by staff officers, it was practicable because officers of the merchant marine were assigned to duty aboard hospital ships under the medical officer who commanded.

Since officers of the Naval Reserve have been substituted for those of the merchant marine an untenable situation has been created, and it is understood that there have been several clashes, the authorities having to uphold Reserve officers in refusing to accept the command of medical officers.

The designation of Captain Johnson for command of the Relief is believed to indicate that this policy will be followed in the future by the Navy Department.

Hylan to Speak at Richmond Concert.

Mayor Hylan next Saturday evening will address the gathering at the concert which is to be held under the direction of the Park Department in the athletic field of Curtis High School, St. George, S. I., in honor of the Staten Island Chamber of Commerce. In the program for the concert, which is being widely distributed, a distinctly political atmosphere is given to the affair by a recital of the many things asserted to have been done for Staten Island by the Hyland administration.

WARNS OF MOURNING PLANNED IN PANAMA

Canal Zone Governor Says That the Project Is Anti-American Propaganda.

URGES AMICABLE FEELING

Disturbances, He Asserts, Would Result in Policing of the Cities of Panama and Colon.

PANAMA, Sept. 3.—Colonel Jay J. Morrow, Governor of the Canal Zone, has addressed a note to the Panaman Government charging that the projected closing down of all business on Labor Day as an expression of public mourning for the loss of the Coto district, on the Costa Rican frontier, is "anti-American propaganda." Governor Morrow states that this attitude on the part of the Government might lead to disturbances next Monday throughout the republic.

Proposals that there be erected a monument commemorating the Coto affair are characterized by Governor Morrow as an "hostile act toward the United States and one that would engender ill feeling between the two peoples." He points out the strong ties linking Panama and the United States, and declares it is necessary to maintain amicable relations. Disturbances, he declares, would bring about the policing of the cities of Panama and Colon by American forces.

Secretary of Foreign Relations Alfaro, in reply, has stated that the Panaman Government is animated by a desire to maintain amicable relations, and that anti-American propaganda and the movement for the erection of a Coto monument will not receive sanction from the Government.

Weeks May Ask Explanation.

Special to The New York Times.

WASHINGTON, Sept. 3.—Secretary of War Weeks stated today that he might call upon Colonel Jay J. Morrow, Governor of the Canal Zone, to explain reports that he has addressed a note to the Panama Government charging that the projected closing down of all business on Labor Day as an expression "of public mourning for the loss of the Coto district on the Costa Rican frontier is anti-American propaganda."

Governor Morrow was not authorized by the War Department to make such a communication to the Panama Government, and Secretary Weeks has not been advised that the State Department has asked him to take such action. Mr. Weeks indicated that Secretary Hughes would not have asked Governor Morrow to act without first bring the matter to the attention of the War Department, especially since the natural avenue for any communication between the United States and Panama would be through Mr. Price, the American Minister at Panama.

Mr. Weeks said he had been unofficially informed that Governor Morrow was aware of the situation in Panama, but the Secretary lacks confirmation of reports that the American army officer has actually exchanged notes with the Panama Government.

In case of disturbances at Panama City which are too serious for the local authorities to control, it would devolve upon the American authorities to restore order, Secretary Weeks said, and there are plenty of American troops in the Canal Zone for such purposes. The command of these troops, however, rests not with the Governor of the Canal Zone, but with the commanding officer of the American military forces on the Canal.

State Department officials indicated tonight that the department had not asked Governor Morrow to intervene in the Panama situation.

SAYS SHE WAS JILTED.

Girl, Suing for Breach of Promise, Tells of $3,000 Loan.

Stanislaus Cichoski, one-time Secretary for Young Poland, Inc., with offices at 202 East Twelfth Street, promised to marry Miss Walerie Jozefowska of 374 Forty-fifth Street, Brooklyn, but married another, Miss Jozefowska complains. Yesterday she began a breach of promise suit for $25,000.

In the papers, filed in the County Clerk's office, Brooklyn, Miss Jozefowska says she met the defendant in December, 1915, at a bazaar for Polish war relief and that they became engaged in March, 1916. At various times during their friendship, the plaintiff says, she lent Cichoski money aggregating $3,000. Cichoski is described as a scenario writer.

The Tailored Woman INC.
A Shop of Tailor-mades

SCHOOL AND COLLEGE CLOTHES FOR YOUNG LADIES

IN keeping with our policy to specialize in clothes of a simple character, we have prepared an exceptional collection of Frocks, Suits, Coats, Blouses and Sweaters that are smart, but correct for wear at select finishing schools and colleges.

Wooltex Suits and Top Coats 48.00 *upwards*

Frocks of Canton Crepe Satin Crepe and Twills 58.00 *upwards*

College Sweaters in exclusive autumn shades 10.00 *upwards*

Exclusive New York Shop for Wooltex Tailormades

622 Fifth Avenue at 50th Street

Lord & Taylor

We Wish To Announce

A Change in Store Hours

Tomorrow, Labor Day, the store will be closed all day. Beginning Tuesday, September 6, we will close daily at 5:30 P. M.

September Is Here!

September is the entrance to Fall, with children entering school, town houses being reopened and new clothes to be selected. We are in a complete state of readiness in all departments to show you things new and charming from Europe and America—and the much lower plane of prices will attract you.

See our advertisement in this paper Tuesday morning

PARIS **Best & Co.** LONDON
Fifth Avenue at 35th Street—N. Y.

presents

PARIS MILLINERY

at the usual cost of the domestic

The "Marquis," a tricorne model inspired by the dashing affairs worn during the Venetian Renaissance, is developed by Georgette in the new fuchsia shades. Illustrated A.

It flares back from the face like the head-dress of a mateador, this black hatter's plush hat by Lewis. The large crimson lined poppy is the only trimming. Illustrated B.

THE Paris millinery has arrived! Several hundred hats only a fortnight out of Paris, just a few hours out of their Paris wrappings! All the most successful models from the most famous modistes are here—hats new in line, rich in fabric, novel in trimming—wonderful creations that bear such distinguished names as Maria Guy, Evelyn Varon, Lewis, Talbot, Geogette, Lucie Hamar, and Hermance. They were personally selected by our Paris representative and will be presented to our customers at landed cost.

But there are other Paris hats, too—two hundred of them—counterparts in smartness of those from famous makers, but less costly by several hundred francs, no more expensive in fact than American made hats. They come from those "Petites Maisons" that our Paris organization is constantly searching out for our customers' benefit—from the "Little Masters" who will some day rise to fame.

The presentation of so large a number of original Paris hats marks a departure from the American custom of importing hats only to copy, but it is a departure which, we believe, our patrons will welcome.

Paris Model Hats - 35.00 to 75.00
Other Paris Hats - 15.00 to 45.00

The black hat that is so prominent a part of the Paris vogue of black is developed by Jeanne in hatter's plush with the newest of trimmings—monkey fur. Illustrated C.

One of the large hats that Paris is wearing. A single superb black paradise completes the picturesque sweep of its broad brim. Illustrated D.

9 LINERS DEPART; CHAPLIN GOING HOME

Film Star Shies at Camera, Then Submits on Promise That "It Won't Hurt Him."

ALL CABINS WELL FILLED

Many Travelers Make Late Start for Holiday Abroad—Ansorge to Inspect Harbors.

Nine liners sailed yesterday for Europe with well-filled cabins. Their lists contained the names of many well-known Americans going abroad for pleasure or business. The procession down the harbor, which drew alarge crowd to the bor, which drew a large crowd to the White Star liner Olympic, which left her pier just after 8 o'clock in the morning.

The passenger who attracted the most attention was Charlie Chaplin. He said that he was going to spend a month in England visiting the scenes of his boyhood in Brixton, a suburb of London. Chaplin said that he wanted to ride in the old Brixton buses to London over Westminster Bridge, past the Housee of Parliament to Piccadilly Circus, as he used to do years ago.

When Chaplin stepped out on the A deck of the Olympic in front of a battery of moving picture machines he gave an affected start and said to an official of the company: "Gracious, what are these?" When told that they were moving picture machines and would not harm him, the film star appeared relieved and said: "Oh, thanks, so much; I am not afraid."

"Do you intend to marry again?" he was asked.

"No, never," he replied. "I am through with that business."

Douglas Fairbanks and Mary Pickford went to the liner to see Chaplin away, but kept out of sight the greater part of the time, as they did not wish to get in the limelight.

Representative Martin C. Ansorge of the Twenty-first New York District sailed on the Olympic to make an inspection of the principal foreign ports and harbors, and to make a close study of trade and labor conditions abroad.

Sees Greatest Port Here.

"In my opinion," said Mr. Ansorge, "the port of New York is the greatest natural port in the world. The port has made some progress in development, but the greatest step forward in the development of the port was the signing of the treaty between New York and New Jersey providing for unified control and operation of the port."

The Rev. Nehemiah Boynton, D. D., for fifteen years pastor of the Clinton Avenue Congregational Church, Brooklyn, sailed on the Olympic for Geneva, where he will attend an international conference on friendship on Sept. 14. Dr. Boynton is a member of the Executive Committee.

Colonel William N. Haskell, head of the American relief expedition to Russia, left on the liner, with a staff of eighteen assistants. Robert Walton Goelet was among the 400 first-cabin passengers, on his way to visit his parents in France. Dr. May Turner Stout sailed, on her way to Constantinople to become an instructor in the medical department of the Woman's College in the Turkish capital.

The Mysterious "Mr. Housten."

The Holland-America liner Rotterdam sailed yesterday afternoon for Rotterdam via Plymouth and Boulogne without a first cabin passenger whose name, according to cards on boxes of fruit, flowers and candies piled up in the purser's office, was "Mr. Houston." One of the presents was an immense horseshoe of roses and lilies, which the purser finally decided to put in the dining saloon when the owner could not be found before the liner sailed.

May Have Been for Chaplin.

It was reported that Charlie Chaplin was to have sailed on the Rotterdam under an assumed name and it was thought probable that he was the mysterious "Mr. Houston" for whom so many gifts were received. The horseshoe had a broad white satin ribbon tied round it on which was written in gold letters, "Good luck—the Girls."

Among the passengers was U. H. Van Royen, the Dutch Minister to Rome, with his wife, who have been spending three months here. Mrs. Van Royen was the daughter of the late Robert Winthrop and sister of Beekman Winthrop, Assistant Secretary of the Navy under President Taft.

The new Cunard liner Scythia sailed at noon for Liverpool on her maiden voyage eastward and received a chorus of whistles from the tugboats and other craft in the river as she swung out from the pier. Captain William Prothero said that he expected to make sixteen knots with the ship going home and that when her two extra boilers were in commission he believed that the liner would develop an average speed of eighteen knots.

Maxwell H. Maxwell, a director of the company who is making the round trip voyage, said that he had been much impressed with the business activity in the United States, which was more apparent to te observer than in England at the present time.

Maurice de Casanave, French High Commissioner, was a passenger on the French liner Lorraine which left at noon for Havre. He said that his stay in America had been most pleasant and he hoped to return either as a Government official or a private individual.

Other liners sailing yesterday were the White Star liner Cedric, the Italian liner San Giovanni, the Swedish-American liner Brottniggho for Gothenburg, the George Washington for Bremen, the Madonna for Naples and the Pacific Steam Navigation liner Essequibo for Valparaiso.

The chief incident on the voyage of the Holland-American liner Ryndam, which arrived last night, was the birth of a baby girl to Mrs. Georgianna Kronenberg in the third-class on Friday night. The husband is 67 years old. Mother and infant are doing well and will go to 1,126 East 102d Street, Cleveland. Dr. U. B. Ubrecht, Secretary of the Dutch Legation in Washington, was a passenger.

GEORGE WASHINGTON SAILS.

Liner Carries Many Germans—Senator Knox a Passenger.

The liner George Washington sailed yesterday for Bremen, via Plymouth and Cherbourg, with a good complement of passengers, of whom the greater number in the second cabin were of German birth going to see their families now that the treaty with the United States has been signed.

The liner was the first to sail of the newly formed United States Line, organized to operate the nine former German passenger steamships for the United States Shipping Board. She carried a large quantity of mail.

Several shipping officials, including W. Averill Harriman, Kermit Roosevelt and August F. Mack, district manager of the Shipping Board in New York, saw the ship depart. One of the prominent passengers in the first cabin booked for Plymouth was United States Senator Philander C. Knox of Pennsylvania, who was accompanied by Mrs. Knox. They expect to spend five weeks touring in England and Scotland.

Other passengers were Hernando de Soto, United States Consul to Berlin, and Mrs. de Soto. He is going to reopen the consulate, which has been closed since April, 1917, when the United States declared war against Germany.

The liner was commanded by Captain Harold A. Cunningham, who was in charge of the ship when she sailed her last voyage for the United States Mail Steamship Company.

For the School Girl

At the left is a smart, trim model tailored to fit the youthful figure. Of the finer quality, navy serge trimmed with duvetyne in red, green and delft blue.

The center model features a frock of Puritan quaintness in black, brown, henna and deer shades of jersey, finished with kid collar, cuffs and pocket trimmings in contrasting colors.

Navy tricotine tailored model is shown at the right. The novelty basket pockets made of ribbon and embroidery and the duvetyne collars are interesting features.

22.00 16.50 38.00

Complete assortment of school dresses in silks and cloths from 14.00 upwards

Junior and Misses Sizes

Betty Wales
DRESS SHOPS
BAER BROS. COMPANY INC.
304 FIFTH AVE. AT 36TH STREET

Pioneer and Premier in Slenderizing Fashions for Stout Women

TWENTY years of soaring inspiration and patient perseverance have changed Lane Bryant from a small shop, with dozens of customers, to a great building that counts its clientele among the hundred thousands every year.

Through its doors more women desiring special slenderizing service pass each day than visit all the other stores, put together, each month.

As virtue is its own reward, so service is its own success. Our happy and contented clientele is our greatest accomplishment.

Lane Bryant
21-23 West 38th St., Just West of 5th Ave.

Comfort is Fashionable

Wherever you go nowadays you will find a great many of the smarter women wearing Cantilever Shoes. At the Biltmore, in trim tailored suits with Cantilevers just as trim, you will see them at tea; at the tennis matches in comfortable sport clothes and Cantilevers; in New York, San Francisco, Philadelphia—everywhere. For comfort has become fashionable today, and Cantilevers have the trim lines that harmonize with the ideas of American women.

Like the foot, the arch of the Cantilever Shoe for Men & Women is flexible. Your foot muscles, relieved of the restraint of the ordinary stiff sole, are encouraged to exercise, your blood to circulate, your arch to grow strong.

The very first day you try Cantilevers you will feel the delightful ease caused by the well-placed heels, the natural inner sole-line, the thoroughly scientific construction that makes a Cantilever.

You'll like their style, too. Widths from AAAA to E.

Oxford in black Kid, $10.50
Tan Calf, $11.00
Brown Kid, $11.50 and
White Canvas, $9.75

CANTILEVER SHOE SHOPS
22 W. 39th St., nr. 5th Av., N.Y.
414 Fulton St. (over Schrafft's), Brooklyn
897 Broad St. (Aeolian Hall), Newark
Also at J. & J. JACOBSON
Lexington Av., at 60th St.

MAXON
MODEL GOWNS
Now at
11 East 36th St.
Havilland Building
Two Unusual Costumes at the Usual Price of One

Hair Mattresses Made Over $3.50
CLEANED BY ELECTRICITY
Returned in 24 hours. Brass beds refinished and relacquered. Mattresses made to order. We also sell beds, bed springs and box springs at wholesale prices.
BRONX SANITARY MATTRESS CO.
3373 THIRD AVE.
NEAR 166TH ST. PHONE 7145 MELROSE

FOREIGN EXCHANGE PROBLEM.
An article on the problem of international trade, which the writer says is hampered by the absence of stabilization of foreign exchange. In The Annalist, out tomorrow. Published by The New York Times Company. 10 cents a copy at news stands; $5.00 a year by mail.—Advt.

B. Altman & Co.
MADISON AVENUE - FIFTH AVENUE, NEW YORK
Thirty-fourth Street TELEPHONE 7000 MURRAY HILL Thirty-fifth Street

The New, Wonderful Fabrics for Autumn and Winter

now so lavishly displayed on either side of the spacious aisles of the great First Floor, include every rich and beautiful textile produced for the dawning season by the most celebrated looms of Europe and America.

Here are rare brocaded velvets, in black and the glowing Autumn colors; as well as the rich, erect-pile Lyons (imported) velvet, in black only; metal-brocaded georgettes and handsome miroir effects in metal silks; imported crepe-back charmeuse, satin Canton crepe, crepe-back satin, and the always popular drap de chamois.

Among the new woolens are Canadian tweeds and homespuns—a novelty in the United States, although woven across the border; Scotch and English tweeds and cheviots; broadcloths; wool brocades; wool crepes; silk-and-wool duvetyn; cut-work and embroidered serges and tricotines; and the modish krimmer and other fur cloths.

Also the latest novelties in
Laces, Trimmings and Ribbons

Misses' Autumn
Tailored Suits & Frocks

Nothing is quite so vitally important at the moment to the fashionable demoiselle—be she schoolgirl, college student or "society bud"—as the fabric and fashioning of her early Autumn suit or tailored frock.

The new models displayed for the season's opening in the recently enlarged Departments on the Second Floor represent the most advanced ideas of the great arbiters of style.

The svelte lines express the verve and elasticity of youth; the soft-surfaced materials are representative of the luxurious tastes of the present day. Many of the suits are enriched with lovely furs; while the frocks introduce any number of charming novelties in modeling and decoration.

The prices (in stock) range as follows:
Plain-tailored Suits, $39.50 to 250.00
Fur-trimmed Suits, 59.00 to 410.00
Tailored Frocks . 29.50 to 210.00

Misses' and Children's
Smart Shoes
for school, street and formal wear

featuring all the newest and most fashionable models for the Autumn and Winter seasons, are now assembled in readiness for the early September demand.

The following scale of moderate prices comprises only footwear made of the best selected leathers. In all cases the workmanship is exceptionally fine, while the lasts are those approved by the leading specialists in foot science.

Calfskin Laced Boots
(black or tan)
Sizes 8½ to 10½ . per pair $6.00
Sizes 11 to 2 . . per pair 6.75
Sizes 2½ to 7 . . per pair 9.75

Calfskin Oxfords
(black or tan)
Sizes 2½ to 7 . . per pair $8.75
(Second Floor, Madison Avenue section)

For Tuesday
Wool Jersey
(54 inches wide)
in an extensive range of the most desirable colors, as well as the always wanted black
at $1.85 per yard
Wool jersey is in demand for smart sports and street suits, to be worn during the Autumn and Winter seasons.
(First Floor)

For Tuesday
A Special Offering of
Imported Seamless
Axminster Rugs
(made in Scotland; size 9x12 feet)
at the extraordinarily low price of
$58.00
A really wonderful value at this figure
(Rug Department, Fifth Floor)

FRANCE TO GET GERMAN MATERIAL

7,000,000,000 Gold Marks of Building Supplies to Be Delivered in Next Three Years.

ALL TO REBUILD RUIN AREA

Government Not to Cut Prices Below Reasonable Competition With Private Interests.

PARIS, Sept. 3 (Associated Press).—The delivery to France by the German Government of 7,000,000,000 gold marks worth of building materials within three years is provided for by the recent agreement between Louis Loucheur, French Minister of the Liberated Regions, and Walter Rathenau, German Minister of Reconstruction, the details of which were made public here today.

This immense transaction will be handled by two companies, one to be organized by Germany and the other by France, each to be under Government control, but to allow participation by some private capital. The German company is to look after the assembling of material ordered by the French companies at the shipping points. Transportation and delivery by the German company at suitable terminals and on suitable dates also is provided for, the payment to be made to the manufacturers out of German Government bonds issued specially for this purpose.

The French company will take the material thus delivered and sell it in the open market exclusively for rebuilding Northern France. The French Government, according to the terms of the agreement, will take care not to cut prices below a reasonable competition with private interests which hitherto have been strongly opposed to Germany's supplying material to the detriment of French manufacturing firms.

It is considered likely that the agreement will meet with some criticism when it comes up for ratification by the French Chamber of Deputies. It is generally believed that the German Government also foresees difficulty with the Reichstag, but it is understood the German Government leaders will argue that the Loucheur-Rathenau agreement is strongly for the national interest, because it will enable Germany to meet its reparations payments largely by materials instead of being obliged to find cash securities in foreign markets on a falling exchange rate.

Herr Rathenau's main argument was that if Germany were compelled to continue cash payments under the same international exchange conditions as those she encountered while paying the first billion marks she would be forced inevitably to default, probably not later than next July. The mark, which has already decreased in value since the recent London agreement, is likely to fall to a point where it will have no more exchange value abroad, it was argued by Herr Rathenau.

SAYS DU PONTS SEEK TO LEARN DYE SECRETS

German Chemist Accuses Them of Bribing Elberfeld Experts With High Salaries.

BERLIN, Sept. 3 (Associated Press).—The Tageblatt states on the authority of Dr. Beckmann of the Chemical and Pharmaceutical Association that the du Pont Company of Wilmington, Del., has engaged a number of leading chemists of the big Elberfeld dye works at large salaries, with a view, Dr. Beckmann alleges, of appropriating the secret processes of German dye manufacture.

This, the newspaper asserts, is only one instance of many attempts by foreign firms to induce German employes to betray chemical and pharmaceutical secrets.

The whole question arose out of the Tageblatt's inquiry into the truth of allegations said to have been made by foreign medical journals that German medicaments for consumption abroad have been deliberately adulterated for the purpose of damaging the health of former enemies. These allegations, according to the paper, are entirely unfounded, but it admits that eight cases were discovered of innocuous adulteration of pharmaceutical products, which it says were due to the manipulations of illicit traders.

GREEKS PUSH ADVANCE.

But They Are Encountering Hard Fighting in Thrust Toward Angora.

ATHENS, Sept. 3.—Greek forces continue their advance against the Turkish Nationalists and have occupied successively a number of fortified positions near the Sakaria River, says an official statement issued here. Further south they have captured the fortified heights of Yildiz Dagh, and have advanced toward the north. In their march toward the east the Greeks have taken strongly fortified lines, in which the combat developed into hand-to-hand struggles.

LONDON, Sept. 3.—Latest reports from the Greco-Turkish fighting front in Asia Minor, sent by the Smyrna correspondent of Reuter's, indicate that heavy fighting is still in progress. The Greeks say that they have captured a fortified position east of the River Sakaria.

CONSTANTINOPLE, Sept. 2 (Associated Press).—The Greek advance toward Angora has been delayed, owing to the vigorous counter-attacks of the Turks, who have occupied mountain positions dominating the Ilija River. Withdrawing slowly, the Turks are counter-attacking for the purpose of covering the retreat of their main forces to the east of Angora.

The Greeks are running several trains daily between Eski-Shehr and Saraksuy, thus moving supplies to the front with the greatest rapidity. The water supply difficulty is being overcome, as the Greeks are approaching a fertile region and flourishing villages.

GENERAL HEADQUARTERS OF THE GREEK ARMY IN ASIA MINOR, Sept. 2 (Associated Press).—The battles against the enemy's lines of defense are coming to an end. This announcement has been received with enthusiasm by the Greek soldiers, who have been fighting continuously for seven days and seven nights.

With scanty food and water supplies and almost without sleep the Greeks are greatly fatigued after a three weeks' march through an almost deserted country and against difficult obstacles.

CREW ROW 400 MILES, MEET RESCUERS AT SEA

Swept Pacific to San Francisco Three Days Seeking Aid for Crippled Steamer.

SAN FRANCISCO, Sept. 3.—The missing lifeboat of the crippled steamer Canadian Importer, containing eleven members of the Importer's crew, was picked up early today 105 miles off San Francisco by the Red Stack tug Sea Lion, from this port.

The lifeboat's occupants were reported by Captain George Gove of the Sea Lion, in a wireless message to the Red Stack Company, to be "all safe and well."

The Sea Lion was expected to continue on to the Importer, which was located Wednesday night, 500 miles west of here. The tug left here yesterday to aid in pumping out the Importer so she could be towed to port.

The lifeboat left the Importer on Aug. [illegible] to seek aid for the disabled vessel. In marine circles it was estimated the [illegible] drifted or was rowed more than [illegible] miles before it was picked up.

TALK OF RANSOMING SPANISH GENERALS

Contradicting Rumors About Navarro — Report That Silvestre Lives Revived.

MADRID, Sept. 3 (Associated Press.)—A delayed dispatch from Melilla, dated Aug. 30, says that the release of General Navarro, the Spanish commander in Morocco, who was taken prisoner recently, is believed to be imminent. Negotiations for his ransom, as well as for that of the officers and soldiers accompanying him, are now in progress.

"The Spanish gunboat Laya," the dispatch continues, "left here last night for Alhucemas, carrying new officers' and soldiers' uniforms, supposedly for the purpose of reclothing the released prisoners.

"The visit here of the Spanish War Minister, Senor Cierva, was received without enthusiasm. While here the Minister visited the advanced positions, riding in an armored car. During his entire visit the Moors maintained incessant rifle firing and attacked a blockhouse between Atalayon and Sidi-Ahmed, cutting the barbed wire, slitting holes in the sandbags and throwing hand grenades inside."

Abd-El-Krim, commander of the hostile tribesmen in Morocco, will decline to accept a ransom for the release of General Navarro, who was captured by the Moors on Mount Arruit, says the Melilla correspondent of the Heraldo. It is said that General Navarro will be held as a hostage.

The correspondent suggests that the Moorish leader intends to keep General Navarro captive until the Spanish forces start an advance, and then to enter into negotiations for the release of the officer in return for concessions from the Spaniards.

It is reported from Ferrol that the Minister of Marine has given instructions for the laying of the keel of a 10,000-ton cruiser as soon as the liner Cristobal Colon is launched.

Relatives of General Silvestre, commander of Spanish forces which were badly defeated before Melilla, late in July, have received a communication from the Moroccan tribesmen making a proposition for the General's ransom, says a newspaper here. At the time of the Spanish defeat, dispatches from Morocco stated that when it became apparent that the Spaniards had been beaten General Silvestre committed suicide.

The Melilla correspondent of El Heraldo cables a strange story related by a Spanish soldier who was captured by the Moors and later released. The soldier is quoted as saying that on the day he was set at liberty Abd-el-Krim, commander of the Moorish forces, took him through several subterranean galleries and showed him in a heavily barred cell a Spaniard whose face was horribly disfigured. The Moorish commander said: "This is a soldier like you, but you are liberated, and he is not."

The correspondent suggested that the captive in the cell might possibly have been General Silvestre.

The Moorish garrison at Nador is daily receiving strong reinforcements, especially from the Rif region, whence they have brought sixteen cannon with which they threaten to bombard Melilla if Spanish aviators continue to bomb the Moorish villages. In the event that the bombing is discontinued the Moors promise to confine their attacks to the Spanish advanced positions in their territory and to convoys. A report is current that the tribesmen intend to attempt the mining of Atalayon.

Two delegations of tribesmen recently visited the French General Lyautey, requesting protection, as they feared severe reprisals by Spanish troops on the ground that they had committed acts of treason.

General Lyautey is said to have replied that international conventions forbade his agreeing to the request, but that he would protect them after they had been conquered by the Spaniards.

Sheik Ahmed Mobchereuiti is seeking to renew negotiations with the Spaniards, promising to assist in the pacification of Quebdana.

MELILLA, Morocco, Sept. 3 (Associated Press).—Moorish tribesmen lost severely in the fight Wednesday and Wednesday night before Spanish positions at Mesquita, one of the outposts of this city. The attack of the Moors was most determined, and reports that they were badly defeated have been confirmed by news received from the enemy's camp.

Special Cable to THE NEW YORK TIMES.

BERNE, Sept. 3.—According to the local press, the Spanish Government is keeping recruiting agents in Switzerland to induce Swiss to join the Spanish Foreign Legion. The press warns Swiss against allowing themselves to be enticed into the Legion, pointing out that, although the Spanish recruiting officers promise the men two and a half pesetas daily, one and a half are deducted for food and lodging.

ST. LOUIS, Sept. 3.—An order for 1,400 head of mules involving $150,000 was placed here today by a representative of the Spanish Government. The mules will be used by the colonial army in Northern Africa and for domestic purposes.

CHARLES, HARD UP, WANTS PROPERTY BACK

Will Contend That It Belongs to Hapsburgs, Not to the Crown.

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Special Cable to THE NEW YORK TIMES.

LUCERNE, Sept. 3.—Former Emperor Charles having temporarily abandoned all hope of returning to Hungary and assuming the crown of St. Stephen as preliminary to regaining the Austrian crown, intends, I am informed, to apply to the Austrian Government for the return of property which he alleges was private property of the Hapsburgs and did not belong to the crown.

The reason why he has done nothing to recover it hitherto is that he hoped it would revert to him naturally when he recovered the crown, but now being in straitened circumstances and regaining the crown beset with difficulties he cannot wait longer.

As one of his entourage at Hertenstein Castle here remarked, the ex-German Emperor at the end of 1920 had received from the German Republican Government 70,000,000 marks and fifty-three van loads of furniture, including a thousand silver knives and forks, a thousand silver plates and three hundred and sixty gilt plates, besides hundreds of valuable epergnes, dinner services and table ornaments generally.

Besides this William received 100,000,000 marks as compensation for certain artistic objects, pictures, &c., sold from the private property of the Hohenzollern castles. Moreover, William is claiming from Prussia the formerly royal castle of Homburg, the Castle Cecilienhof and Marmor palace, the two last in Postdam.

"Compare," said Charles Hapsburg's friend to me, "this behavior of the German Government with the behavior of the Government of the former Hapsburg monarchy," and he assured me that but for generous contributions from friends the Hapsburg family would not be able to live.

At the time of cabling nothing definite is known at Hertenstein Castle concerning whether the Spanish Government will accept Charles Hapsburg or not, and the Swiss Government is anxiously awaiting Spain's decision.

ASKS MAGYARS TO YIELD.

Council of Ambassadors Urges Them to Give Up Burgenland.

PARIS, Sept. 3.—The Council of Ambassadors today instructed the allied diplomatic officials in Budapest to request the Hungarian Government not to place any more obstacles in the way of occupation of Burgenland by the Austrians, as provided in the peace treaty with Hungary.

The Hungarian Government will be asked to live up to the stipulations of the treaty in this connection.

SEES GERMAN CRASH IN FALSE SUCCESS

Fall in Mark and Increase in Issue Is Inflating Prices, Says Moody.

HER UNDERSELLING TO END

France's Future Is Secure and Credit Is Sound, Head of Investors Service Declares.

"Germany's paper prosperity is leading to a crash," says John Moody, President of Moody's Investors' Service, who has just returned from a tour of Europe, where he investigated economic and financial conditions. But France is following the path of safety in all her governmental places, and has turned her face definitely away from the inflation mania, in the opinion of Mr. Moody.

"Surrounded by the adverse exchange wall, Germany is forced to develop intensive trading activity among her own people," continued Mr. Moody in his analysis of the situation. "Only in the East can she trade with other countries on anything like an equal basis. The mark has fallen so low, and the printing presses are revolving so fast to make the mark still less valuable, that the one thought of every German is to get more and more marks for his goods or labor and then exchange his marks for real property with lightening speed.

"The successful man in Germany is the one who converts his money into property with the greatest rapidity. This situation is forcing the inflation of prices and wages with great rapidity. Thus the present advantage which Germany enjoys of being able to flood the world with cheap goods is already beginning to be curtailed. Prices and wages, as measured in marks, are certain to soar higher and higher and the time is not far distant when Germany will no longer be able to undersell other coutries in the way she is now doing. Then will come the complete collapse of her inflation bubble, and a general house cleaning of her finances.

"The French situation is also extremely interesting. Much loose talk is indulged in in this country regarding France's ability to surmount her financial difficulties. But I come back with the firm conviction that the future of France is absolutely secure; that her credit is sound and is steadily improving; that, great as are her financial problems, she is strong enough to solve them all."

There is absolutely no danger of Bolshevism spreading outside of Russia, says Mr. Moody.

Miss MacDonnell Prize Winner.

THE NEW YORK TIMES of Sept. 1, in a story of the baby parade in Asbury Park, stated that the fourth prize for burlesque was awarded to Marion Halpert and Cecil Hoskin. This was incorrect, the fourth prize having been given to Miss Marjorie MacDonnell.

EXPECTS FOUR NATIONS TO JOIN SAN JOSE UNION

Guatemalan Diplomat Thinks Nicaragua Will Follow Guatemala, Honduras and Salvador.

Special to The New York Times.

WASHINGTON, Sept. 3.—The constitution of the proposed Central American Union will be ready for signature by the member republics by Sept. 15, the date on which the centenary of Central American independence from Spain will be celebrated, according to Dr. Julio Bianchi, Guatemalan Minister here, who has just returned from a visit to his country.

While the real purpose of his trip to Guatemala, he said, was to take up with his Government the question of a $25,000,000 loan, which it desires to make in this country to provide for the establishment of a national bank, the building of an intersecting system of highways throughout the country and other public improvements, Dr. Bianchi received reports regarding the progress which the Constitutional Assembly of the Federation of Central America, now sitting at Tegucigalpa, Honduras, is making in the drafting of this document.

There seemed to be little doubt, the Minister said today, that the federation would be solidified and come into being on Sept. 15. Guatemala, Honduras and Salvador have agreed to the compact, which was drawn up at San José some months ago, providing for the union of the five Central American countries. Nicaragua objected at that time to several features of the plan, especially that portion which affected its treaty relations with the United States; but Dr. Bianchi believes Nicaragua will become a member of the federation either on or before Sept. 15.

A representative of the Nicaraguan Government has recently been in Tegucigalpa conferring with the representatives of the other Governments, and the changes in the constitution which Nicaragua desires may be made.

These would permit any member State not only to live up to any treaty obligations already incurred, but also to negotiate and carry out any future treaty agreements that might be necessary.

Nicaragua, in raising objections to the constitution, had particularly in mind, it was said, her treaty with the United States granting this country permission to build [illegible] Nicaragua [illegible] time [illegible] deemed necessary. As the Bryan-Chamorro treaty providing for this is only general in its terms, it will be necessary, when the time comes to build the canal, to make a more definite agreement in regard to the details of the project.

Nicaragua also desired permission for any individual State in the Union to contract a loan needed only for internal uses, on its own authority and responsibility.

ONE ZR-2 VICTIM MISSING.

Body of William Julius of Los Angeles Is Not Yet Recovered.

HULL, England, Sept. 3.—The body of only one of the Americans who lost their lives in the recent ZR-2 disaster is now missing, that of William Julius of Los Angeles. The inquests, opened today on the four latest bodies to be recovered, including those of J. T. Hancock and Lieutenant H. W. Hoyt, were adjourned until Oct. 4, the date set for the inquests for the others.

It is expected that the fifteen American bodies already recovered will be held here until the body of Julius is recovered, when all of them will be sent to America together.

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In the days of Lorenzo the Magnificent when England was still primitive and America yet undiscovered, Florentine women were educated in art, letters and even law.

Frocks

For Class Hours and After

Sleeveless frocks of Poiret twill with colored suede belt. 18.50

Two-piece worsted Jersey frocks with detachable piqué collar and cuffs. 29.50

Poiret twill tailored frocks with hand embroidered panels and little tassels. 39.50

Canton silk crepe afternoon frocks with youthful and original treatments. 59.50

Coat-frocks or straight-line modes of Poiret twill or worsted check. 65.00

Formal frocks of broché velvet, Lyons velvet, silk crepe or with lace treatments. 125.00

Suits

That are Part of the Curriculum

Tailored suits of duvet de laine or worsted check with belted coats. 45.00

Tweed suits with kit fox or pahmi fur collar, belted coat and straight-line skirt. 55.00

Moussyne tailored suits with strappings, in forestry colorings. 69.50

Moussyne suits in individual modes, with wolf, mole, Hudson Seal or oppossum. 85.00

Hats

At the Head of the Class

"Bouillonné" hats—soft, rakish, of velvet combined with ribbon, in the class colors of autumn. 11.75

Brittany Beret hats of velvet in all autumnal colorings. 11.75

THE ALMA MATER of APPAREL for the JEUNE FILLE at SCHOOL

WHILE expressing a fine sense of fitness to the requirements of school or college life, Bonwit Teller & Co. campus fashions recognize the truism that dress must be individual to be pleasing as education must be individual to be effective. For as dear to a youthful heart as the beautiful adventure of college itself are clothes that share its sympathies and glorify its experiences. With these ideals of dress in relation to school and college life and with this sensitive understanding of the unfolding years of youth, Bonwit Teller & Co. present apparel for the coming semester—fashions for the golden Jeune Fille age that has stepped over the threshold of girlhood into the academic halls of womanhood.

Not Apparel for Every Age—but the Most Particular Apparel for the Particular Ages of 14 to 18 Years

Coats

Present "Elective" Courses

Topcoats of frieze coating with leather buckle and buttons. 39.50

Three-quarter topcoats of frieze coating with raccoon or opossum fur collars. 59.50

Dress coats of Wondora or Gerona with collars of wolf, beaver, squirrel or opossum fur. 125.00

Sweaters

That Uphold the Class Sportsmanship

High or V-neck slip-on sweaters of alpaca with purled bottom or narrow sash. 7.50

Tuxedo sweaters of alpaca in plain stitch with pockets and narrow sash. 11.50

Blouses

Classmates of Suits or Sweaters

Dimity tailored blouses with rever or Peter Pan collars. 3.95

"Bontell" tailored shirts of crepe de chine with pleatings. 11.50

Shoes

That Tread a Scholarly Measure

Straight tip Oxfords of black or tan Russia calfskin. 10.00

Golf Oxfords of tan leather with brown saddle; corrugated rubber soles. 10.00

One-strap patent leather pumps with low heels. 10.00

"LONGCHAMPS"—one-strap pumps of patent leather, satin or kidskin with round toe and Spanish heel. 10.00

BONWIT TELLER & CO.
The Specialty Shop of Originations
FIFTH AVENUE AT 38TH STREET

HARDING SEES PROOF PEACE IS WISEST

Points to Unfortified 3,000-Mile Canadian Boundary as the Best Evidence.

LETTER ON BORDER PORTAL

President Sends Congratulations to Be Read at Dedication of Memorial.

Special to The New York Times.

WASHINGTON, Sept. 3.—The White House made public today a letter sent by President Harding to Samuel Hill of 814 East Highland Drive, Seattle, in which the President wrote that the record of a century of peace with the British Empire and the fact that there was an unfortified boundary line, extending 3,000 miles between the United States and Canada furnished evidence that the world grows wiser and better.

The letter is to be read at the dedication on Sept. 8 of a peace portal which has been erected on the boundary line between Canada and the United States, near Blaine, Wash., in commemoration of a century of uninterrupted peace with Great Britain. Mr. Hill planned the portal. The letter was dated "The White House, Sept. 2, 1921," and read:

"The ancient Romans erected a temple to Janus, a dispenser of peace and war, and ordered that its gates should never be closed while the nation was at war. In seven centuries they are said to have been closed but three times. You have erected a temple of peace, whose gates are never to be closed save in war. Already it stands for more than a century of unbroken peace between Britain and America, and we all join in the hope that in coming times it may commemorate an era of peace much longer than the period of wars for which the Temple of Janus stood.

"Our century and more of peace with the British Empire; our relations of unbroken amity with Canada; the fact that a boundary line over 3,000 miles long remains unfortified—these are the testimonies that the world grows wiser and better. All mankind looks to this example, yearns to follow it, and we are justified to believe that a time is at hand when it may take a long step in that direction.

"On the occasion of dedication of the Pacific peace portal I wish to convey to you personally my high appreciation of your patriotic service in providing a symbolic shrine to international peace, and in doing so I would also thank the Pacific Highway Association (the builder of the portal) for the fine co-operation it has rendered."

MEXICANS ARRESTED WITH $30,905 IN GOLD

Two and a Young Chauffeur Are Held in Los Angeles on Suspicion of Robbery.

LOS ANGELES, Cal., Sept. 3.—Augustin Autunez, aged 25, who said he was a Mexican customs officer at Tijuana, Lower California, and Romero Breton, aged 25, a clerk in the same office, were arrested here today with $30,905 in United States gold coin in their possession. They and Harry J. Walrip, aged 17, chauffeur, were held on suspicion of robbery.

Autunez, the police said, told them he brought the gold into the United States "for safe keeping." He declared, the police said, that the money had been turned over to him by Francisco Fernandez, Collector of Customs at Tijuana, who, he said, left that place Thursday last when he was informed a warrant for his arrest had been issued at Mexico City. Yesterday, Autunez said, he heard another warrant had been issued for the arrest of himself and Breton. He declared the warrants were the result of a "political movement" and he thought it best to bring the money into the United States.

Patrolman J. L. Ballinger, who arrested Autunez, said the latter had in his pockets an automatic pistol and three railroad tickets for passage from Los Angeles to Chicago by way of Albuquerque.

"Autunez offered me $10,000 in gold to let him go," Ballinger said. "I passed it up, though I had only 60 cents in my clothes."

GUSSMAN BRIDE WOULD ENJOIN INSANITY TEST

Charges Persecution Since Wedding Following Which Priest Was Slain.

BIRMINGHAM, Ala., Sept. 3.—Hearing on the petition of Mrs. Ruth Stephenson Gussman for an injunction to restrain city, county and State authorities from imprisoning her in an asylum, or otherwise interfering with her rights, was continued today by Judge Richard Evans in the Circuit Court until Sept. 20. Testimony in the form of affidavits was ordered submitted.

Mrs. Gussman alleges in her petition that her rights as a citizen are being constantly interfered with and that she believes an effort is under way to have her placed in an institution for the insane at Tuscaloosa on "a fictitious examination."

The petitioner is the bride of Pedro Gussman. Their marriage is said to have been the cause of the killing of Father James E. Coyle, a Catholic priest, by Mrs. Gussman's father, Rev. Edwin R. Stephenson, on Aug. 11.

The daughter appeared as a witness against her father at the preliminary hearing, when Stephenson was bound over without bond to await action by the Grand Jury.

SEES BUSINESS THRIVING.

American Woolen Company's Head Predicts Capacity Operations.

Special to The New York Times.

BOSTON, Sept. 3.—"The American Woolen Company is assured of capacity operations through the Winter," declared President William M. Wood, when interviewed at his Summer home. He has been back only two weeks from a trip to Europe and is highly pleased to find business conditions so satisfactory.

"Our lightweight goods season has been as big a success as I had assumed it would be before going abroad," said Mr. Wood. "Like many manufacturers, we have been pursuing this year a semi-liquidating policy, but on account of our comfortable financial condition we have been under no necessity or pressure to make financial sacrifices.

"Considering that on account of the late Winter opening we shall have the benefit of only ten months' production this year, and in the light of the tremendous losses being registered and absorbed by manufacturing concerns in other lines of trade, I feel well satisfied with the results to date and the anticipated showing for the full year."

"All mills operated by the United States Worsted Company are going at full capacity," declared Myron E. Wood, Treasurer of the company, whose offices are in Boston. "We have a large number of orders on hand, and indications are that our plants will be kept busy for a long time. There is plenty of prosperity in the worsted business."

CHEMISTS' MEETING OPENS HERE TUESDAY

Dyestuffs and Vitamines Among Topics Before American Society.

Dyestuffs, vitamines and many other topics of chemistry are to be discussed this week at the sixty-second annual meeting of the American Chemical Society, which opens in this city on Tuesday and continues until Saturday. Most of the meetings are to be held at Columbia University, but the halls of the College of the City of New York and the Chemists' Club at 52 East Forty-first Street also are to be used.

The first general meeting of the society will be held in the Columbia University gymnasium at 9:30 o'clock on Wednesday morning. In addition to officers of the society, the speakers are to be Francis P. Garvan, President of the Chemical Foundation, who will discuss "Chemistry and the State"; Sir William Pope, who will talk on "Mustard Gas," and Professor R. F. Ruttan, whose topic is "Organisation of Chemical Research in Canada."

The international meeting is to be held in the Great Hall of the City College at 2 o'clock on Thursday afternoon, with nine noted chemists discussing phases of chemistry and the application of the science for the advancement of civilization.

A public meeting also will be held in the Columbia University gymnasium on Saturday night with Dr. Edgar F. Smith, Provost Emeritus of the University of Pennsylvania, delivering the presidential address on "Progress in Chemistry."

The Division of Agricultural and Food Chemistry meets in Havemeyer Hall at Columbia University. Other sections meeting at Columbia are the Section of Sugar Chemistry, the Division of Dye Chemistry, the Division of Organic Chemistry, the Division of Biological Chemistry, the Division of Physical and Inorganic Chemistry, the Section of Leather Chemistry, the Section of Cellulose Chemistry, the Division of Rubber Chemistry, the Section of Chemical Education, the Division of Industrial and Engineering Chemistry the Division of Fertiliser Chemistry, the Section of Petroleum Chemistry, the Division of Water, Sewage and Sanitation and the Division of Chemistry of Medicinal Products.

The Division of Biological Chemistry will hold its symposium on vitamines in Havemeyer Hall at Columbia University at 9:30 o'clock on Thursday morning. Dyes are to be discussed at the same hour in the Mines Building and also on Friday morning.

BATHER GOES TO JAIL; KEEPS HER KNEES BARE

Novelist Says Exposure Is 'None of Atlantic City's Business' Threatens Court Test.

Special to The New York Times.

ATLANTIC CITY, N. J., Sept. 3.—The New Jersey Supreme Court may be called upon to decide whether a municipality has the authority to dictate that fair bathers may not appear on bathing beaches with uncovered knees. Miss Louise Rosine, a novelist, of Los Angeles, and 39 years old, emphatically declared today that it was "none of the city's darn business" whether she "rolled 'em up or down," and is now in the city jail. She has avowed that she will fight her arrest in the court even if it must go to the United States Supreme Court.

Miss Rosine appeared on the Virginia Avenue beach this morning with her stockings rolled below her knees. Beach Policeman Edward Shaw informed her courteously that it was against the regulations here.

"I most certainly will not roll 'em up," she retorted. "The city has no right to tell me how I shall wear my stockings. It is none of their darn business. I will go to jail first."

The policeman then said he would have to take her there. As he took her by the arm she is alleged to have swung a right to the officer's eye which nearly knocked him down. He recovered and blew his whistle. Life guards responded and Miss Rosine was taken to the jail in the patrol.

The officer, his glasses broken and his dignity ruffled, has preferred a charge of assault and battery in addition to disorderly conduct against Miss Rosine.

PRESBYTERIAN SAYS CHURCHES OVERLAP

Protestants Keep Best Men Where Least Needed, Writes Rev. R. F. Jenney.

A severe criticism of Protestant churches is contained in an article in the first issue of The Presbyterian Magazine, to appear next month. The Rev. Ray Freeman Jenney, pastor of Faith Presbyterian Church, [illegible] West Forty-eighth Street, is the author.

"The Protestant churches, as a rule, are like the workman who uses his strongest tools where there is the easiest work to do," writes Mr. Jenney. "They either place or encourage their best-educated and most effective preachers and pastors to accept positions in the amply equipped churches in those parts of the city where the refining influences are most abundant and the needs are proportionately fewer. And on the other hand, where the population is most dense and the needs are greater, they bring to bear their weakest and poorest appliances, both as to leadership and equipment.

"Not only are most of these downtown churches inadequately equipped and manned, but most of them are small in size as well as outlook, and are smuggishly denominational in their point of view. In these downtown sections there are far too many of these weak, struggling sectarian churches, huddled close together, hardly able to walk on their own feet, but amply able to tread on each other's toes, each church trying to save its own life rather than lose it for the sake of the community of which it is a part. This leads to overlapping of work and duplication of efforts, as well as the expenditure of a great deal of money to maintain these separate plants, although inadequately."

WOULD BURY PET CAT BESIDE WIFE'S BODY

Silk-Lined Coffin Is Ready for $10,000 Mausoleum—Scared to Death by a Dog.

Special to The New York Times.

ELIZABETH, N. J., Sept. 3.—Permission to bury his pet cat, "Tiger," beside his wife in a $10,000 mausoleum, is being sought by Edward G. Haskell, a wealthy retired widower of 634 Madison Avenue.

Haskell's pet died of fright late Friday afternoon after being treed by a dog in front of its Madison Avenue home. The cat also was believed to have been affected by the heat. The body of the cat now rests in a silk-lined coffin, where it was viewed by hundreds of children and adults. "Tiger" had been the pet of Haskell for nine years, and he said yesterday that "Tiger" was the only thing left for him to live for."

Immediately after the death of "Tiger," Haskell had the carcass embalmed. He had recently erected a mausoleum for the body of his wife, who died two years ago and contends that the burial vault is his property and that he has the right to place in it whatever pleases him. According to Haskell it was his wife's wish that "Tiger" receive a proper burial. He said that if the cemetery officials refused permission, he would bury the cat in his yard. But would never sell that portion of his property unless a clause be agreed upon that the body should not be removed.

New Fashions and Due Fashions

in the

FRANKLIN SIMON INDIVIDUAL SHOPS
FOR WOMEN AND MISSES

With some observations on Paris Fashions arriving in New York before they have "arrived" in Paris

PARIS and Plymouth Rock have one thing in common—

They are so remote, one in space and one in time, that it is difficult to prevent their being adopted as the birthplace of fashions and of forefathers, by those who have no claim to either.

Personally, in addition to our own organization in Paris, we have at this moment twenty representatives visiting abroad, while our permanent foreign buyers periodically visit us, in the manner of universities exchanging professors.

Thus, when we speak of Paris, we also speak from Paris—we are both the echo and the voice—the record and the singer—*there*, actors in the comedy of fashion—*here*, the playwright of its climaxes.

One really must go to the source of originality for the sauce of originality. And even a Paris origin is not enough. Paris is not infallible. Not all her creations are unmitigated successes. Not every innovation of her designers is an artistic triumph.

That is why the well-groomed woman needs the protection of the Individual Shops, which offer her not merely the fashions which Paris creates, but those which fashionable Paris approves.

Everything, from a gown to a glove, from a chapeau to a shoe, from a peignoir to a perfume laden with the languors of a paradise of flowers—and yet—never a mediocre note anywhere!

Audacities for the daring—simplicities for the young—the unusual for the ultra—frivolities for the light of heart—new nuances of color—new languishments of line—novelty, diversity, quality, and the discrimination which gives vitality to variety.

Originals—or reproductions—made in our own Fifth Avenue workrooms, and so faithfully done that there is nothing to choose between the original and the copy, except the price.

And so far as prices are concerned, you need not be concerned. If we seem to treat them lightly, it is that they are not big enough to talk about.

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